

709	217	Subclass	ISSUE CLASSIFICATION
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PATENT NUMBER
6216158
6216158

U.S. UTILITY PATENT APPLICATION

O.I.P.E. <i>CDG</i>	PATENT DATE
SCANNED <i>CK1</i> O.A. <i>HH</i>	APR 10 2009

SECTOR	CLASS <i>709</i>	SUBCLASS <i>217</i> <i>200</i>	ART UNIT <i>2758</i> <i>2154</i>	EXAMINER <i>Maator</i> <i>Vu</i>
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PREPARED AND APPROVED FOR ISSUE

ISSUING CLASSIFICATION							
ORIGINAL		CROSS REFERENCE(S)					
CLASS	SUBCLASS	CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
<i>709</i>	<i>217</i>	<i>709</i>	<i>219</i>	<i>225</i>	<i>313</i>	<i>329</i>	<i>→</i>
INTERNATIONAL CLASSIFICATION							
<i>G 06 F</i>	<i>13/00</i>						

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<input type="checkbox"/> TERMINAL DISCLAIMER	DRAWINGS			CLAIMS ALLOWED	
	Sheets Drwg. <i>7</i>	Figs. Drwg. <i>7</i>	Print Fig. <i>1</i>	Total Claims <i>20</i>	Print Claim for O.G. <i>1</i>
<input type="checkbox"/> a) The term of this patent subsequent to _____ (date) has been disclaimed.	<i>[Signature]</i> (Assistant Examiner) _____ (Date) _____			NOTICE OF ALLOWANCE MAILED	
<input type="checkbox"/> b) The term of this patent shall not extend beyond the expiration date of U.S. Patent. No. _____				<i>11-21-00</i>	
<input type="checkbox"/> c) The terminal _____ months of this patent have been disclaimed.	<i>VIET D. VU</i> PRIMARY EXAMINER (Primary Examiner) _____ (Date) <i>11-20-00</i>			ISSUE FEE	
				Amount Due <i>\$1,240.00</i>	Date Paid <i>2/20/09</i>
	<i>Brenda Luera</i> (Legal Instruments Examiner) _____ (Date) <i>1/10/09</i>			ISSUE BATCH NUMBER <i>V37</i>	

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Form PTO-436A (Rev. 8/98)

ISSUE FEE IN FILE

(LABEL AREA) Formal Drawings *shts) set*

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PATENT APPLICATION



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INITIALS _____

CONTENTS

	Date received (Incl. C. of M.) or Date Mailed		Date received (Incl. C. of M.) or Date Mailed
1. Application ^{7 pnts.} papers.		42.	
2. Fee - fee, fees	2-10-99	43.	
3. Doc, fee, misc	4-12-99	44.	
4. I.D.S.	4-12-99	45.	
5. Correction	4-12-99	46.	
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10. Response	07-12-00	51.	
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13. Response	04-00	54.	
14. Suppl B	11-5-00	55.	
15. Amend C	11-21-00	56.	
16. Formal Drawings (7 sheets) set	2/20/01	57.	
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ISSUE SLIP STAPLE AREA (for additional cross references)

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O.I.P.E. CLASSIFIER	<i>[Signature]</i>	57	2-4-99
FORMALITY REVIEW	<i>[Signature]</i>	71555	2-10-99

INDEX OF CLAIMS

- ✓ Rejected
- = Allowed
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- I Interference
- A Appeal
- O Objected

Claim	Final	Original	Date
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US006216158B1

(12) **United States Patent**
Luo et al.

(10) **Patent No.:** **US 6,216,158 B1**
(45) **Date of Patent:** **Apr. 10, 2001**

(54) **SYSTEM AND METHOD USING A PALM SIZED COMPUTER TO CONTROL NETWORK DEVICES**

5,923,885 * 7/1999 Johnson et al. 395/712
5,964,836 * 10/1999 Rowe et al. 709/221
5,973,696 * 10/1999 Agranat et al. 345/357

(75) Inventors: **Wenjun Luo**, Fremont; **Elaine P. Lusher**, Pleasanton, both of CA (US)

OTHER PUBLICATIONS

(73) Assignee: **3COM Corporation**, Santa Clara, CA (US)

M.G. Lamming, *Institute for Personalized Information Environment 1994 "Towards Future Personalised Information Environments" Technical Report EPC-1994-104*, Dec. 21, 1993.

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

McCandless, Michael, "The PalmPilot and the Handheld Revolution", IEEE Expert, Nov./Dec. 1997, pp. 6-8.

(21) Appl. No.: **09/237,609**

* cited by examiner

(22) Filed: **Jan. 25, 1999**

Primary Examiner—Viet D. Vu

(51) **Int. Cl.** **G06F 13/00**

(74) *Attorney, Agent, or Firm*—Mark A. Haynes; Haynes & Belfel LLP

(52) **U.S. Cl.** **709/217; 709/219; 709/225; 709/313; 709/329**

(58) **Field of Search** **709/202, 203, 709/217, 219, 223, 225, 230, 250, 313, 319, 328, 329**

(57) **ABSTRACT**

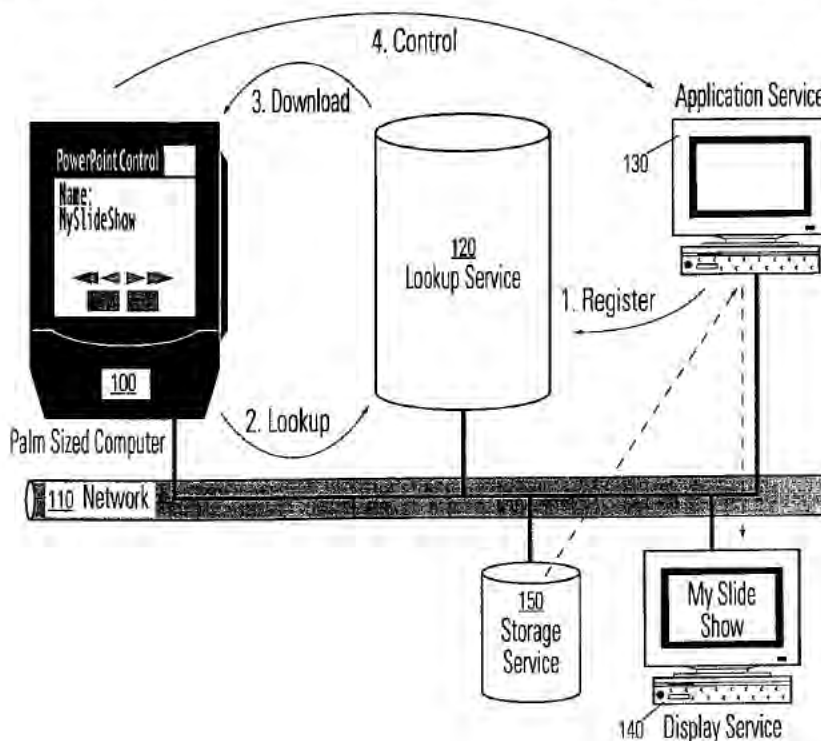
(56) **References Cited**

U.S. PATENT DOCUMENTS

5,564,070 * 10/1996 Wang et al. 455/507
5,790,977 * 8/1998 Ezekiel 702/122
5,832,506 * 11/1998 Kuzma 707/200
5,909,545 * 6/1999 Frese II et al. 709/208

Controlling network services using palm sized computers is described. A program on the palm sized computer is used to access a registry of network services that may be available. The registry includes descriptions for various services. Each description includes at least a reference to program code that can be downloaded to the palm sized computer. Executing this program causes the palm sized computer to issue commands directly to the specific network services needed. In some cases, these network services include application services for running desktop applications that the palm sized computer could not execute.

20 Claims, 7 Drawing Sheets



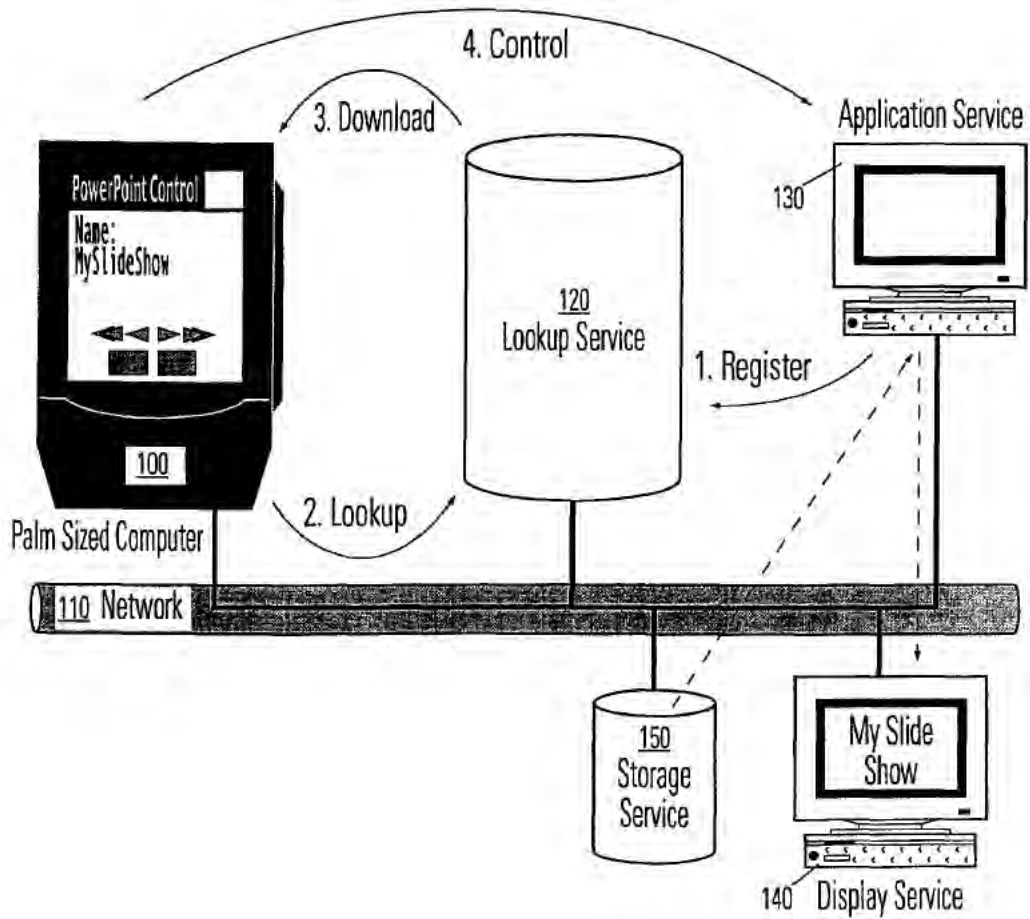


FIG. 1

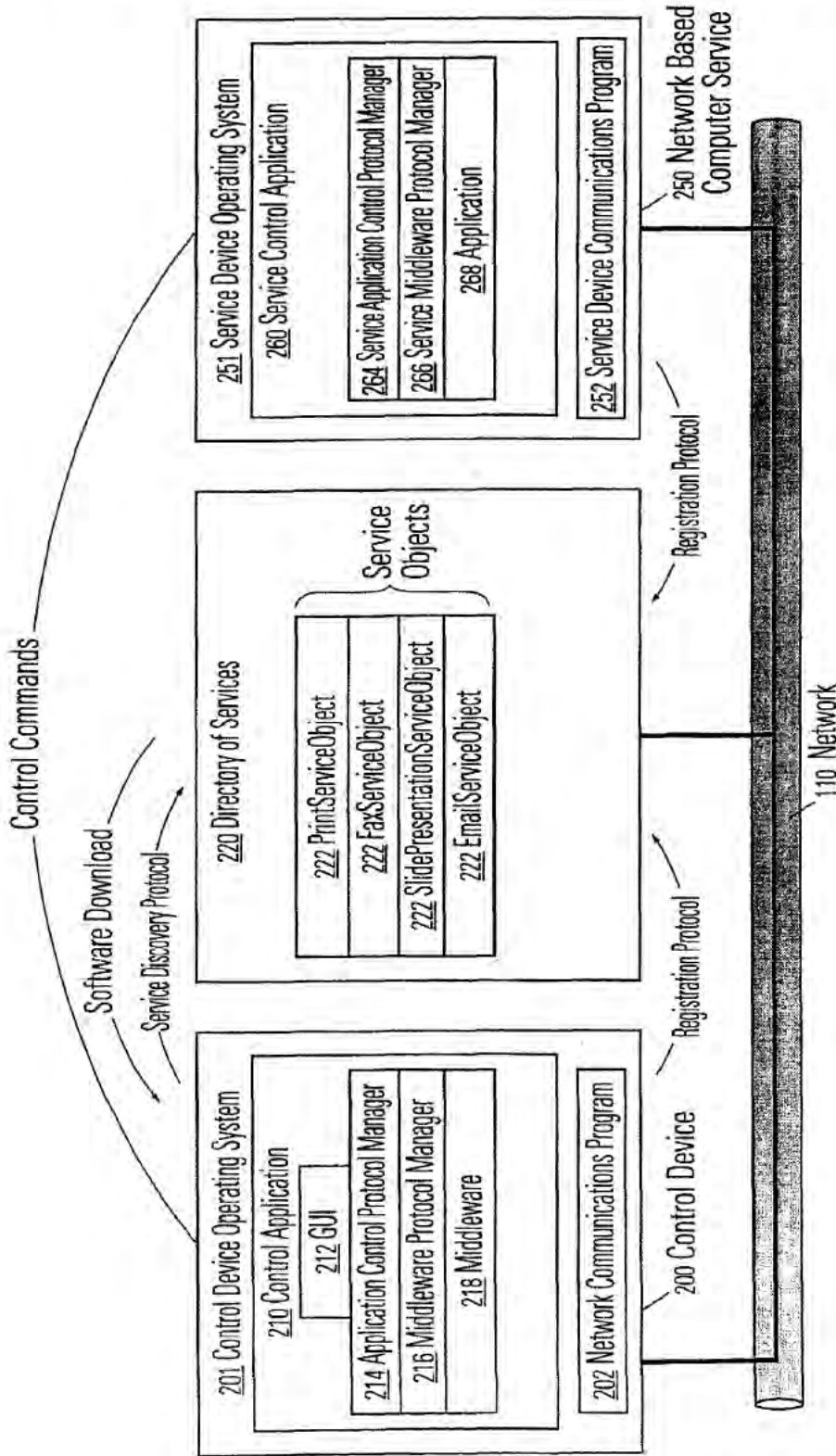


FIG. 2

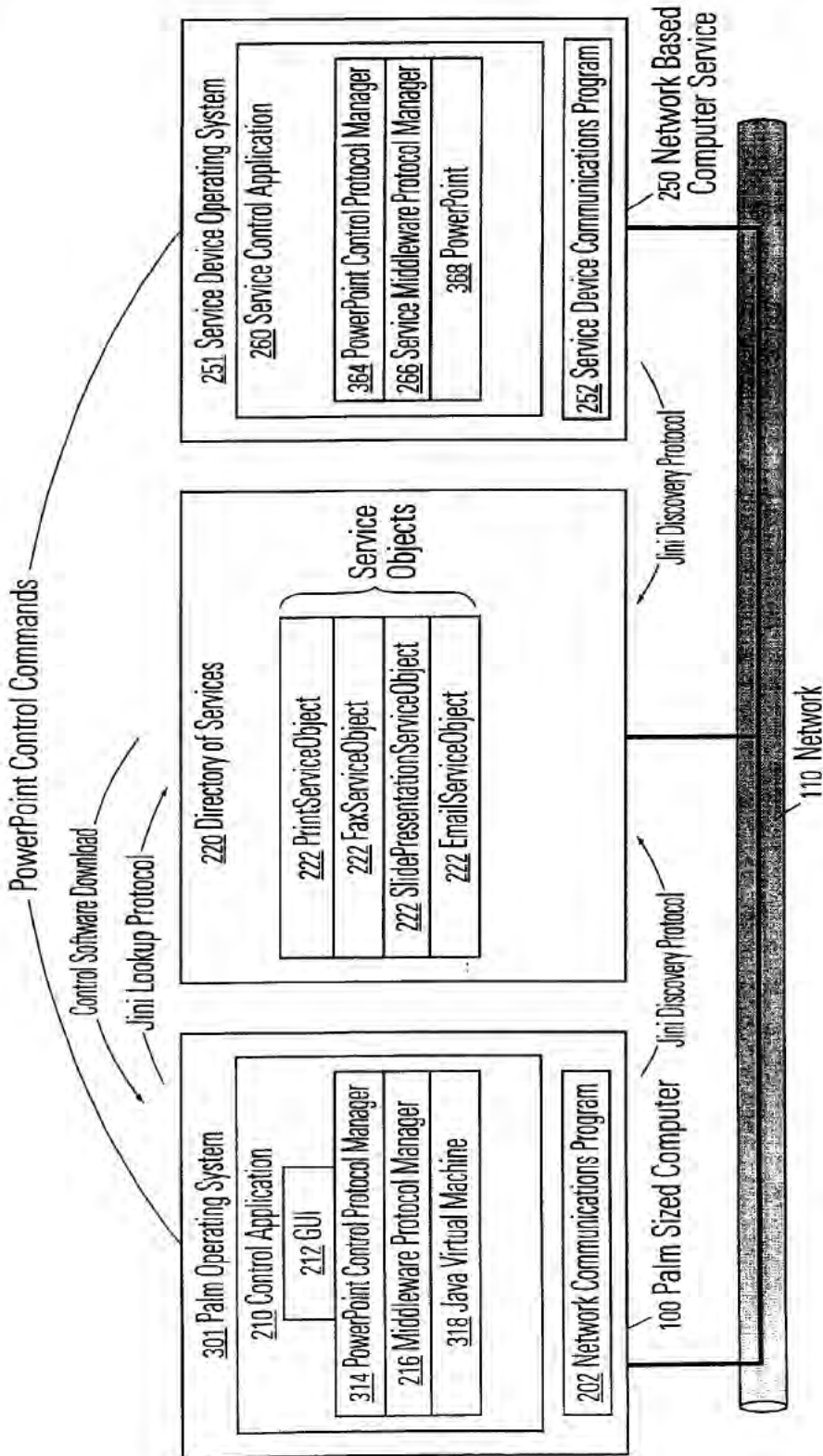


FIG. 3

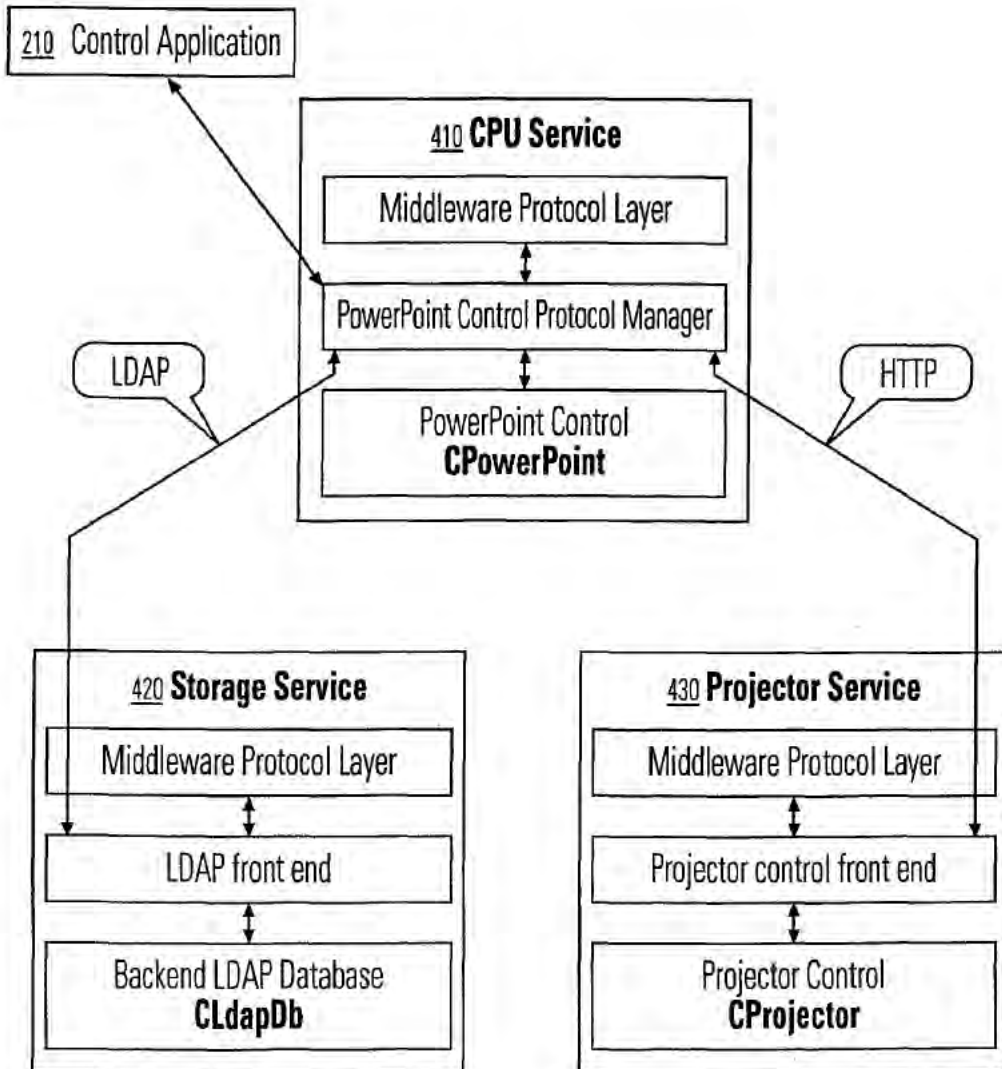


FIG. 4

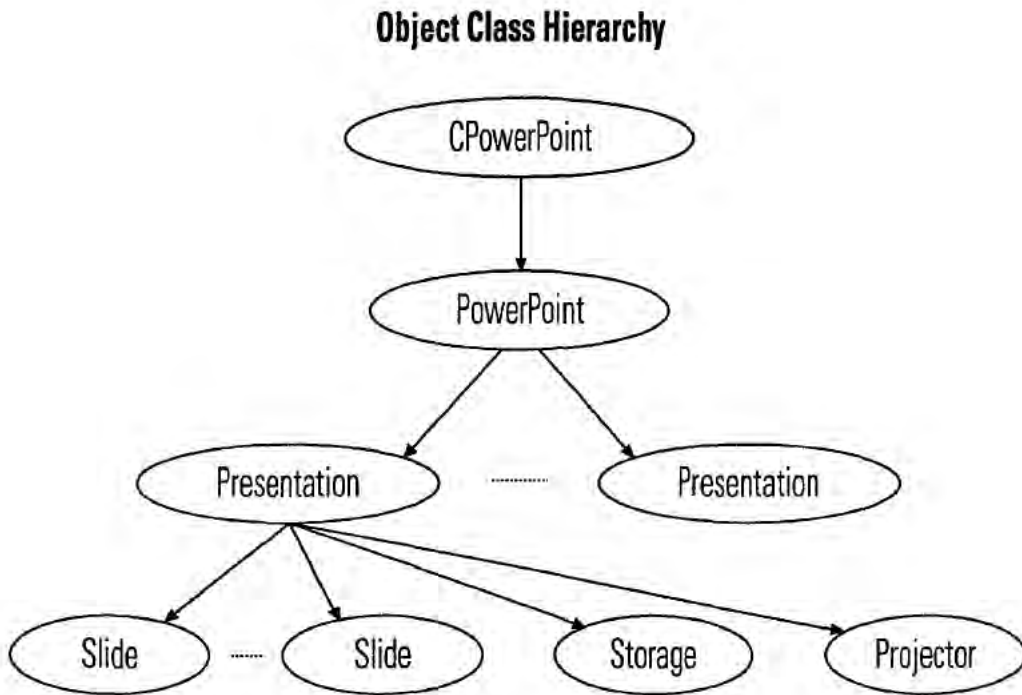


FIG. 5

Object Class Hierarchy for Network Services

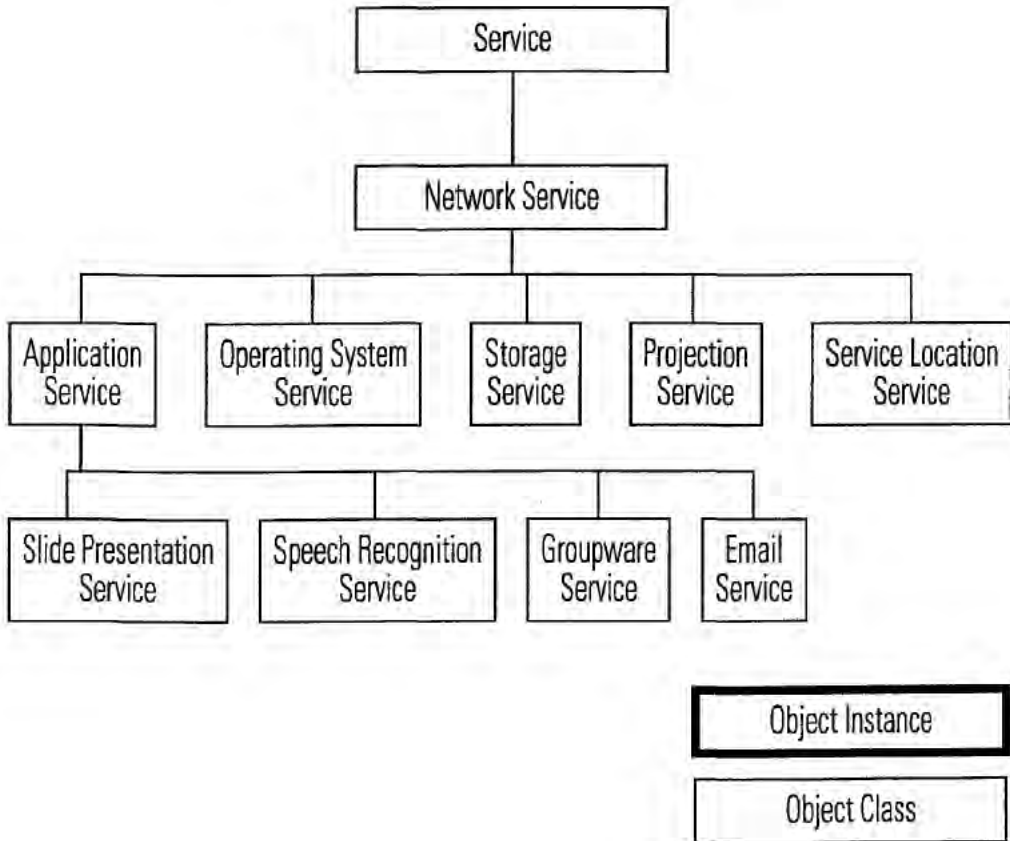


FIG. 6

Object Class Hierarchy for Application Services

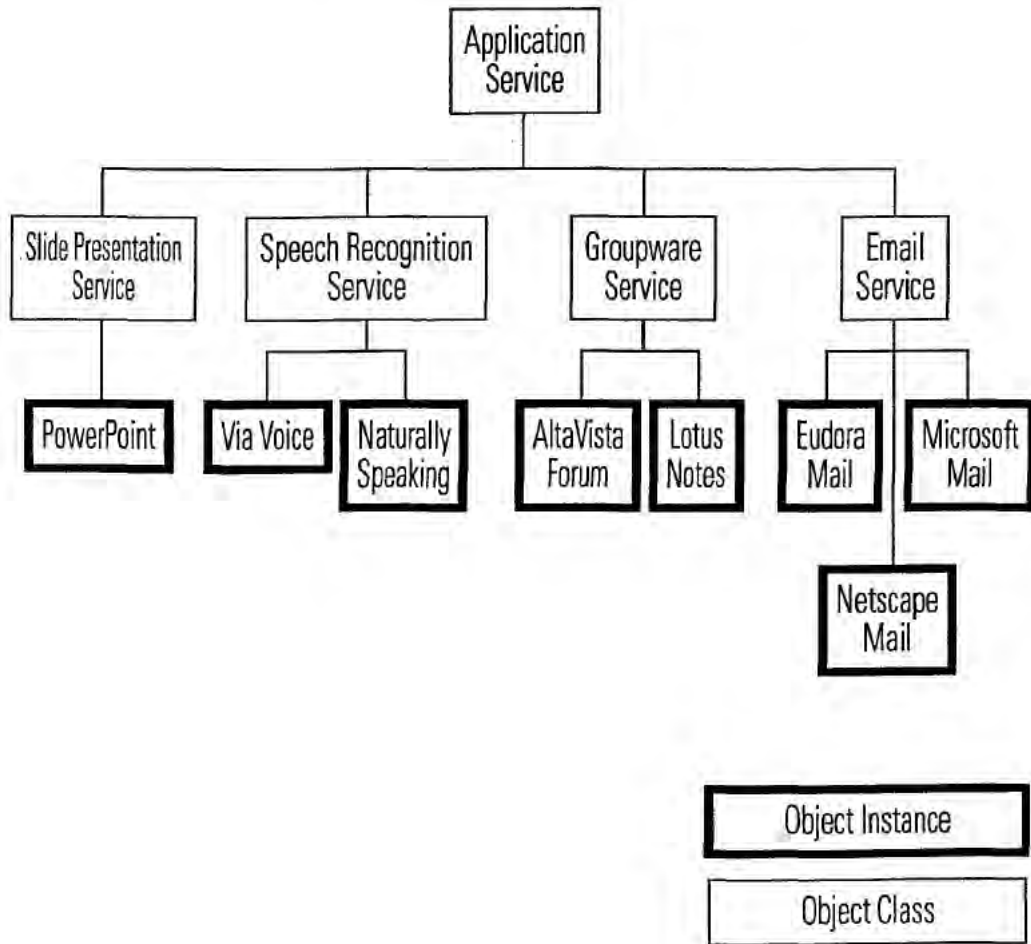


FIG. 7

SYSTEM AND METHOD USING A PALM SIZED COMPUTER TO CONTROL NETWORK DEVICES

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to the field of networked computer. In particular, the invention relates to a system and method to control network devices using a palm sized, or otherwise reduced functionality, computer.

2. Description of the Related Art

Palm sized computers, also referred to as Personal Digital Assistants (PDAs), are portable devices which perform an array of personal management tasks such as calendar management and address book storage. The adoption of palm sized computers has been rapid. Some palm sized computers are able to interface with conventional computing devices, such as PCs, on an as-needed basis. For example, palm sized computers such as 3Com's Palm Platform™ computers can upload personal appointments to a PC-based calendar.

Palm sized computers generally have the following characteristics. Relative to desktop and laptop computers, palm sized computers have limited processing, display and input capabilities. As a result of these limitations, palm sized computers do not run the same applications as desktop or laptop computers. Other limitations of palm sized computers include limited battery life and lower bandwidth communications with other devices.

One big advantage of palm sized computers is their portability. Therefore, it is desirable to be able to access desktop functionality from palm sized computers.

SUMMARY OF THE INVENTION

Controlling network services using palm sized computers is described. A program on the palm sized computer is used to access a registry of network services that may be available. The registry includes descriptions for various services. Each description includes at least a reference to program code that can be downloaded to the palm sized computer. Executing this program causes the palm sized computer to issue commands directly to the specific network services needed. In some cases, these network services include application services for running desktop applications that the palm sized computer could not execute.

In some embodiments, the device executing the network services and the palm sized computer are executing middleware applications for communicating with the registry. In some embodiments, this middleware includes Jini technology from Sun Microsystems. Additionally, the programs downloaded can include Java program code.

BRIEF DESCRIPTION OF THE FIGURES

FIG. 1 illustrates a system having a palm sized computer controlling operations of various network devices.

FIG. 2 illustrates a software architecture for use in the system of FIG. 1.

FIG. 3 illustrates an example architecture for controlling a PowerPoint presentation.

FIG. 4 illustrates a detailed software architecture for the example of FIG. 3.

FIG. 5 illustrates a class hierarchy that can be used in the example of FIG. 3.

FIG. 6 illustrates an example class hierarchy for network services that can be provided in the system of FIG. 1.

FIG. 7 illustrates an example class hierarchy for application services that can be provided in the system of FIG. 1.

DETAILED DESCRIPTION

A. System Overview

A palm sized computer can serve as a network portal to usher in a new generation of mobile computing. Palm sized computers are the ideal next generation computing device in that they are inherently mobile and have the lightweight form factor necessary for mobile computing. The fundamental obstacle to palm sized computers as the next generation computing device can be removed by viewing the network as an extension of the palm sized computer's resources. Functions can be downloaded into the device as needed, and overlaid after they have been used. This allows the palm sized computer to adapt to a changing environment (as the mobile user's location changes) and to access exactly the set of services it needs. These services are stored on the network and can be used at will. Many of these services may never reside on the device and are more suitable for execution by a conventional computer. However, they are accessible and can be controlled via a lightweight computing device, such as a palm sized computer.

B. Building Blocks of Network-Enabled Palm Sized Computers

The building blocks for lightweight mobile computing include a palm sized computer, a compute/memory/storage-intensive device(s), and a network.

Middleware allows palm sized computers to discover network-based computing resources. Once discovered, this middleware provides a mechanism for the palm sized computer to use these resources. This middleware typically includes a directory of resources (or services), a protocol for storing and retrieving from the directory, and mechanisms to transfer software from the directory to a palm sized computer.

Control applications reside on a lightweight computing device, such as a palm sized computer, but manipulate computing services on the network. Control applications assume the use of middleware, such as Sun Microsystems Jini, for access to network-based resources. (Note in some embodiments, the control application is distributed between the palm sized computer and a control proxy server.)

Example Registry and Control Infrastructure: Jini

Jini™ is a technology developed by Sun Microsystems which addresses the problem of computing and network complexity. It eases the burden of accessing services by providing seamless access and automatic registration of network resources. Jini accomplishes this by adopting a model in which devices announce their presence and capabilities to the network, and access the same type of information in order to locate services they wish to use.

The Jini approach relies on Java and a Jini "registry" (i.e. database of services) as the underlying infrastructure. Each device is expected to run a Java Virtual Machine (JVM), or rely on a Jini proxy which runs a JVM on the device's behalf. Key to Java is the idea that software (as well as data) can be dynamically downloaded to a device. The Java model assumes a distributed, network-centric model in which the behavior of a device can be dynamically altered to accommodate changing conditions.

Jini eases network connectivity problems. Jini acts as middleware to access network resources, as it lets devices locate services and download software for those services. Other middleware could be substituted for Jini if it provides discovery and software download for network-based services.

C. Definitions

A control device is a device which runs Jini (or some other discovery and software download technology) and is capable of accessing a wide range of network-centric services, including services which are incapable of running on the control device. The control device is the access device for a wide class of computing services otherwise inaccessible to devices with restricted computing power. 3Com's palm sized computer, the Palm Computing platform, is an example of such a control device. Windows CE compatible devices may also be used.

A control application is as an application that relies on resources located off of the control device (e.g. on a network), but uses a control device to initiate and control the application. The resources are accessed and controlled, but not resident, on the control device. Examples of such compute/memory-intensive services include PowerPoint slide presentations and speech recognition systems. These services can be both invoked and controlled via a control device.

Network-based services can be used by any control device. Services offer a discrete task to the control device. This contrasts with a traditional model in which devices, such as a PC, house the entirety of resources a control device might utilize. Services are fine-grained and represent a distributed set of capabilities residing on a network. Services may or may not be co-located with other services on the same physical device. Services are offered (via a network and a Directory of Services, such as the Jini Lookup) in as small a unit as is justifiable given the application tasks users will typically want to accomplish. Fine-grained services can be used by a variety of consumers who need precisely that function. The model that emerges is a network-based model that offers a wide range of narrowly-defined computing services of interest to a wide range of applications. Services will be physically distributed across devices but accessible via a central repository (e.g. database) of services. This model of distributed computing is inherently scalable in that the set of services offered via the network grows seamlessly as devices "plug in" and announce their capabilities.

D. An Example of the Control Application

To help illustrate the use of a control device and a control application, a PowerPoint slide presentation control is described herein. (FIG. 1 illustrates a generalized view of such an example.) In this example, a palm sized computer 100 accesses network 110 resources (via a Directory of Services, such as the lookup service 120) to locate the elements it requires to remotely control a presentation located on the network. The palm sized computer 100 uses three services to function as a control device to display a PowerPoint presentation:

- an application service 130 (to run PowerPoint)
- a persistent storage service 150 (to store the presentation)
- a display service 140 (to display the presentation images)

Each of these services will have registered with the lookup service 100. A service in this example, is tied to different hardware devices. However, this is not required. Storage, processing, and/or display could be supported by one or more computer systems.

None of these services are resident on the palm sized computer 100. Once the palm sized computer 100 has located the necessary services, it downloads the code required to control those services (using the lookup and download protocols). Middleware, such as Sun's Java/Jini technology, is used to move the code.

The palm sized computer 100 is then capable of directly controlling the services it requires.

In this example, all the devices can communicate on the network 110, however, they need not all be connected to the network in the same way.

Functionally, the devices play the following roles:

- palm sized computer 100: the remote control device
- application services: a set of resources and services, such as compute power and applications
- network 110: the physical medium which connects devices and services
- lookup service 120: a database of network services

E. Architecture

As noted above, the palm sized computer 100 functions as the remote control device for the PowerPoint presentation. It is a multi-function control device in that it can control a host of resources accessible via the network. The palm sized computer 100 accomplishes this via middleware (e.g. Jini) and a generic control protocol capable of issuing control commands to an onboard resource. The palm sized computer 100 implements this control via the software components depicted in FIG. 2. These software components represent a generic architecture for control of any network-based resource using a reduced functionality computer such as a palm sized computer. The software architecture, middleware, and control protocol implement a new model for lightweight mobile computing. This model of lightweight mobile computing is particularly well-served by devices such as a palm sized computer, as they possess the requisite size and portability.

In FIG. 2, the control device 200 is able to control services on the network 110, such as the network based service 250. The directory of services 220 provides the registry functions used to enable the system.

The control device 200 includes a control device operating system 201 which supports a network communications program 202 and a control application 210. The network communications program 202 allows the control device 200 to communicate with other devices on the network. The control application 210 includes the following elements:

- a GUI 212 to display the available network-based services and accept user input
- an application control protocol manager 214 which interfaces between the control device 200 and the network based computer service 250 by requesting tasks from that service (e.g. slide manipulation). This module is responsible for generating the application control protocol to command the selected service,
- a middleware protocol manager 216 to transfer data between the control device 200 and the directory of services 220 (e.g. communication between Palm platform and the Jini Lookup). This module is responsible for generating the syntax necessary to communicate based on the type of middleware being used.

The service device operating system 251 includes a service device communications program 252 and a service control application 260. The service device communications program 252 is responsible for communicating with the network 110. The service control application 260 includes the following components:

- a service application control protocol manager 262 that interfaces between the network based computer service 250 and the control device 200 and accepts control tasks (e.g. slide manipulation) issued from the control device 200. This module is capable of sending back a response (e.g. status) to the control device 200,
- a middleware protocol manager 266 to transfer data between the network based computer service 250 and

the directory service (e.g. communication between the application service 130 and the Jini Lookup). This module is responsible for generating the syntax used to communicate based on the type of middleware being used.

an application 268 to perform functions on the network.

The application 268 can be a desktop application that would not execute on a palm sized computer.

Returning to the specific example of the PowerPoint presentation, FIG. 3 illustrates the architecture that could be used to implement such a system. In FIG. 3, the control device 200 has been replaced with a palm sized computer 100 executing the Palm OS 301. The GUI 212 is specifically for PowerPoint control (see FIG. 1 for an example of such a GUI). The Java Virtual Machine 318 is executing on the palm sized computer 100 and replaces the middleware 218. The middleware protocol manager 216 supports Jini discovery, lookup and download protocols. PowerPoint control commands are issued to the network based computer service 250. The PowerPoint control protocol manager 364 provides the interface for these commands and controls the PowerPoint application 368.

F. Control Flow

The process for accessing and controlling network-based services is described below. The specific implementation control of a PowerPoint Service via a 3Com Palm Computing platform is used as an example. Refer to FIG. 1.

1. Configure a computer hosting the directory of services 220 and connect it to the network 110. For instance, a Jini lookup service is configured to listen at a preset TCP, or UDP, port for service registration or service lookup requests.
2. Establish a network connection from the network based computer service 250 to the network 110.
3. Register the computing service with a directory of services 220. For example, in the Jini model, the computing service initially sends out a multicast packet announcing its presence on the network. Once the directory service 220 receives the packet, it sends a unicast packet back to the announcer. The packet includes an interface (e.g. Java code) for uploading code back to the directory service 220 as well as for searching and downloading code from the directory service 220.
4. Upload service description to the directory service 220. If Jini is adopted as the middleware, the application service 130 receives the response from the directory service 220 and uses the included interface to upload its service interface to the directory service 220. When the service interface is called, it contacts the directory service 220 which in turn creates an entry (represented by an object) for this new service and sets the proper fields such as service name, attributes and optionally the corresponding service interface. Other middleware may choose to use protocol-based approaches such as FTP or TFTP for the uploading process.
5. Register the storage service 150 and display service 140 via the same process.
6. Establish a network connection from the control device 200 to the network 110. For Palm computers, there are multiple options for network connectivity. Possible solutions include using the infrared (IR) port to talk to a IR-LAN bridge or router, using the serial port to talk to a serial-to-LAN bridge or router, using either the IR or the serial port to talk to a digital cell phone and dial up a modem server, and/or using wireless data communications.
7. Launch the service control graphical user interface (GUI) 212 on the control device 200.

8. Via the service control GUI 212, accept user input, such as the selection of an application (for example, a PowerPoint application) to be controlled.
9. Optionally register the control device 200 with the directory service via a registration protocol, such as the Jini Discovery Protocol. This step is the same as the above one for the other services. It is executed only if the control device 200 has resources to offer.
10. Search the directory service 220 and download the desired service descriptor. In the case of Jini, after the control device 200 receives the response from the directory service 220, it uses the included interface to search the directory service 220 for an application service using the object type representing the service (such as an object type of PowerPoint presentation service) and the desired service attributes (such as the name and the physical location of the service). Once the directory service 220 finds such a service entry, the control device 200 is notified, which in turn uses the downloading interface to download the application service descriptor. One example of these services is the GUI code for controlling a PowerPoint presentation.
11. Send requests from the control device 200 to the network based computer service 250 to control the desired application. For example, a "next slide" request could be sent from a palm sized computer 100 to an application service 130 running PowerPoint. The communication can be based on a protocol such as the following one:

Control Type	Application	File Name	Control Function
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Where:

```
Control Type={Request, Reply}
Application={PowerPoint, FAX, Print, Email,
Phonebook, . . . }
File Name={3ComPalmVHSpecification}
Control function={File Load, Slide Forward, Slide
Backward, File Close, . . . }
```

Alternatively, techniques such as Java's Remote Method Invocation (RMI) can be used to achieve the same goal. In this case, the control device makes a local function call such as doForwardSlide(). The RMI mechanism will transfer the call to a remote machine which implements and carries out the function call. The PowerPoint presentation service may in turn use other services such as the storage service 150 and the display service 140. The procedure to employ these services is similar to steps 10-11 above.

12. Accept any response to requests sent from the control device 200 to the network based computer server 250 and process any errors.

G. Control Device GUI

An important element of the control application 210 is a GUI front-end which accepts user input for controlling the PowerPoint presentation (or other application) and a control protocol manager backend which takes user input and translates it into commands to the CPU service. An example GUI is depicted in FIG. 1. The example GUI allows the user to click on "forward", "backward", "go-to-first-page" or "go-to-last-page" buttons to control the slide show. The user can also click a "get-list" button to get a full list of the slide titles in the current presentation and choose to go to a particular slide. By clicking the "scribble" button, the window switches to graphics mode. In this mode, the user can draw at random on the panel, and the result of the drawing will be sent to the CPU service and eventually displayed on the projection service.

As explained in the software flow section, there are multiple ways to implement the application control protocol manager 214, the following illustrates one approach. The protocol takes the following form:

Control Type	Application	File Name	Control Function
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Where:

- Control Type={Request, Reply}
- Application={PowerPoint, FAX, Print, Email, Phonebook, . . . }
- File Name={3CompPalmVIISpecification}
- Control function ={File Load, Slide Forward, Slide Backward, File Close, . . . }

When the user clicks any button or draws something on the GUI, the application control protocol manager 214 generates the corresponding field in the protocol and sends a command to the network based computer service 250 via a TCP/IP channel.

H. Service Control Application Design

FIG. 4 illustrates a detailed software architecture for the service control application of FIG. 3. The architecture includes three main elements: a CPU service 410 (corresponding to the application service 130), a storage service 420 (corresponding to the storage service 150) and a projector service 430 (corresponding to the display service 140). Each of the elements include middleware protocol layer management modules. Each module has a corresponding service application control module (e.g., PowerPoint Control Protocol Manager). To control specific network services, instances of those services are instantiated and are used by the corresponding control protocol manager. The following describes examples of such classes that can be instantiated for specific network services.

PowerPoint Control

The PowerPoint control, through OLE automation, instantiates and controls an instance of PowerPoint application. The PowerPoint control also communicates with the storage service 420 to store/retrieve presentations and the projector service 430 to view slides.

The PowerPoint control has the ability to have many presentations open at the same time and is capable of switching between presentations. A presentation has a collection of slides in it. Once open, the PowerPoint control allows easy traversal of the slides either by commands like previous, next slide or by direct access (e.g. slide number or slide title). When any change in slide position occurs, the PowerPoint application automatically generates the image that needs to be shown by the projector control and invokes the method on the projector control to show the changed slide.

Once a presentation is open, the PowerPoint control can have facilities such as Add Comments and Add Scribbled Graphics to the current slide. Additionally, it can allow the adding of new slides to the presentation.

FIG. 5 illustrates an example object class hierarchy for the PowerPoint control class. The following describes the elements of FIG. 5 in more detail.

Property/Method Name	Type	Description
<u>PowerPoint</u>		
Presentations	Collection	List of open presentations
		<u>Presentation</u>
Slides	Collection	Array of slides in presentation
Location	Storage	Location where presentation loaded from
View	Projector	Projector where presentation is viewed
		<u>Slide</u>
Title	String	Title for the slide
AddComments	Method	Add given comments to slide at given coordinates
AddScribble	Method	Add given graphics to slide at given coordinates
		<u>Storage</u>
Host	String	LDAP Server host where the presentation stored
FileName	String	File name and other details for presentation
		<u>Projector</u>
Host	String	Projector host where slides shown
ShowSlide	Method	Show slide image on projector

LDAP Database Control

The LDAP database control provides file system services to store and retrieve presentations. This control gets commands from the PowerPoint control through the LDAP protocol, to search for presentations and return presentations.

An object class hierarchy for CLdapDB could include CLdapDb having to a specific storage system reference.

<u>Storage</u>		
Property/Method Name	Type	Description
FileFilter	String	File filter used to get file list
FileList	Collection	List of files found on storage

Projector Control

The projector control provides image viewing services and has a simple image viewer that shows the image on a projection screen, monitor, display device or canvas. The control gets commands from the PowerPoint control. Specifically, to display images, the projector control could cause frames generated by the PowerPoint control to be displayed at the device controlled by the projector control. Other embodiments use more sophisticated techniques for displaying the PowerPoint information (e.g., support windowing system API calls that an application may make).

An object class hierarchy for CProjector could include CProjector having to a specific image view reference.

ImageView		
Property/Method Name	Type	Description
FileName	String	File name to be displayed
View	Method	Show the image on the projector
Mode	Long	FullScreen mode

I. Directory of Services Design

The directory of services 220 encodes the set of services available on the network 110. The directory of services 220 describes the characteristics of these services and provides a means to locate those services. To illustrate this concept, an object-oriented directory service is used. The directory service will have objects whose attributes describe the features of available services and optionally include either code to invoke those services or a reference to such code. A directory service will typically be one of several components offered in the middleware a control device 200 will use.

FIG. 6 illustrates an object class hierarchy which models several network-based services. These network-based services are Application Service, Operating System Service, Storage Service, Projection Service, and Service Location Service. Examples of each of these services are now given.

```

Define-Class Service
  Superclass: root
  Attributes:
    Name
    Status
Define-Class NetworkService
  Superclass: Service
  Attributes:
    Location
    PhysicalAddress
    PhysicalMachine
    Owner
    Vendor
    Version
Define-Class ApplicationService
  Superclass: NetworkService
  Attributes:
    CodeLocation
    SerialNumber
    SupportedFeatures
Define-Class OperatingSystemService
  Superclass: NetworkService
  Attributes:
    RealTimeOS?
Define-Class StorageService
  Superclass: NetworkService
  Attributes:
    DatabaseType
    Schema
Define-Class ProjectionService
  Superclass: NetworkService
  Attributes:
    Resolution
Define-Class ServiceLocationService
  Superclass: NetworkService
  Attributes:
    QueryProtocol
    Schema
    
```

FIG. 7 illustrates a partial object class hierarchy which models Application Services, including the PowerPoint Application Service:

```

Define-Class SlidePresentationService
  Superclass: ApplicationService
Define-Class GroupwareService
  Superclass: ApplicationService
Define-Class EmailService
  Superclass: ApplicationService
Define-Class SpeechRecognitionService
  Superclass: ApplicationService
    
```

Based on this object class hierarchy, objects which represent network services can be defined. These objects are stored in a directory of services 220, such as a Jini Lookup. An object to instantiate a SlidePresentationService could look as follows:

```

Make-Instance SlidePresentationService
  Name "PowerPoint"
  Status "Active"
  Location "3Com Intranet"
  PhysicalAddress "Building300.Floor2.Cube323"
  PhysicalMachine "PowerBook G3"
  Owner "Elaine Lusher"
  Vendor "Microsoft"
  Version "98"
  CodeLocation "system/applications/office/powerpoint:"
  SerialNumber "169-43-4666"
  SupportedFeatures "Scribble"
    
```

Other examples of objects which represent application services include:

```

Make-Instance SpeechRecognitionService
  Name "Naturally Speaking"
  Status "Active"
  Location "3Com Intranet"
  PhysicalAddress "Building300.Floor2.Cube100"
  PhysicalMachine "Solaris"
  Owner "Wenjun Luo"
  Vendor "Dragon Systems"
  Version "4.1"
  CodeLocation "system/applications/research/dragonspeech"
  SerialNumber "157-89-4323"
  SupportedFeatures "Dictation for Microsoft Word"
Make-Instance GroupwareService
  Name "Alta Vista Forum"
  Status "Active"
  Location "3Com Intranet"
  PhysicalAddress "Building300.Floor2.Cube220"
  PhysicalMachine "Windows NT"
  Owner "Paul Huard"
  Vendor "Microsoft"
  Version "3.1"
  CodeLocation "http://3Community/code/groupware/latest"
  SerialNumber "444-56-7777"
  SupportedFeatures "Virtual Chat Room"
Make-Instance EmailService
  Name "Netscape Mail"
  Status "Active"
  Location "3Com Intranet"
    
```

PhysicalAddress "Building300.Floor2.Cube300"
 PhysicalMachine "Solaris"
 Owner "Rick Nottingham"
 Vendor "Netscape"
 Version "5.0"
 CodeLocation "http://3Community/code/email/latest"
 SerialNumber "456-34-6786"

If middleware resides on a proxy device (rather than on the control device 200), the control device 200 will need to locate such a proxy service. An Operating System Service class can encode services such as a JVM Service, a Linux Service, or a Jini proxy.

Make-Instance OperatingSystemService

Name "Jini Proxy"
 Status "Active"
 Location "3Com Intranet"
 PhysicalAddress "Building300.Floor2.Cube120"
 PhysicalMachine "Solaris"
 Owner "Rick Nottingham"
 Vendor "Sun"
 Version "5.0"
 RealTimeOS? "no"

Finally, directory services 220 (such as the Jini Lookup) are modeled. This could be encoded in a class such as the Service Location Service.

Make-Instance ServiceLocationService

Name "Jini Lookup"
 Status "Active"
 Location "3Com Intranet"
 PhysicalAddress "Building300.Floor2.Cube150"
 PhysicalMachine "Solaris"
 Owner "Rick Nottingham"
 Vendor "Sun"
 Version "5.0"
 QueryProtocol "Jini Lookup Protocol"
 Schema "Service Directory Schema 1.0"

J. Variations on the Network-based Control Application

Several variations of the general control paradigm can be defined:

The middleware (Jini, in our example) may not be physically resident on the control device 200. In this case, a proxy is used which runs middleware on behalf of the control device 200. Functionally speaking, the same design will still apply. One change to the design can be used to support a modified GUI for the control device. In these embodiments, the GUI program is modified by the proxy device to account for specific limitations of the control device. Also, in some embodiments, the control device may include preset applications that interface directly with the proxy device. Such an architecture would support a limited set of network services but would likely result in very small and lightweight applications on the control device.

The control paradigm is not limited to palm sized computers. Any computing device with restricted computing power could be used as a control device 200 for any network-based resource. Switches, hubs, routers, and other networking devices are candidates for a control device 200. The network-based resources they use could include any service that cannot physically reside on the networking device due to restrictions such as limited memory.

Some embodiments of the invention include only the control device and the programs on the control device; other embodiments include some and/or all of the programs in computer readable media, or in electromagnetic waveforms.

K. Conclusion

The foregoing description of various embodiments of the invention has been presented for purposes of illustration and description. It is not intended to limit the invention to the precise forms disclosed. Many modifications and equivalent arrangements will be apparent.

What is claimed is:

1. A method of controlling a service on a network using a palm sized computer, the palm sized computer being coupled in communications with the network, the method comprising:

- accessing a description of the service from a directory of services, the description of the service including at least a reference to program code for controlling the service;
- downloading the program code to the palm sized computer;
- the palm sized computer executing at least a portion of the program code; and
- sending control commands to the service from the palm sized computer in response to the executing, wherein the service controls an application that cannot be executed on the palm sized computer.

2. The method of claim 1 further comprising registering the service in the directory of services by storing the description of the service in the directory of services.

3. The method of claim 1 wherein the directory of services includes a Jini Lookup directory, wherein the accessing the description includes executing a Jini discovery protocol to locate the Jini Lookup directory and executing a Jini Lookup protocol to retrieve the description of the service.

4. The method of claim 1 wherein the description of the service includes an object reference corresponding to an object representing the service and a set of service attributes including the name of the service and the physical location of the service.

5. The method of claim 1 wherein the program code includes Java code and wherein the palm sized computer is executing a Java Virtual Machine to execute at least a portion of the program code.

6. The method of claim 1 wherein the program code includes code to implement a graphical user interface on the palm sized computer.

7. The method of claim 1 wherein the application includes a desktop program.

8. A method of controlling a program on a network device from a palm sized computer, the computer is not capable of executing the program by itself, the network device and computer being coupled in communications via a network, the method comprising:

- accessing a directory of services, a service in the directory of services corresponding to the program, the description of the service including at least a reference to program code for controlling the service;
- loading the program code;
- issuing control commands to the network device using the program code, the control commands causing the network device to control the program.

9. The method of claim 8, wherein loading the program code includes loading the program code onto the palm sized computer and the issuing the control commands includes the palm sized computer issuing the control commands.

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10. The method of claim 8, wherein a proxy device is coupled to the network and wherein accessing the directory of services includes the palm sized computer accessing the proxy device, and the proxy device accessing the directory of services, and wherein the loading the program code includes loading the program code onto the proxy device, and wherein the issuing the control commands includes the palm sized computer issuing a set of first set of commands to the proxy device and the proxy device issuing the control commands.

11. The method of claim 10, wherein the program code includes a user interface program and wherein the proxy device receives the user interface program and generates a second user interface for the palm sized computer.

12. The method of claim 8 wherein loading the program code includes loading the program code onto the palm sized computer from the directory of services.

13. The method of claim 8, wherein the palm sized computer includes a Palm OS compatible computer, wherein the program code includes Java code and wherein the directory of services includes a Jini directory of services.

14. The method of claim 8 further comprising the network device registering the description of the service with the directory of services.

15. The method of claim 8 wherein the program includes a desktop program.

16. The method of claim 8 wherein the program includes a desktop program and wherein the services controlled include a CPU service for executing the program, a storage service for providing data to the CPU service and a display service for displaying information generated from the CPU service.

17. A system for controlling a network service comprising:

- a network based computer service for controlling an application that cannot executed by a control device;
- a directory of services including a registry of services, each service in the registry of services corresponding to a service on the network;

the control device having a program for sending control commands to the network based computer service, the

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program being loaded onto the control device as a result of locating a reference to the network based computer service in the directory of services;

a network coupled in communications with the network based computer service, the directory of services and the control device;

wherein the control device includes a palm sized computer having an operating system, a network communications program, a protocol program for communicating with the directory of services and wherein the program includes a graphical user interface.

18. The method of claim 17 wherein the network based computer service includes a computer having an operating system, a network communications program, a protocol program for communicating with the directory of services and the application.

19. A method for controlling a service in a network using a palm sized computer, the method comprising:

- accessing a description of a service, the description of the service including at least a reference to program code for controlling the service;
- downloading the program code;
- executing at least a portion of the program code; and
- sending control commands to the service in response to the executing, wherein the service includes a CPU service.

20. A system comprising:

- means for accessing a description of a service, the description of the service including at least a reference to program code for controlling a service;
- means for downloading the program code;
- means for executing at least a portion of the program code; and
- means for sending control commands to the service in response to the means for executing, wherein the service controls an application that cannot be executed on the means for executing.

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ABSTRACT

Controlling network services using palm sized computers is described. A program on the palm sized computer is used to access a registry of network services that may be available. The registry includes descriptions for various services. Each description includes at least a reference to program code that can be downloaded to the palm sized computer. Executing this program causes the palm sized computer to issue commands directly to the specific network services needed. In some cases, these network services include application services for running desktop applications that the palm sized computer could not execute.

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UNITED STATES PATENT APPLICATION

OF

WENJUN LUO

AND

ELAINE P. LUSHER

FOR

**SYSTEM AND METHOD USING A PALM SIZED COMPUTER TO CONTROL
NETWORK DEVICES**

PREPARED BY WILSON SONSINI GOODRICH & ROSATI

BACKGROUND OF THE INVENTION

Field of the Invention

This invention relates to the field of networked computer. In particular, the invention relates to a system and method to control network devices using a palm sized, or
5 otherwise reduced functionality, computer.

Description of the Related Art

Palm sized computers, also referred to as Personal Digital Assistants (PDAs), are portable devices which perform an array of personal management tasks such as calendar
10 management and address book storage. The adoption of palm sized computers has been rapid. Some palm sized computers are able to interface with conventional computing devices, such as PCs, on an as-needed basis. For example, palm sized computers such as 3Com's Palm Platform™ computers can upload personal appointments to a PC-based calendar.

15 Palm sized computers generally have the following characteristics. Relative to desktop and laptop computers, palm sized computers have limited processing, display and input capabilities. As a result of these limitations, palm sized computers do not run the same applications as desktop or laptop computers. Other limitations of palm sized
20 ^{Computers} ~~computer~~ include limited ^{battery} ~~batter~~ life and lower bandwidth communications with other devices.

One big advantage of palm sized computers is their portability. Therefore, it is desirable to be able to access desktop functionality from palm sized computers.

SUMMARY OF THE INVENTION

Controlling network services using palm sized computers is described. A program on the palm sized computer is used to access a registry of network services that may be available. The registry includes descriptions for various services. Each description
5 includes at least a reference to program code that can be downloaded to the palm sized computer. Executing this program causes the palm sized computer to issue commands directly to the specific network services needed. In some cases, these network services include application services for running desktop applications that the palm sized computer could not execute.

10 In some embodiments, the device executing the network services and the palm sized computer are executing middleware ~~application~~ ^{applications} for communicating with the registry. In some embodiments, this middleware includes Jini technology from Sun Microsystems. Additionally, the programs downloaded can include Java program code.

BRIEF DESCRIPTION OF THE FIGURES

Figure 1 illustrates a system having a palm sized computer controlling operations of various network devices.

Figure 2 illustrates a software architecture for use in the system of Figure 1.

5 Figure 3 illustrates an example architecture for controlling a PowerPoint presentation.

Figure 4 illustrates a detailed software architecture for the example of Figure 3.

Figure 5 illustrates a class hierarchy that can be used in the example of Figure 3.

10 Figure 6 illustrates an example class hierarchy for network services that can be provided in the system of Figure 1.

Figure 7 illustrates an example class hierarchy for application services that can be provided in the system of Figure 1.

DETAILED DESCRIPTION

A. System Overview

A palm sized computer can serve as a *network* portal to usher in a new generation of mobile computing. Palm sized computers are the ideal next generation computing device in that they are inherently mobile and have the lightweight form factor necessary for mobile computing. The fundamental obstacle to palm sized computers as the next generation computing device can be removed by viewing the network as an extension of the palm sized computer's resources. Functions can be downloaded into the device as needed, and overlaid after they have been used. This allows the palm sized computer to adapt to a changing environment (as the mobile user's location changes) and to access exactly the set of services it needs. These services are stored on the network and can be used at will. Many of these services may never reside on the device and are more suitable for execution by a conventional computer. However, they are *accessible* and can be *controlled* via a lightweight computing device, such as a palm sized computer.

B. Building Blocks of Network-enabled Palm Sized Computers

The building blocks for lightweight mobile computing include a palm sized computer, a compute/memory/storage-intensive device(s), and a network.

Middleware allows palm sized computers to discover network-based computing resources. Once discovered, this middleware provides a mechanism for the palm sized computer to use these resources. This middleware typically includes a directory of resources (or services), a protocol for storing and retrieving from the directory, and mechanisms to transfer software from the directory to a palm sized computer.

Control applications reside on a lightweight computing device, such as a palm sized computer, but manipulate computing services on the network. Control applications assume the use of middleware, such as Sun Microsystems Jini, for access to network-based resources. (Note in some embodiments, the control application is distributed
5 between the palm sized computer and a control proxy server.)

Example Registry and Control Infrastructure: Jini

Jini™ is a technology developed by Sun Microsystems which addresses the problem of computing and network complexity. It eases the burden of accessing services by providing seamless access and automatic registration of network resources. Jini
10 accomplishes this by adopting a model in which devices announce their presence and capabilities to the network, and access the same type of information in order to locate services they wish to use.

The Jini approach relies on Java and a Jini “registry” (i.e. database of services) as the underlying infrastructure. Each device is expected to run a Java Virtual Machine
15 (JVM), or rely on a Jini proxy which runs a JVM on the device’s behalf. Key to Java is the idea that software (as well as data) can be dynamically downloaded to a device. The Java model assumes a distributed, network-centric model in which the behavior of a device can be dynamically altered to accommodate changing conditions.

Jini eases network connectivity problems. Jini acts as middleware to access
20 network resources, as it lets devices locate services and download software for those services. Other middleware could be substituted for Jini if it provides discovery and software download for network-based services.

C. Definitions

a
A control device is ~~as~~ a device which runs Jini (or some other discovery and software download technology) and is capable of accessing a wide range of network-centric services, including services which are incapable of running on the control device.

5 The control device is the access device for a wide class of computing services otherwise inaccessible to devices with restricted computing power. 3Com's palm sized computer, the Palm Computing platform, is an example of such a control device. Windows CE compatible devices may also be used.

10 A control application is as an application that relies on resources located off of the control device (e.g. on a network), but uses a control device to initiate and control the application. The resources are accessed and controlled, but not resident, on the control device. Examples of such compute/memory-intensive services include PowerPoint slide presentations and speech recognition systems. These services can be both invoked and controlled via a control device.

15 Network-based services (~~rather than devices~~) can be used by any control device. Services offer a discrete task to the control device. This contrasts with a traditional model in which devices, such as a PC, house the entirety of resources a control device might utilize. Services are fine-grained and represent a distributed set of capabilities residing on a network. Services may or may not be co-located with other services on the same
20 physical device. Services are offered (via a network and a Directory of Services, such as the Jini Lookup) in as small a unit as is justifiable given the application tasks users will typically want to accomplish. Fine-grained services can be used by a variety of consumers who need precisely that function. The model that emerges is a network-based model that offers a wide range of narrowly-defined computing services of interest to a wide range of
25 applications. Services will be physically distributed across devices but accessible via a

central repository (e.g. database) of services. This model of distributed computing is inherently scalable in that the set of services offered via the network grows seamlessly as devices "plug in" and announce their capabilities.

D. An Example of the Control Application

A 5 To help illustrate the use of ^a control device and a control application, a PowerPoint slide presentation control ^{is} described herein. (Figure 1 illustrates a generalized view of such an example.) In this example, a palm sized computer 100 accesses network 110 resources (via a Directory of Services, such as the lookup service 120) to locate the elements it requires to remotely control a presentation located on the network. The palm
A
10 sized computer 100 uses three services to function as a control device to display a PowerPoint presentation:

- an application service 130 (to run PowerPoint)
- a persistent storage service 150 (to store the presentation)
- a display service 140 (to display the presentation images)

15 Each of these services will have registered with the lookup service 100. A service in this example, is tied to different hardware devices. However, this is not required. Storage, processing, and/or display could be supported by one or more computer systems.

None of these services are resident on the palm sized computer 100. Once the palm sized computer 100 has located the necessary services, it downloads the code
20 required to *control* those services (using the lookup and download protocols).

Middleware, such as Sun's Java/Jini technology, is used to move the code.

The palm sized computer 100 is then capable of directly controlling the services it requires.

In this example, all the devices can communicate on the network 110, however, they need not all be connected to the network in the same way.

Functionally, the devices play the following roles:

- palm sized computer 100: the remote control device
- 5 • application services: a set of resources and services, such as compute power and applications
- network 110: the physical medium which connects devices and services
- lookup service 120: a database of network services

E. Architecture

10 As noted above, the palm sized computer 100 functions as the remote control device for the PowerPoint presentation. It is a multi-function control device in that it can control a host of resources accessible via the network. The palm sized computer 100 accomplishes this via middleware (e.g. Jini) and a generic control protocol capable of issuing control commands to an offboard resource. The palm sized computer 100
15 implements this control via the software components depicted in Figure 2. These software components represent a generic architecture for *control* of any network-based resource using a reduced functionality computer such as a palm sized computer. The software architecture, middleware, and control protocol implement a new model for lightweight mobile computing. This model of lightweight mobile computing is particularly well-
20 served by devices such as a palm sized computer, as they possess the requisite size and portability.

In Figure 2, the control device 200 is able to control services on the network 110, such as the network based service 250. The directory of services 220 provides the registry functions used to enable the system.

The control device 200 includes a control device operating system 201 which supports a network communications program 202 and a control application 210. The network communications program 202 allows the control device 200 to communicate with other devices on the network. The control application 210 includes the following elements:

- 5 • a GUI 212 to display the available network-based services and accept user input
- an application control protocol manager 214 which interfaces between the control device 200 and the network based computer service 250 by requesting tasks from that service (e.g. slide manipulation). This module is responsible for generating the application control protocol to command the selected service.
- 10 • a middleware protocol manager 216 to transfer data between the control device 200 and the directory of services 220 (e.g. communication between Palm platform and the Jini Lookup). This module is responsible for generating the syntax necessary to communicate based on the type of middleware being used.

The service device operating system 251 includes a service device communications program 252 and a service control application 260. The service device communications program 252 is responsible for communicating with the network 110. The service control application 260 includes the following components:

- 15 • a service application control protocol manager 262 that interfaces between the network based computer service 250 and the control device 200 and accepts control tasks (e.g. slide manipulation) issued from the control device 200. This module is capable of sending back a response (e.g. status) to the control device 200.
- 20 • a middleware protocol manager 266 to transfer data between the network based computer service 250 and the directory service (e.g. communication between the application service 130 and the Jini Lookup). This module is responsible for

generating the syntax used to communicate based on the type of middleware being used.

- an application 268 to perform functions on the network. The application 268 can be a desktop application that would not execute on a palm sized computer.

5 Returning to the specific example of the PowerPoint presentation, Figure 3 illustrates the architecture that could be used to implement such a system. In Figure 3, the control device 200 has been replaced with a palm sized computer 100 executing the Palm OS 301. The GUI 212 is specifically for PowerPoint control (see Figure 1 for an example of such a GUI). The Java Virtual Machine 318 is executing on the palm sized computer
10 100 and replaces the middleware 218. The middleware protocol manager 216 supports Jini discovery, lookup and download protocols. PowerPoint control commands are issued to the network based computer service 250. The PowerPoint control protocol manager 364 provides the interface for these commands and controls the PowerPoint application 368.

F. Control Flow

15 The process for accessing and controlling network-based services is described below. The specific implementation ~~is~~ control of a PowerPoint Service via a 3Com Palm Computing platform is used as an example. *Refer to Figure 1.*

1. Configure a computer hosting the directory of services 220 and connect it to the network 110. For instance, a Jini lookup service is configured to listen at a preset TCP, or UDP, port for service registration or service lookup requests.
20
2. Establish a network connection from the network based computer service 250 to the network 110.
3. Register the computing service with a directory of services 220. For example, in the Jini model, the computing service initially sends out a multicast packet announcing its

presence on the network. Once the directory service 220 receives the packet, it sends a unicast packet back to the announcer. The packet includes an interface (e.g. Java code) for uploading code back to the directory service 220 as well as for searching and downloading code from the directory service 220.

- 5 4. Upload service description to the directory service 220. If Jini is adopted as the middleware, the application service 130 receives the response from the directory service 220 and uses the included interface to upload its service interface to the directory service 220. When the service interface is called, it contacts the directory service 220 which in turn creates an entry (represented by an object) for this new service and sets the proper fields such as service name, attributes and optionally the corresponding service interface. Other middleware may choose to use protocol-based approaches such as FTP or TFTP for the uploading process.
- 10
5. Register the storage service 150 and display service 140 via the same process.
6. Establish a network connection from the control device 200 to the network 110. For Palm computers, there are multiple options for network connectivity. Possible solutions include using the infrared (IR) port to talk to a IR-LAN bridge or router, using the serial port to talk to a serial-to-LAN bridge or router, using either the IR or the serial port to talk to a digital cell phone and dial up a modem server, and/or using wireless data communications.
- 15
7. Launch the service control graphical user interface (GUI) 212 on the control device 200.
8. Via the service control GUI 212, accept user input, such as the selection of an application (for example, a PowerPoint application) to be controlled.
9. Optionally register the control device 200 with the directory service via a registration protocol, such as the Jini Discovery Protocol. This step is the same as the above one
- 20
- 25

for the other services. It is executed only if the control device 200 has resources to offer.

10. Search the directory service 220 and download the desired service descriptor. In the case of Jini, after the control device 200 receives the response from the directory service 220, it uses the included interface to search the directory service 220 for an application service using the object type representing the service (such as an object type of PowerPoint presentation service) and the desired service attributes (such as the name and the physical location of the service). Once the directory service 220 finds such a service entry, the control device 200 is notified, which in turn uses the downloading interface to download the application service descriptor. One example of these services is the GUI code for controlling a PowerPoint presentation.

11. Send requests from the control device 200 to the network based computer service 250 to control the desired application. For example, a "next slide" request could be sent from a palm sized computer 100 to an application service 130 running PowerPoint. The communication can be based on a protocol such as the following one:

Control Type	Application	File Name	Control Function
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Where: Control Type = {Request, Reply}
Application = {PowerPoint, FAX, Print, Email, Phonebook,}
File Name = {3ComPalmVIISpecification}
Control function = {File Load, Slide Forward, Slide Backward, File Close,}

Alternatively, techniques such as Java's Remote Method Invocation (RMI) can be used to achieve the same goal. In this case, the control device makes a local function call such as doForwardSlide(). The RMI mechanism will transfer the call to a remote machine which implements and carries out the function call. The PowerPoint presentation service may in turn use other services such as the storage service 150 and the display service 140. The procedure to employ these services is similar to steps 10-11 above.

12. Accept any response to requests sent from the control device 200 to the network based computer server 250 and process any errors.

G. Control Device GUI

An important element of the control application 210 is a GUI front-end which
5 accepts user input for controlling the PowerPoint presentation (or other application) and a control protocol manager backend which takes user input and translates it into commands to the CPU service. An example GUI is depicted in Figure 1. The example GUI allows the user to click on "forward", "backward", "go-to-first-page" or "go-to-last-page" buttons to control the slide show. The user can also click a "get-list" button to get a full list of the
10 slide titles in the current presentation and choose to go to a particular slide. By clicking the "scribble" button, the window switches to graphics mode. In this mode, the user can draw at random on the panel, and the result of the drawing will be sent to the CPU service and eventually displayed on the projection service.

As explained in the software flow section, there are multiple ways to implement
15 the application control protocol manager 214, the following illustrates one approach. The protocol takes the following form:

Table 140

Control Type	Application	File Name	Control Function
--------------	-------------	-----------	------------------

20 Where:

- Control Type = {Request, Reply}
- Application = {PowerPoint, FAX, Print, Email, Phonebook,}
- File Name = {3ComPalmVIISpecification}
- 25 Control function = {File Load, Slide Forward, Slide Backward, File Close,}

When the user clicks any button or draws something on the GUI, the application control protocol manager 214 generates the corresponding field in the protocol and sends a command to the network based computer service 250 via a TCP/IP channel.

14

H. Service Control Application Design

Figure 4 illustrates a detailed software architecture for the service control application of Figure 3. The architecture includes three main elements: a CPU service 410 (corresponding to the application service 130), a storage service 420 (corresponding to the storage service 150) and a projector service 430 (corresponding to the display service 140). Each of the elements include middleware protocol layer management modules. Each module has a corresponding service application control module (e.g., PowerPoint Control Protocol Manager). To control specific network services, instances of those services are instantiated and are used by the corresponding control protocol manager. The following describes examples of such classes that can be instantiated for specific network services.

PowerPoint Control

The PowerPoint control, through OLE automation, instantiates and controls an instance of PowerPoint application. The PowerPoint control also communicates with the storage service 420 to store/retrieve presentations and the projector service 430 to view slides.

The PowerPoint control has the ability to have many presentations open at the same time and is capable of switching between presentations. A presentation has a collection of slides in it. Once open, the PowerPoint control allows easy traversal of the slides either by commands like previous, next slide or by direct access (e.g. slide number or slide title). When any change in slide position occurs, the PowerPoint application automatically generates the image that needs to be shown by the projector control and invokes the method on the projector control to show the changed slide.

Once a presentation is open, the PowerPoint control can have facilities such as *Add Comments* and *Add Scribbled Graphics* to the current slide. Additionally, it can allow the adding of new slides to the presentation.

Figure 5 illustrates an example object class hierarchy for the PowerPoint control class. The following describes the elements of Figure 5 in more detail.

T, 2160

PowerPoint

Property/Method Name	Type	Description
Presentations	Collection	List of open presentations

Presentation

Property/Method Name	Type	Description
Slides	Collection	Array of slides in presentation
Location	Storage	Location where presentation loaded from
View	Projector	Projector where presentation is viewed

Slide

Property/Method Name	Type	Description
Title	String	Title for the slide
AddComments	Method	Add given comments to slide at given co-ordinates
AddScribble	Method	Add given graphics to slide at given co-ordinates

Storage

Property/Method Name	Type	Description
Host	String	LDAP Server host where the presentation stored
FileName	String	File name and other details for presentation

10

Projector

Property/Method Name	Type	Description
Host	String	Projector host where slides shown
ShowSlide	Method	Show slide image on projector

16

LDAP Database Control

The LDAP database control provides file system services to store and retrieve presentations. This control gets commands from the PowerPoint control through the LDAP protocol, to search for presentations and return presentations.

- 5 An object class hierarchy for CLdapDB could include CLdapDb having to a specific storage system reference.

Storage

Property/Method Name	Type	Description
FileFilter	String	File filter used to get file list
FileList	Collection	List of files found on storage

Projector Control

- 10 The projector control provides image viewing services and has a simple image viewer that shows the image on a projection screen, monitor, display device or canvas. The control gets commands from the PowerPoint control. Specifically, to display images, the projector control could cause frames generated by the PowerPoint control to be displayed at the device controlled by the projector control. Other embodiments use more
- 15 sophisticated techniques for displaying the PowerPoint information (e.g., support windowing system API calls that an application may make).

An object class hierarchy for CProjector could include CProjector having to a specific image view reference.

ImageView

Property/Method Name	Type	Description
FileName	String	File name to be displayed
View	Method	Show the image on the

		projector
Mode	Long	FullScreen mode

I. Directory of Services Design

The directory of services 220 encodes the set of services available on the network 110. The directory of services 220 describes the characteristics of these services and provides a means to locate those services. To illustrate this concept, an object-oriented directory service is used. The directory service will have objects whose attributes describe the features of available services and optionally include either code to invoke those services or a reference to such code. A directory service will typically be one of several components offered in the middleware a control device 200 will use.

Figure 6 illustrates an object class hierarchy which models several network-based services. These network-based services are Application Service, Operating System Service, Storage Service, Projection Service, and Service Location Service. Examples of each of these services are now given.

- 15 Define-Class Service
 - Superclass: root
 - Attributes:
 - Name
 - Status
- 20 Define-Class NetworkService
 - Superclass: Service
 - Attributes:
 - Location
 - PhysicalAddress
 - PhysicalMachine
 - Owner
 - Vendor
 - Version
- 25
- 30 Define-Class ApplicationService
 - Superclass: NetworkService

Attributes:
CodeLocation
SerialNumber
SupportedFeatures

5

Define-Class OperatingSystemService
Superclass: NetworkService
Attributes:
RealTimeOS?

10

Define-Class StorageService
Superclass: NetworkService
Attributes:
DatabaseType
Schema

15

Define-Class ProjectionService
Superclass: NetworkService
Attributes:
Resolution

20

Define-Class ServiceLocationService
Superclass: NetworkService
Attributes:
QueryProtocol
Schema

25

Figure 7 illustrates a partial object class hierarchy which models Application

Services, including the PowerPoint Application Service:

30

Define-Class SlidePresentationService
Superclass: ApplicationService

Define-Class GroupwareService
Superclass: ApplicationService

35

Define-Class EmailService
Superclass: ApplicationService

Define-Class SpeechRecognitionService
Superclass: ApplicationService

40

Based on this object class hierarchy, objects which represent network services can be defined. These objects are stored in a directory of services 220, such as a Jini Lookup.

45

An object to instantiate a SlidePresentationService could look as follows:

Make-Instance SlidePresentationService

Name "PowerPoint"
Status "Active"
5 Location "3Com Intranet"
PhysicalAddress "Building300.Floor2.Cube323"
PhysicalMachine "PowerBook G3"
Owner "Elaine Lusher"
Vendor "Microsoft"
10 Version "98"
CodeLocation "system/applications/office/powerpoint."
SerialNumber "169-43-4666"
SupportedFeatures "Scribble"

15 Other examples of objects which represent application services include:

Make-Instance SpeechRecognitionService

Name "Naturally Speaking"
Status "Active"
20 Location "3Com Intranet"
PhysicalAddress "Building300.Floor2.Cube100"
PhysicalMachine "Solaris"
Owner "Wenjun Luo"
Vendor "Dragon Systems"
25 Version "4.1"
CodeLocation "system/applications/research/dragonspeech"
SerialNumber "157-89-4323"
SupportedFeatures "Dictation for Microsoft Word"

30 Make-Instance GroupwareService

Name "Alta Vista Forum"
Status "Active"
Location "3Com Intranet"
PhysicalAddress "Building300.Floor2.Cube220"
35 PhysicalMachine "Windows NT"
Owner "Paul Huard"
Vendor "Microsoft"
Version "3.1"
CodeLocation "http://3Community/code/groupware/latest.
40 SerialNumber "444-56-7777"
SupportedFeatures "Virtual Chat Room"

Make-Instance EmailService

Name "Netscape Mail"
45 Status "Active"
Location "3Com Intranet"
PhysicalAddress "Building300.Floor2.Cube300"
PhysicalMachine "Solaris"

Owner "Rick Nottingham"
Vendor "Netscape"
Version "5.0"
CodeLocation "http://3Community/code/email/latest
5 SerialNumber "456-34-6786"

If middleware resides on a proxy device (rather than on the control device 200), the control device 200 will need to locate such a proxy service. An Operating System Service class can encode services such as a JVM Service, a Linux Service, or a Jini proxy.

10 Make-Instance OperatingSystemService

Name "Jini Proxy"
Status "Active"
Location "3Com Intranet"
15 PhysicalAddress "Building300.Floor2.Cube120"
PhysicalMachine "Solaris"
Owner "Rick Nottingham"
Vendor "Sun"
Version "5.0"
20 RealTimeOS? "no"

Finally, directory services 220 (such as the Jini Lookup) are modeled. This could be encoded in a class such as the Service Location Service.

25 Make-Instance ServiceLocationService

Name "Jini Lookup"
Status "Active"
Location "3Com Intranet"
30 PhysicalAddress "Building300.Floor2.Cube150"
PhysicalMachine "Solaris"
Owner "Rick Nottingham"
Vendor "Sun"
Version "5.0"
QueryProtocol "Jini Lookup Protocol"
35 Schema "Service Directory Schema 1.0"

J. Variations on the Network-based Control Application

Several variations of the general control paradigm can be defined:

- The middleware (Jini, in our example) may not be physically resident on the control device 200. In this case, a proxy is used which runs middleware on behalf of the

CLAIMS

What is claimed is:

- 1 1. A method of controlling a service on a network using a palm sized computer, the
2 palm sized computer being coupled in communications with the network, the
3 method comprising:
4 accessing a description of the service from a directory of services, the description
5 of the service including at least a reference to program code for controlling the
6 service;
7 downloading the program code to the palm sized computer;
8 the palm sized computer executing at least a portion of the program code; and
9 sending control commands to the service from the palm sized computer in response
10 to the executing, wherein the service controls an application that cannot be
11 executed on the palm sized computer.
- 1 2. The method of claim 1 further comprising registering the service in the directory of
2 services by storing the description of the service in the directory of services.
- 1 3. The method of claim 1 wherein the directory of services includes a Jini Lookup
2 directory, wherein the accessing the description includes executing a Jini discovery
3 protocol to locate the Jini Lookup directory and executing a Jini Lookup protocol
4 to retrieve the description of the service.
- 1 4. The method of claim 1 wherein the description of the service includes an object
2 reference corresponding to an object representing the service and a set of service
3 attributes including the name of the service and the physical location of the service.

1 5. The method of claim 1 wherein the program code includes Java code and wherein
2 the palm sized computer is executing a Java Virtual Machine to execute at least a
3 portion of the program code.

1 6. The method of claim 1 wherein the program code includes code to implement a
2 graphical user interface on the palm sized computer.

1 7. The method of claim 1 wherein the application includes a desktop program.

1 8. A method of controlling a program on a network device from a computer, the
2 computer is not capable of executing the program by itself, the network device and
3 computer being coupled in communications via a network, the method comprising:
4 accessing a directory of services, a service in the directory of services
5 corresponding to the program, the description of the service including at least a
6 reference to program code for controlling the service;
7 loading the program code;
8 issuing control commands to the network device using the program code, the
9 control commands causing the network device to control the program.

1 9. The method of claim 8 wherein loading the program code includes loading the
2 program code onto the computer and the issuing the control commands includes
3 the computer issuing the control commands.

1 10. The method of claim 8 wherein a proxy device is coupled to the network and
2 wherein accessing the directory of services includes the computer accessing the
3 proxy device, and the proxy device accessing the directory of services, and
4 wherein the loading the program code includes loading the program code onto the
5 proxy device, and wherein the issuing the control commands includes the computer
6 issuing a set of first set of commands to the proxy device and the proxy device
7 issuing the control commands.

- 1 11. The method of claim 10 wherein the program code includes a user interface
 2 program and wherein the proxy device receives the user interface program and
 3 generates a second user interface for the computer.
- 1 12. The method of claim 8 wherein loading the program code includes loading the
 2 program code onto the computer from the directory of services.
- 1 13. The method of claim 8 wherein the computer includes a Palm OS compatible
 2 computer, wherein the program code includes Java code and wherein the directory
 3 of services includes a Jini directory of services.
- 1 14. The method of claim 8 further comprising the network device registering the
 2 description of the service with the directory of services.
- 1 15. The method of claim 8 wherein the program includes a desktop program.
- 1 16. The method of claim 8 wherein the program includes a desktop program and
 2 wherein the services controlled include a CPU service for executing the program, a
 3 storage service for providing data to the CPU service and a display service for
 4 displaying information generated from the CPU service.
17. A system for controlling a network service comprising:
 3 a network based computer service for controlling an application that cannot be
 4 executed by the control device;
 5 a directory of services including a registry of services, each service in the registry
 6 of services corresponding to a service on the network;
 7 a control device having a program for sending control commands to the network
 8 based computer service, the program being loaded onto the control device as a
 9 result of locating a reference to the network based computer service in the
 directory of services;

10

a network coupled in communications with the network based computer service,

11

the directory of services and the control device.

1

18. The method of claim 17 wherein the control device includes a palm sized computer

2

having an operating system, a network communications program, a protocol

3

program for communicating with the directory of services and wherein the

4

program includes a graphical user interface.

1

18
19.

The method of claim 17 wherein the network based computer service includes a

2

computer having an operating system, a network communications program, a

3

protocol program for communicating with the directory of services and the

4

application.

1

20. A method for controlling a service in a network using a computer, the method

2

comprising:

3

accessing a description of a service, the description of the service including at least

4

a reference to program code for controlling the service;

5

downloading the program code;

6

executing at least a portion of the program code; and

7

sending control commands to the service in response to the executing, wherein the

8

service includes a CPU service.

1

20
21.

A system comprising:

2

means for accessing a description of a service, the description of the service

3

including at least a reference to program code for controlling a service;

4

means for downloading the program code;

5

means for executing at least a portion of the program code; and

26



PATENT
Attorney Docket No. 15886-318

**COMBINED DECLARATION AND POWER OF ATTORNEY
FOR UTILITY PATENT APPLICATION**

As a below-named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**SYSTEM AND METHOD USING A PALM SIZED COMPUTER
TO CONTROL NETWORK DEVICES**

the specification of which

_____ is attached hereto.

X was filed on 25 January 1999 as Application No. 09/237,609
and was amended on * _____
(If Applicable)

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 acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a) which states in relevant part: "Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section....The duty to disclose all information known to be material to patentability is deemed to be satisfied if all information known to be material to patentability of any claim issued in a patent was cited by the Office or submitted to the Office in the manner prescribed by §§ 1.97(b)-(d) and 1.98."

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate as indicated below and have also identified below any foreign application for patent or inventor's certificate on this invention having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)			<u>Priority Claimed</u>	
_____	_____	_____	_____	_____
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No
_____	_____	_____	_____	_____
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s), and under §119(e) of any United States provisional application(s), listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulation, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

_____	_____	_____
(Application Serial No.)	(Filing Date)	(Patented, Pending, Abandoned)
_____	_____	_____
(Application Serial No.)	(Filing Date)	(Patented, Pending, Abandoned)

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith, and to file, prosecute and to transact all business in connection with international applications directed to said invention:

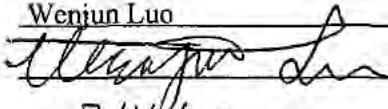
Paul Davis	29,294
John J. Bruckner	35,816
Charles C. Cary	36,764
Michael J. Murphy	37,404
David J. Weitz	38,362
Kent R. Richardson	39,443
David J. Abraham	39,554
U.P. Peter Eng	39,666
George A. Willman	41,378
Henry J. Groth	39,696
Steven J. Benerofe	41,613
Travis L. Dodd	42,491
Jinntung Su	42,174
Hayward A. Verdun	43,223
Van Mahamedi	42,828
Shantanu Basu	43,318
Jeffrey Wheeler	39,066

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Direct all telephone calls to Kent R. Richardson at (650) 493-9300.

I hereby 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 Title 18, United States Code, §1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor: Wenjun Luo
Inventor's signature: 
Date: 3/11/99
Citizenship: China
Residence: 40664 Witherspoon Terrace, Fremont, CA 94538
Post Office Address: Same as above.

Full name of second joint inventor, if any: Elaine P. Lusher
Inventor's signature: _____
Date: _____
Citizenship: United States
Residence: 456 Montori Court, Pleasanton, CA 94566
Post Office Address: Same as above.

→ over

655210-6094260

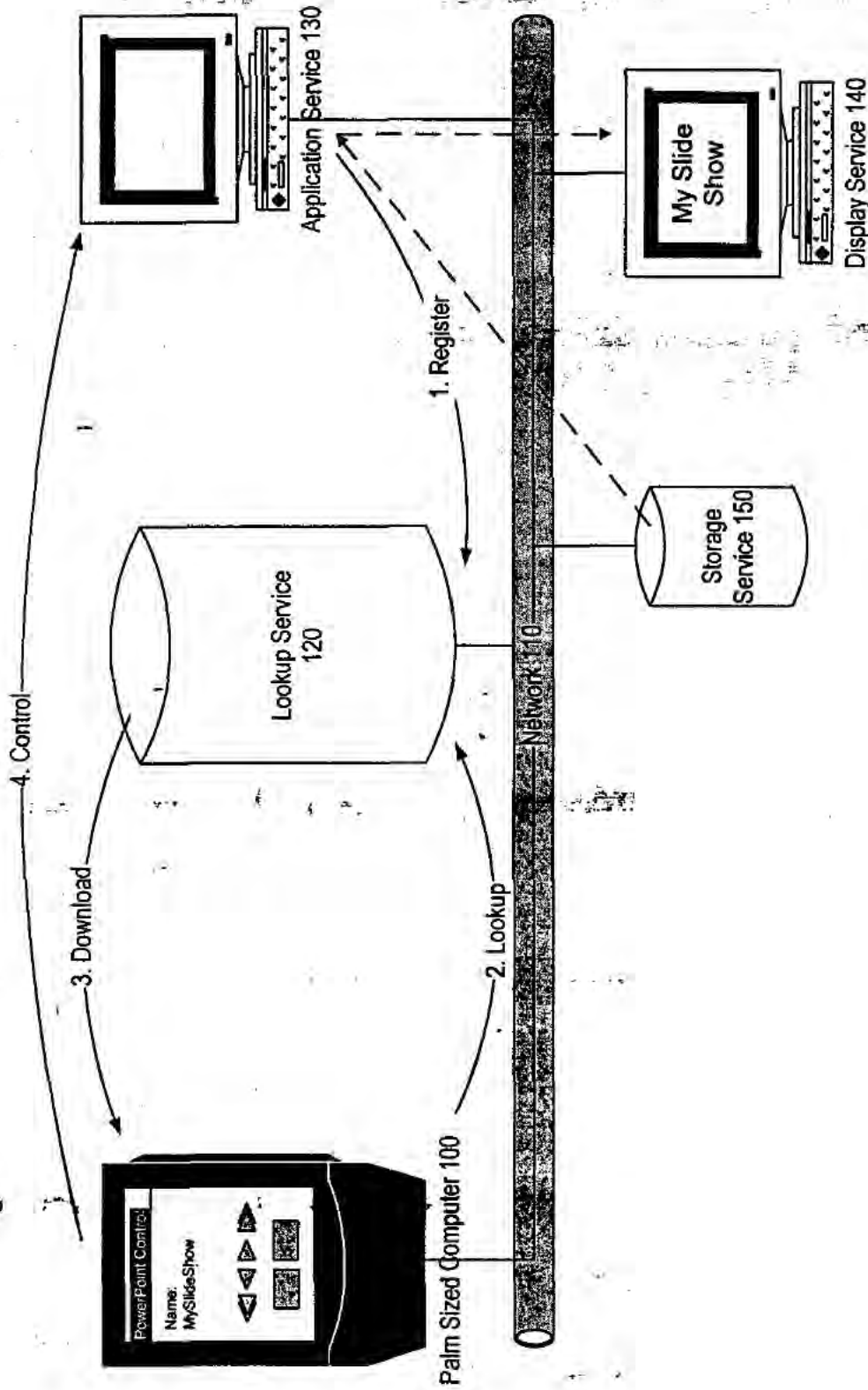


Figure 1

55210" 500/2260

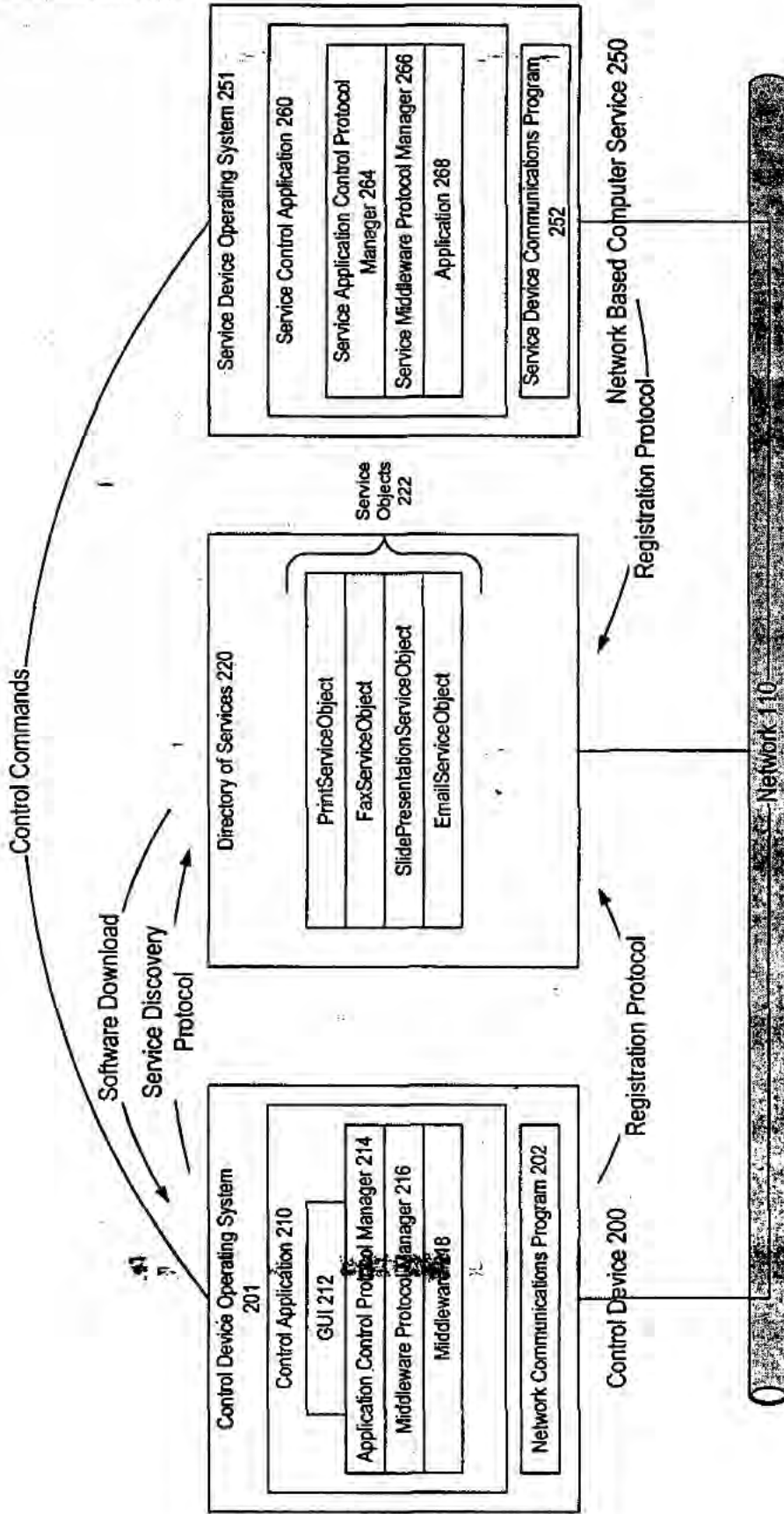


Figure 2

5552701 60028260

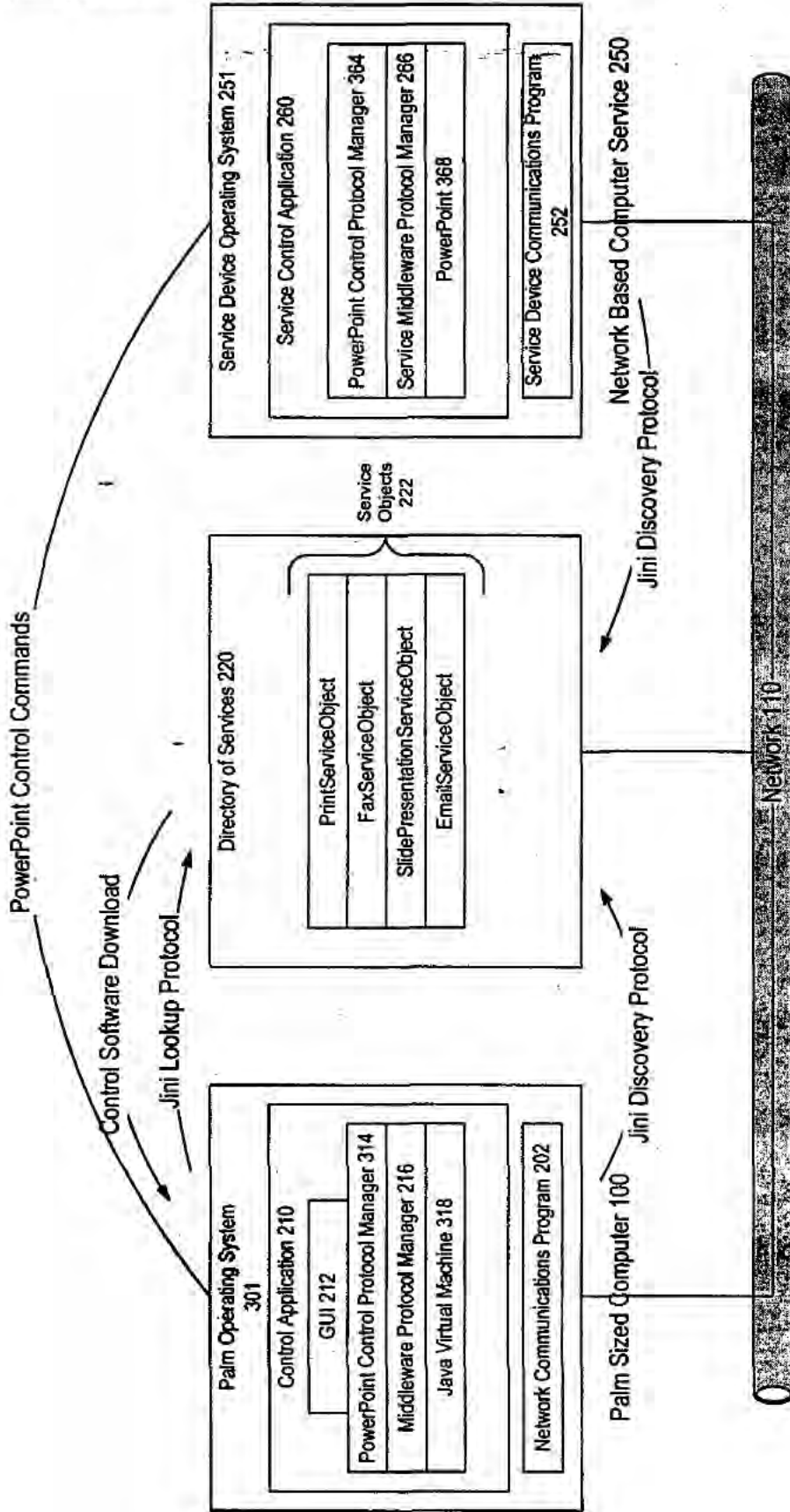


Figure 3

H:\PRIVATE\CLIENT\15886 3COM\318 Palm Sized Network Management Device and System\Fig 03 Example.vsd

05/27/2005 10:15:30

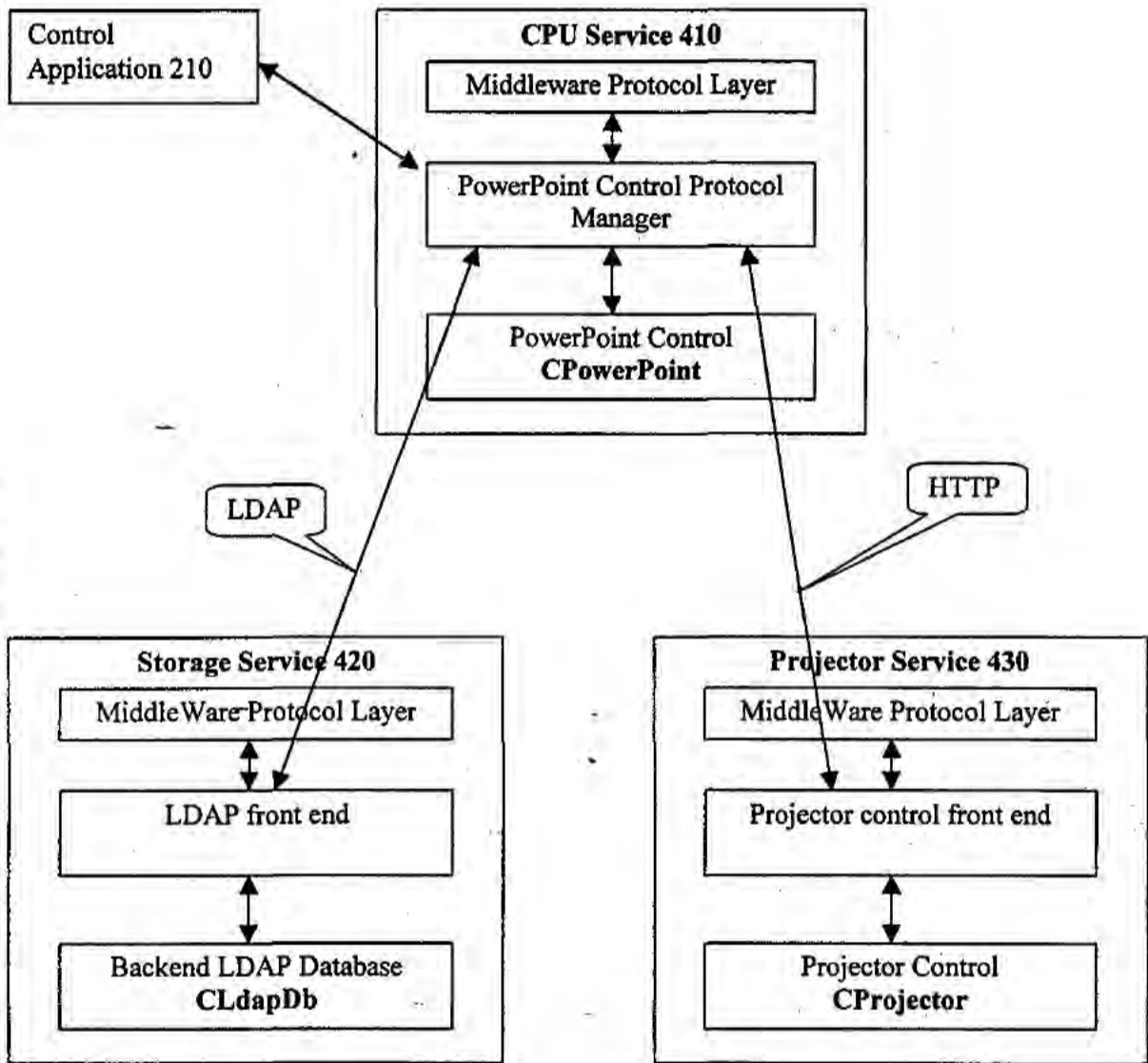


Figure 4

55570" 609/5260

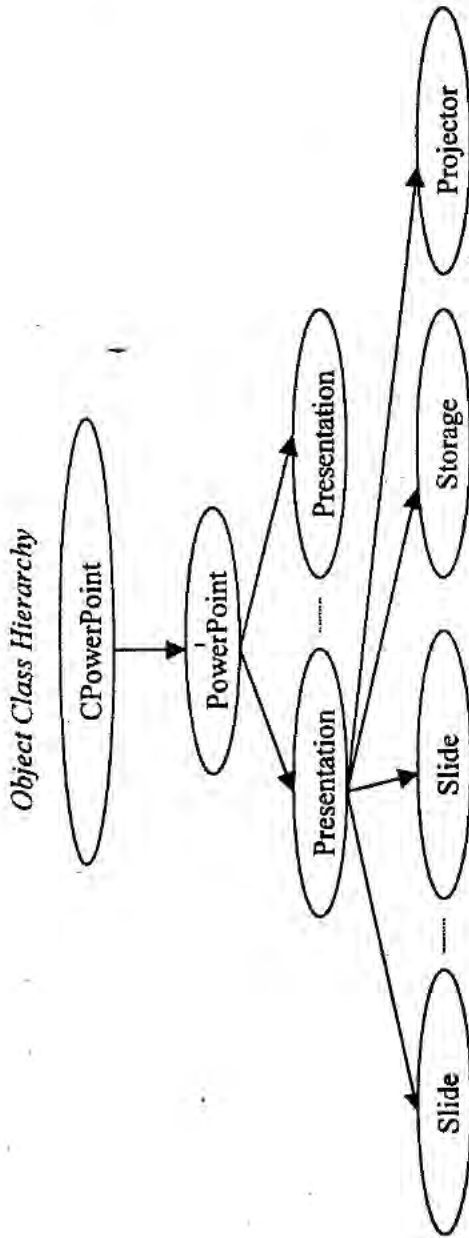


Figure 5

SECTION 50000000

Object Class Hierarchy for Network Services

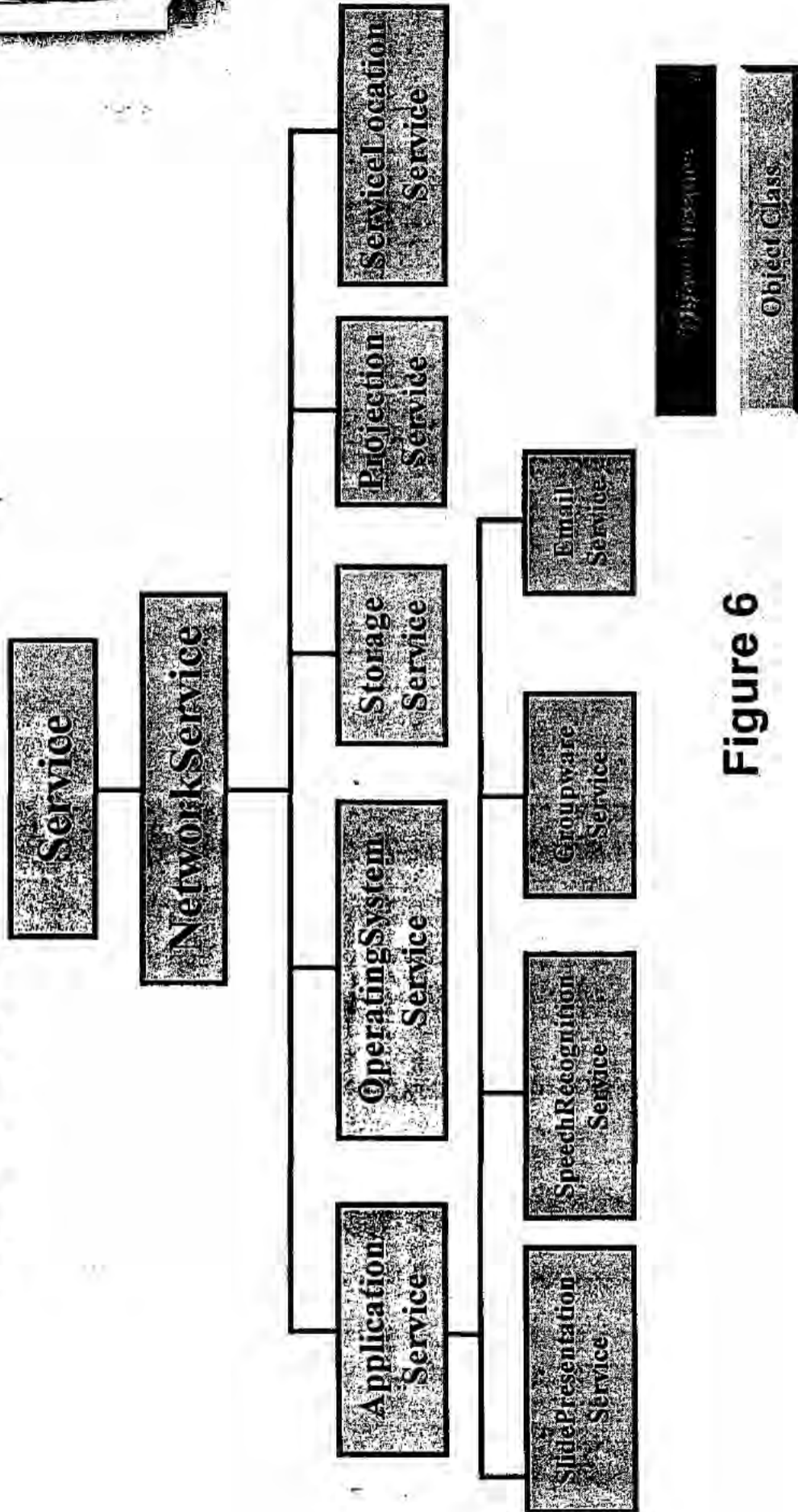


Figure 6

ASSET TO BE SOLD

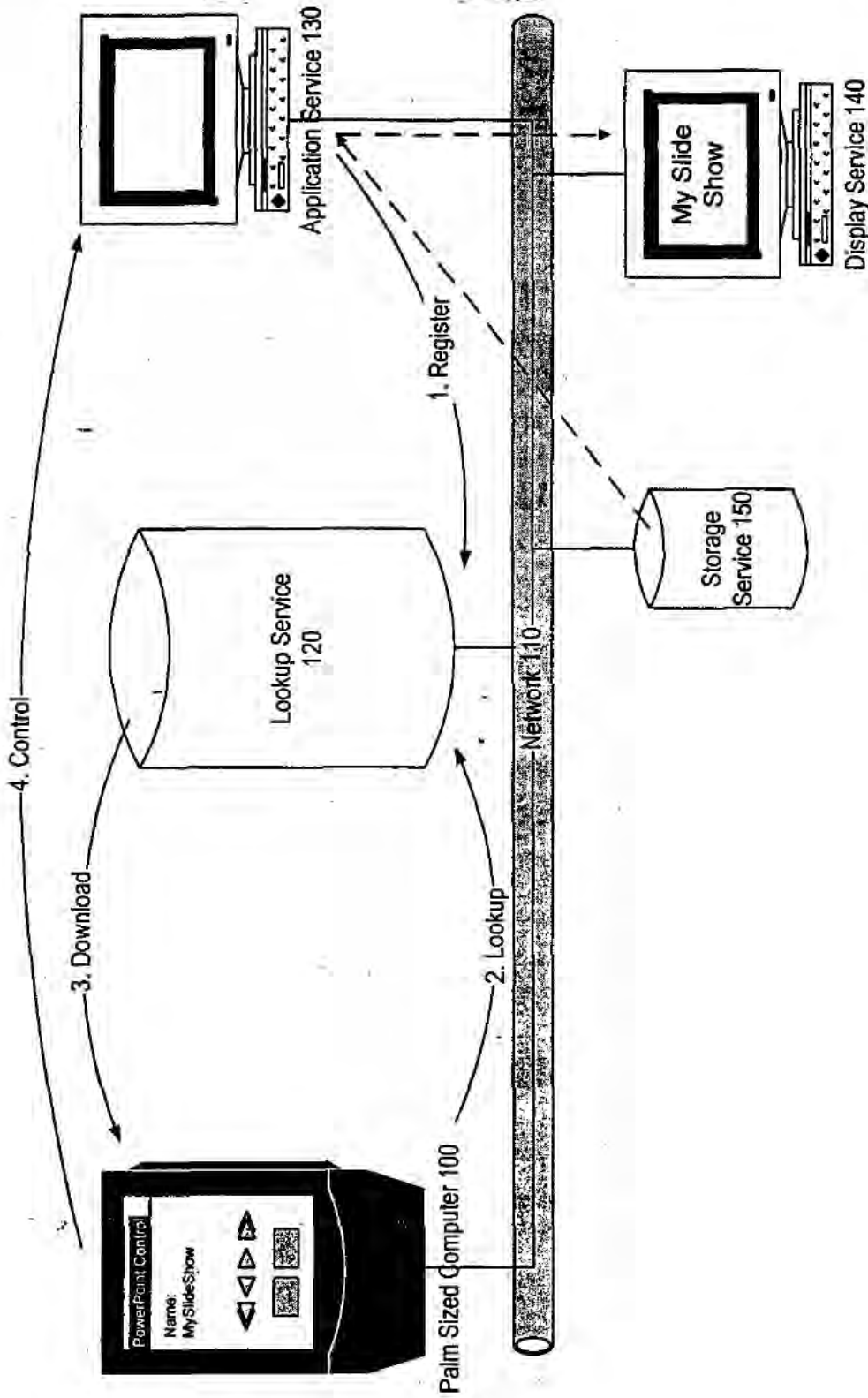


Figure 1

H:\PRIVATE\CLIENT\15988_3\COM\318 Palm Sized Network Management Device and System\Fig 01 System.ved

SECRET 600 450

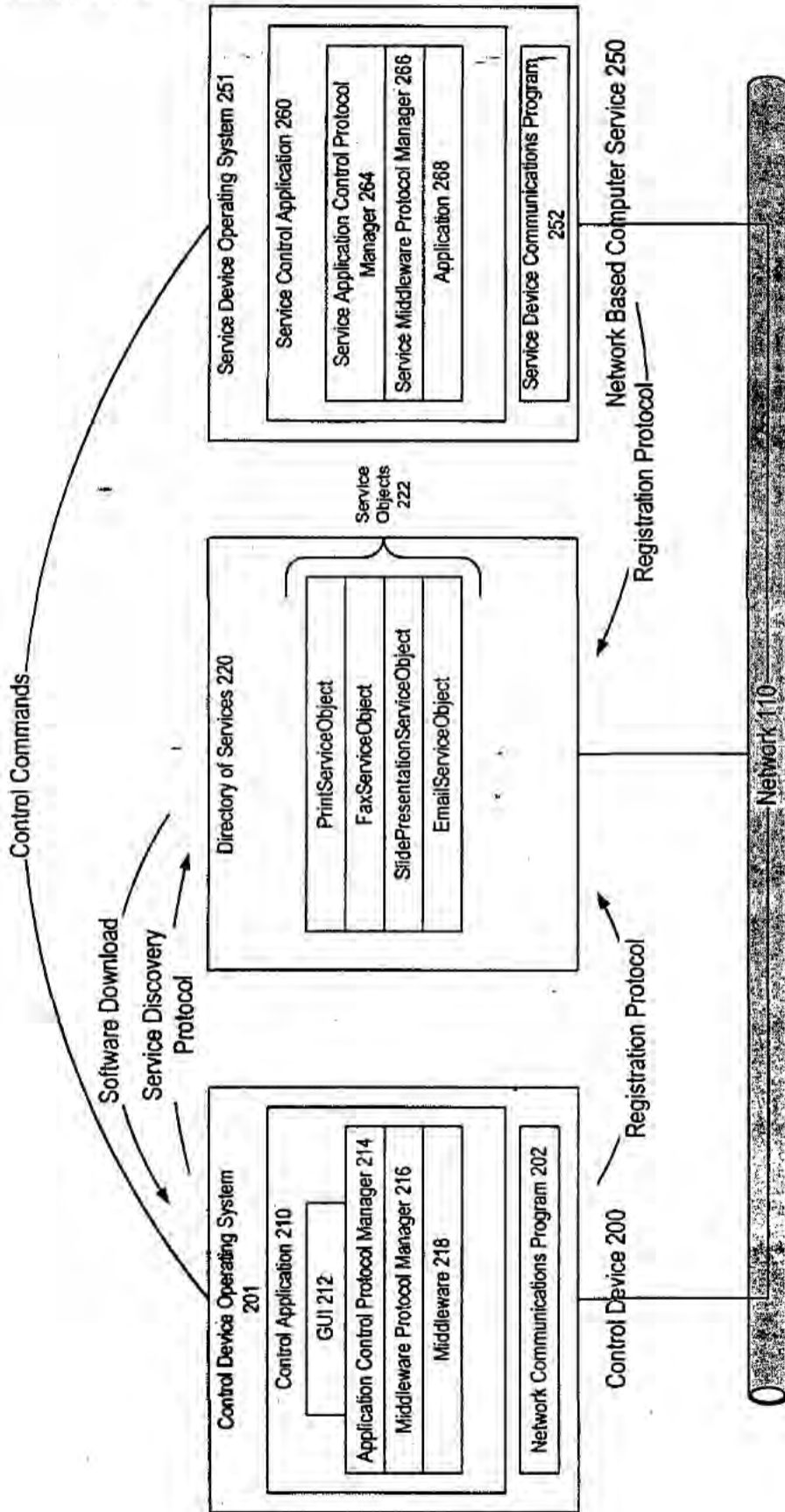


Figure 2

EXHIBIT 1002-1002-0000

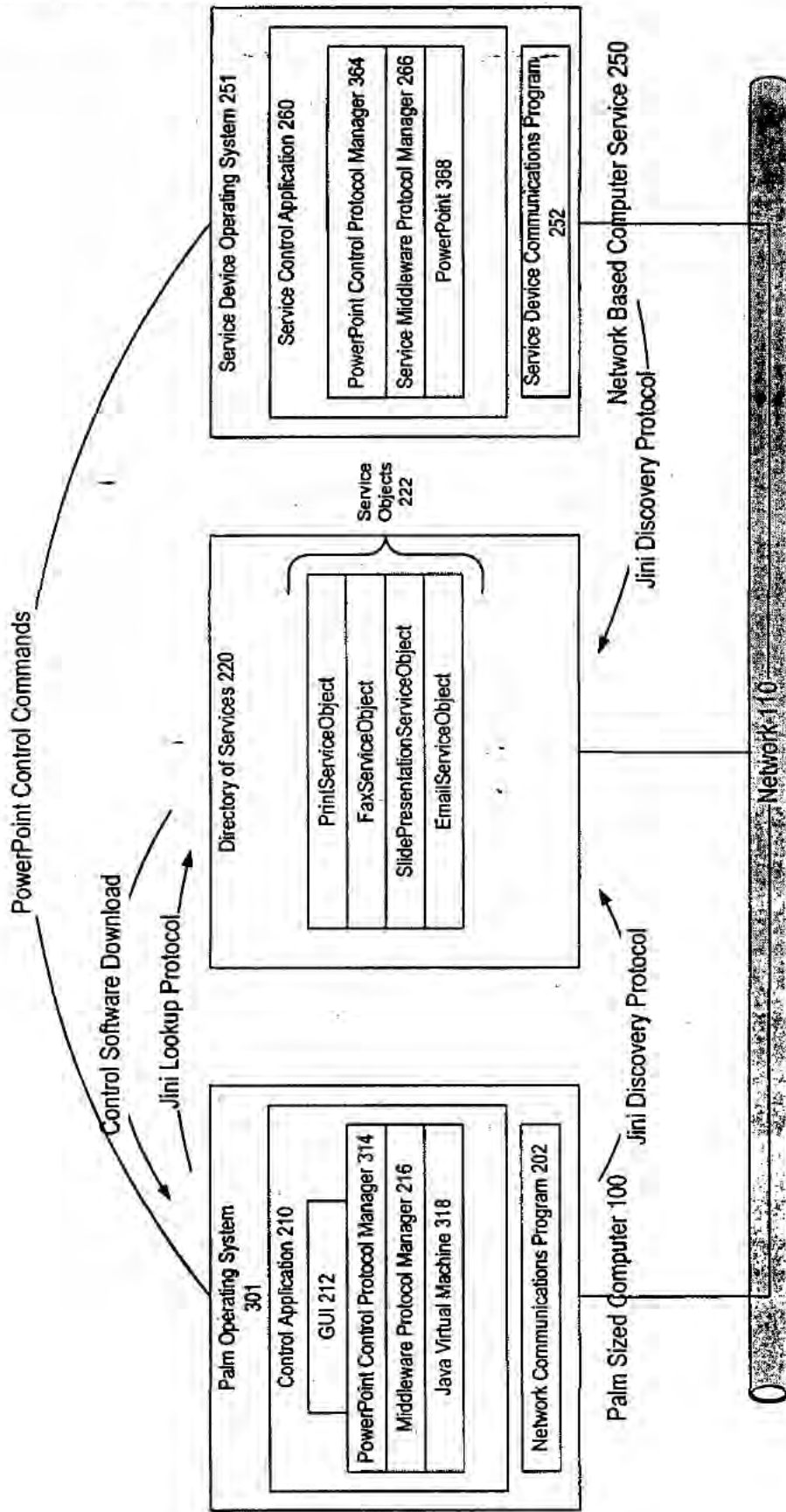
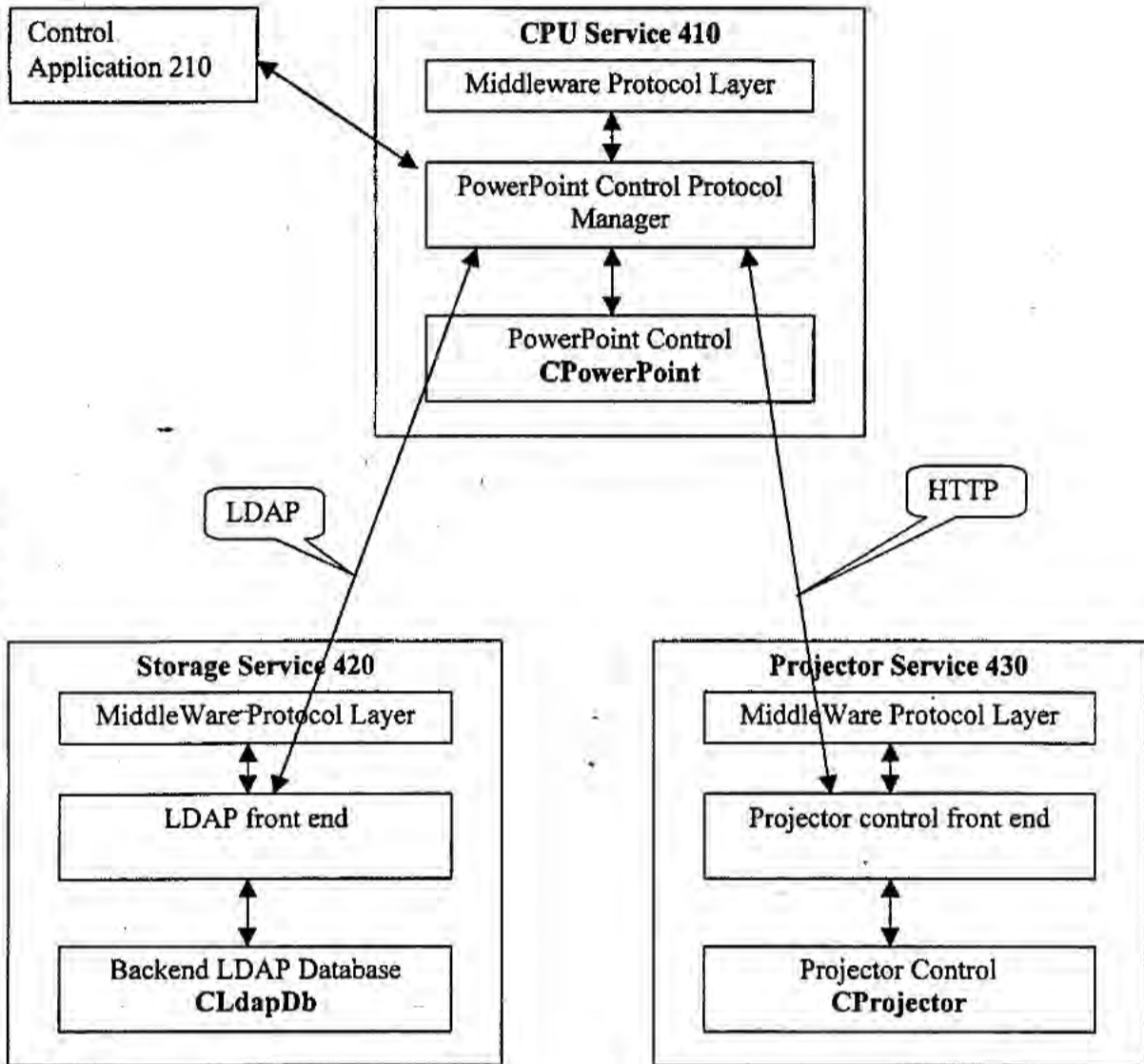


Figure 3

H:\PRIVATE\CLIENT\15686 3COM\318 Palm Sced Network Management Device and System\Fig 03 Example.vsd



09237609.012553

Figure 4

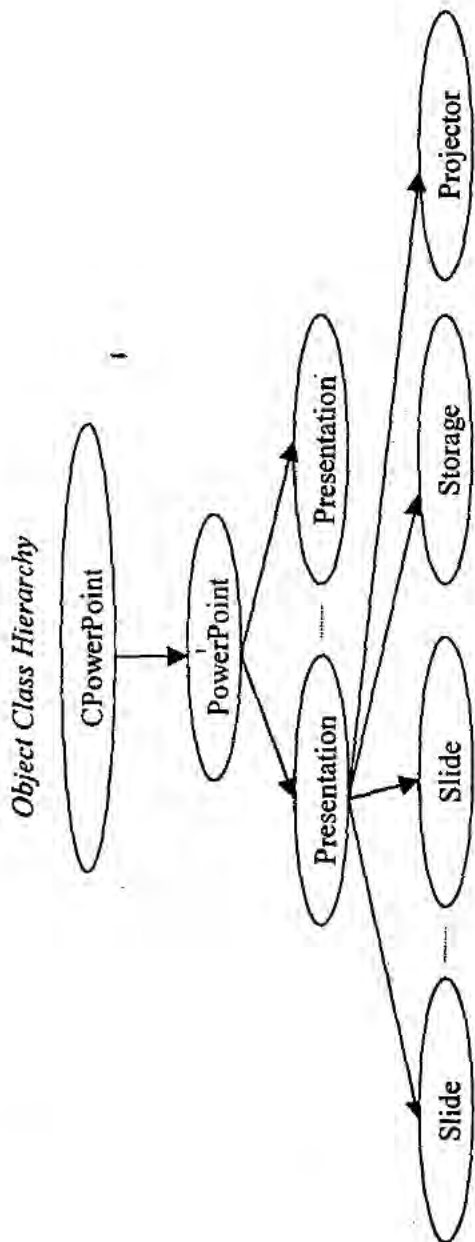


Figure 5

SECTION 8092250

Object Class Hierarchy for Network Services

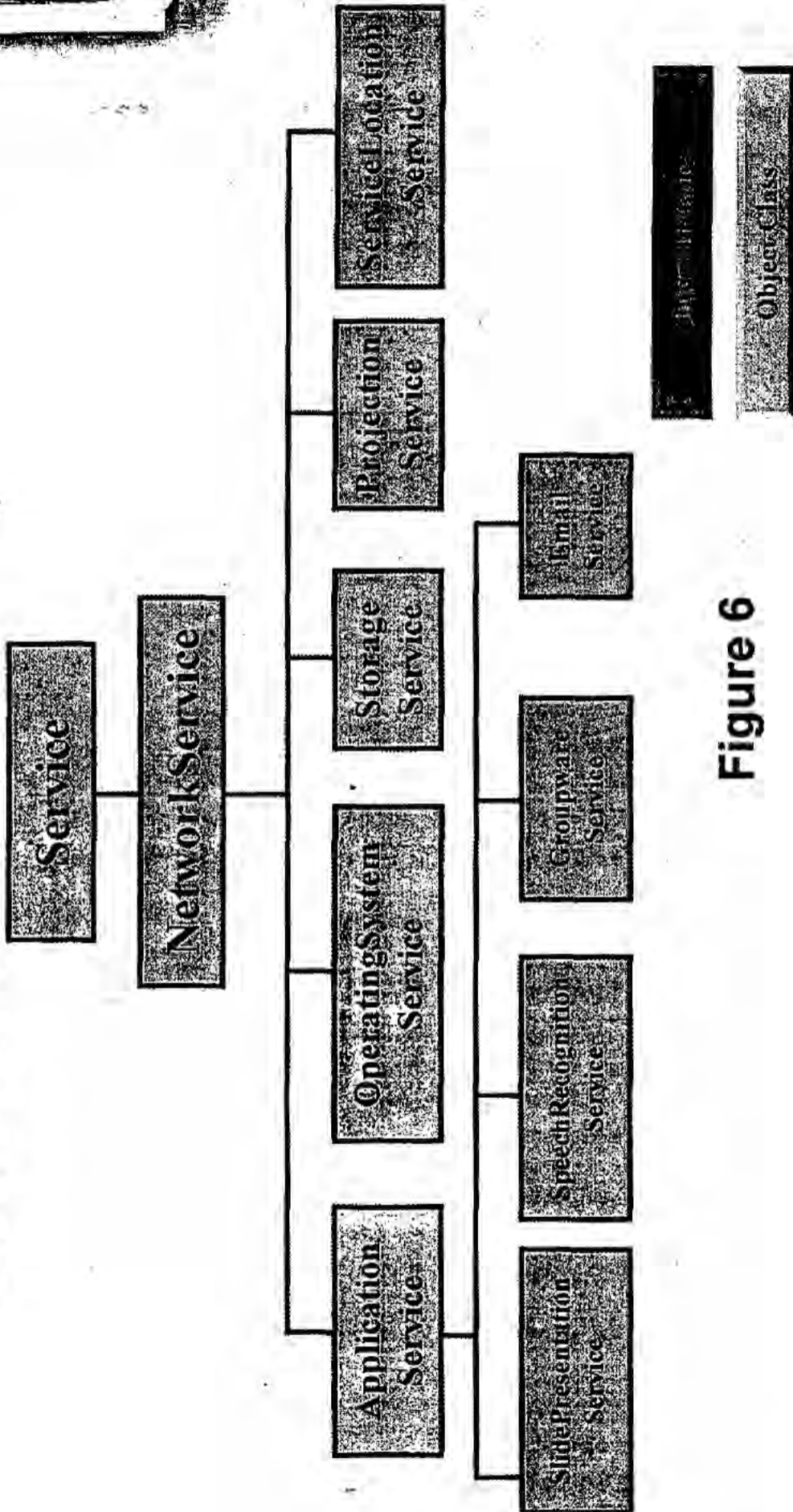


Figure 6

Object Class Hierarchy for Application Services

PRINT OF DRAWINGS AS ORIGINALLY FILED

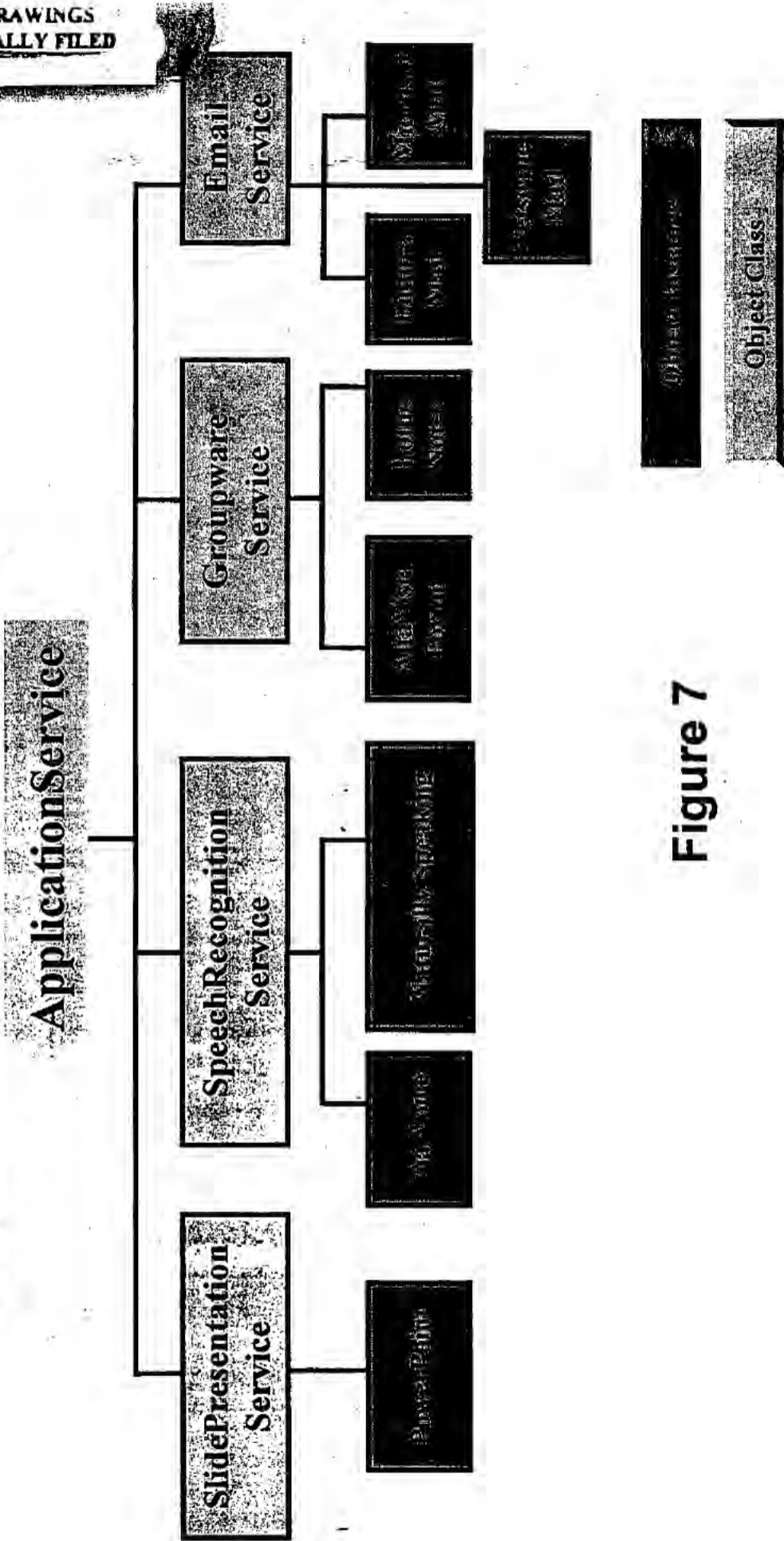


Figure 7

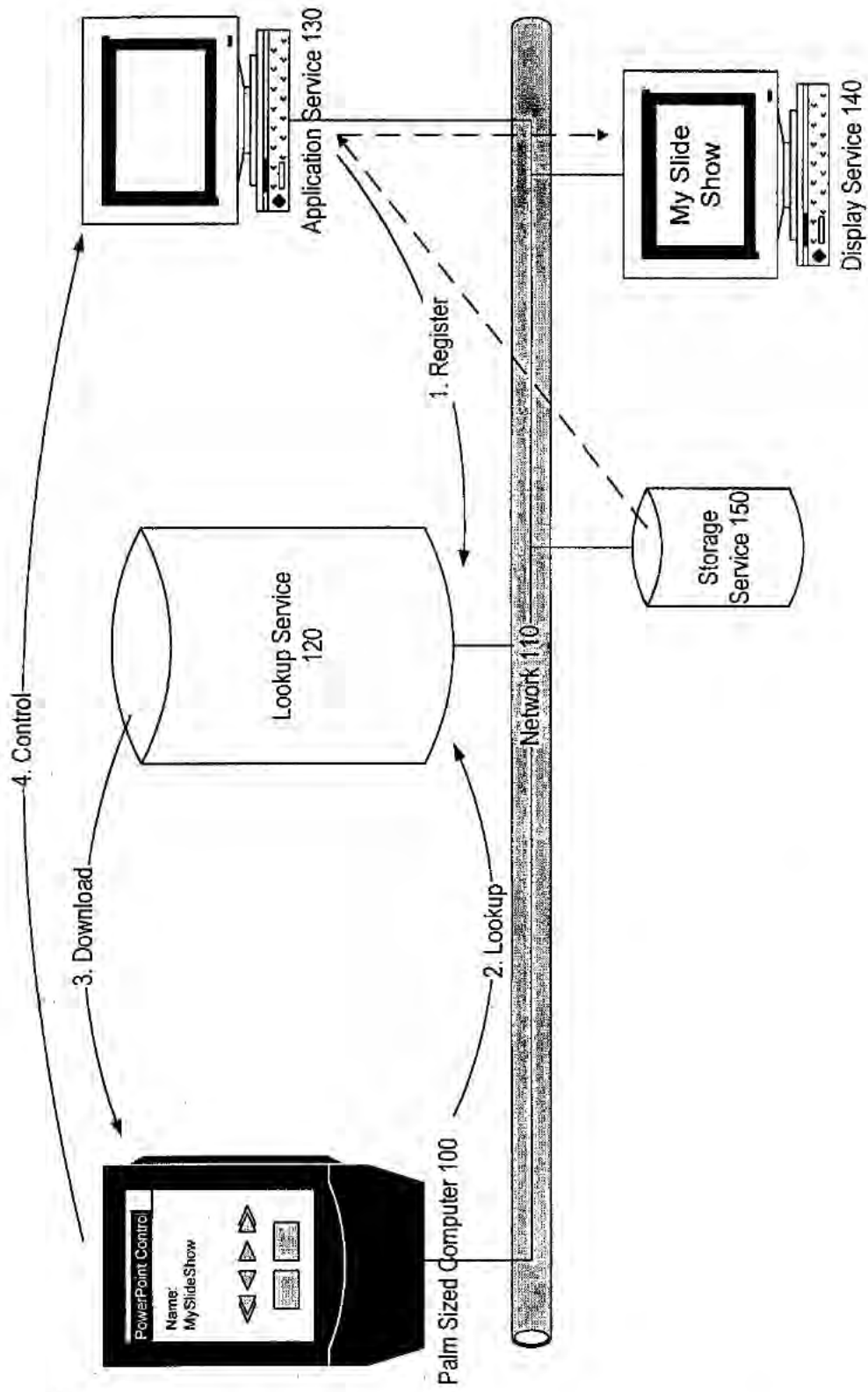


Figure 1

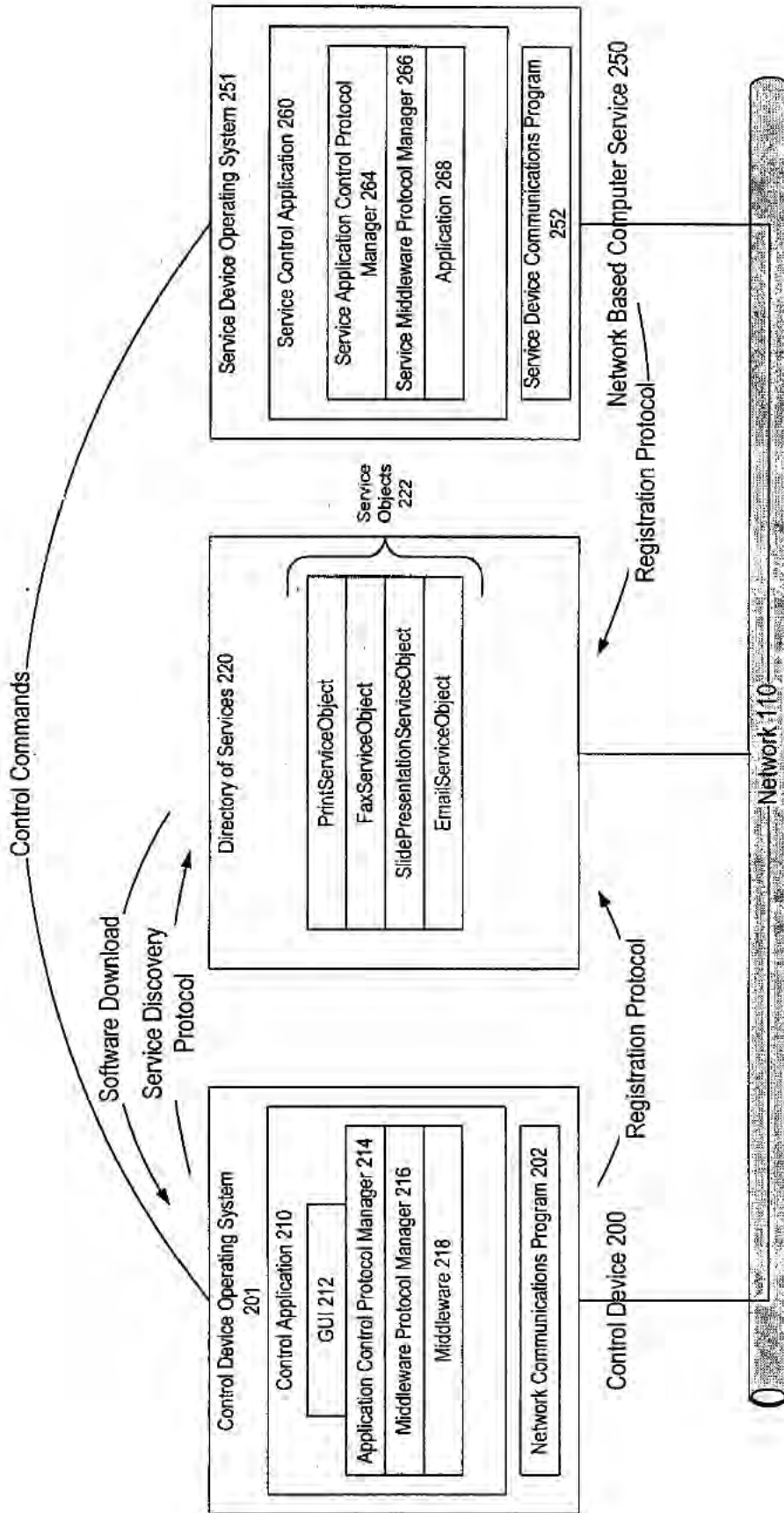


Figure 2

HYPERPRIVATECLIENT\158863COM\318 Palm Sized Network Management Device and System\Fig 03 Example.ved

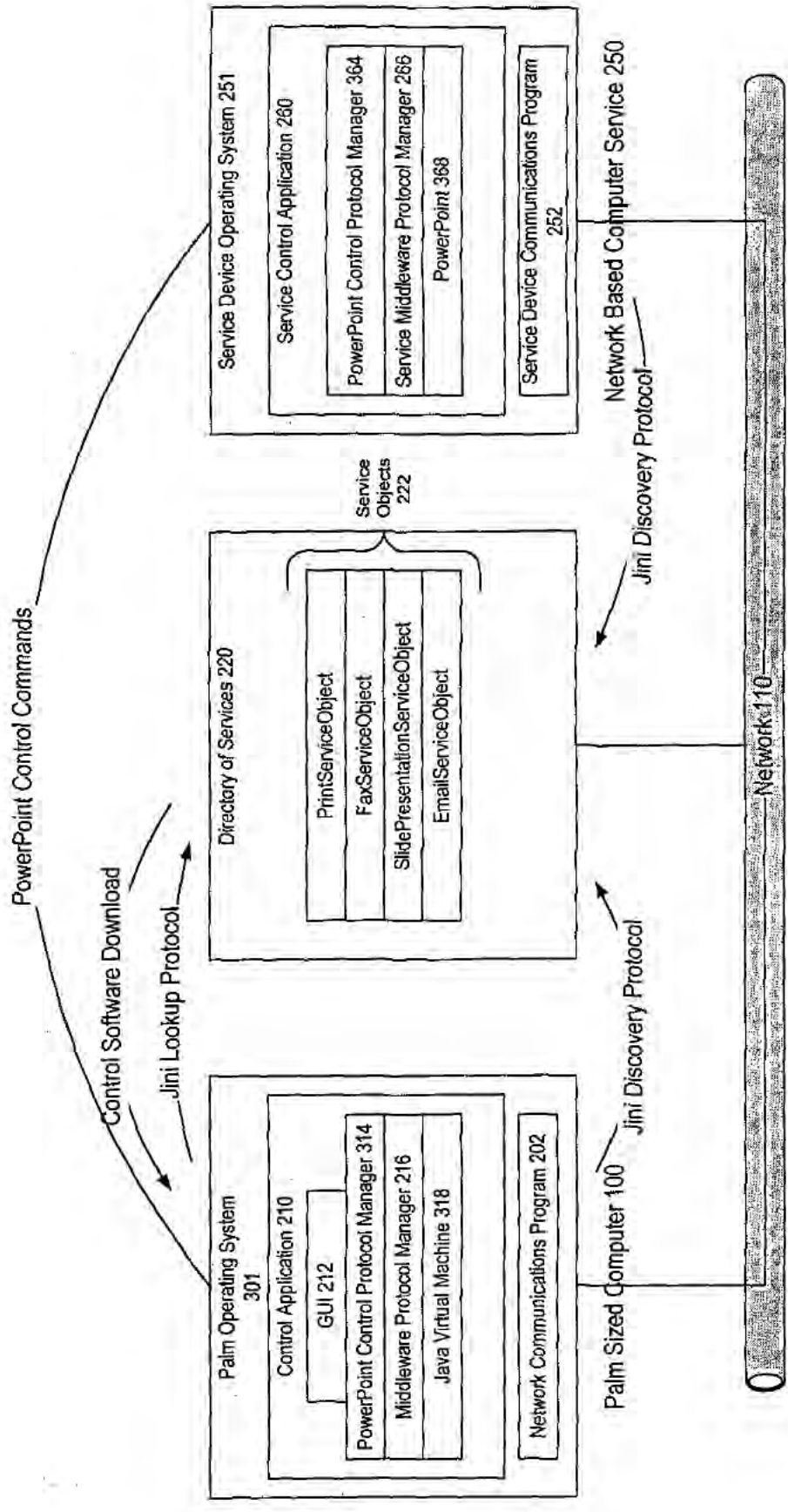


Figure 3

HYPERPRIVATECLIENT\158863COM\318 Palm Sized Network Management Device and System\Fig 03 Example.ved

66227009 710000

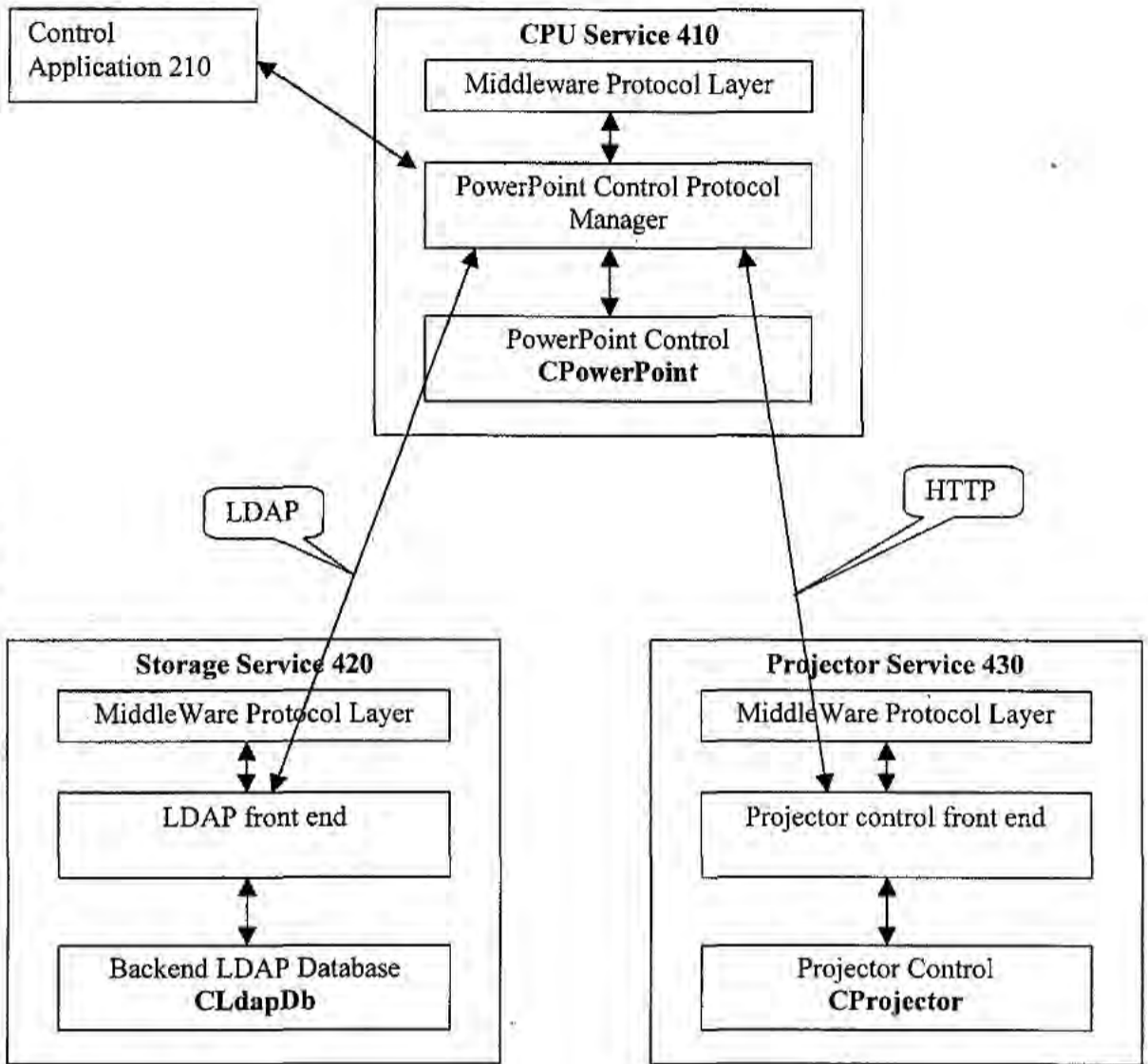


Figure 4

H:\PRIVATE\CLIENT\15886 3COM\318 Palm Sized Network Management Device and System\Fig 4 Example Detail.doc

SECRET 5026269

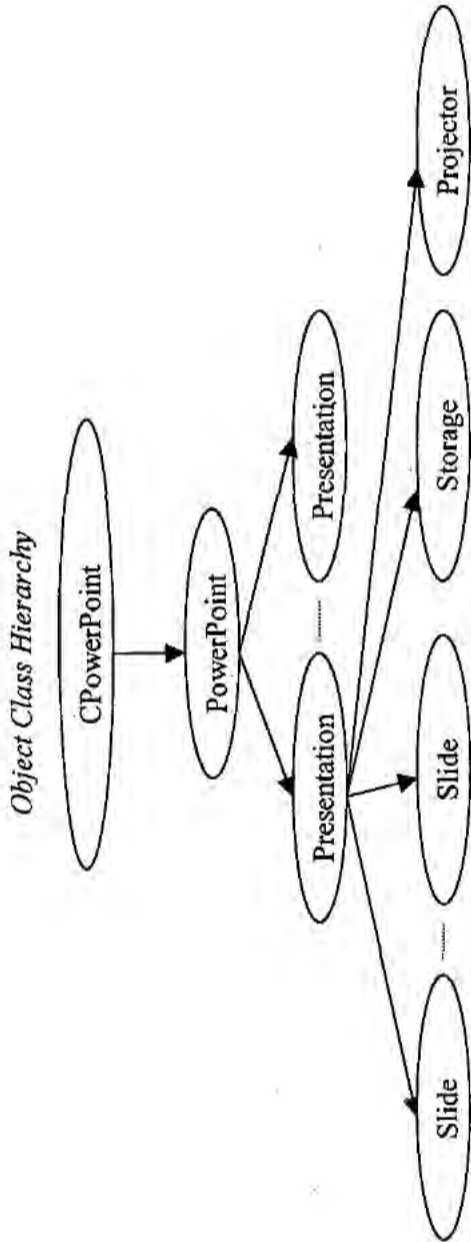


Figure 5

655210*609/0260

Object Class Hierarchy for Network Services

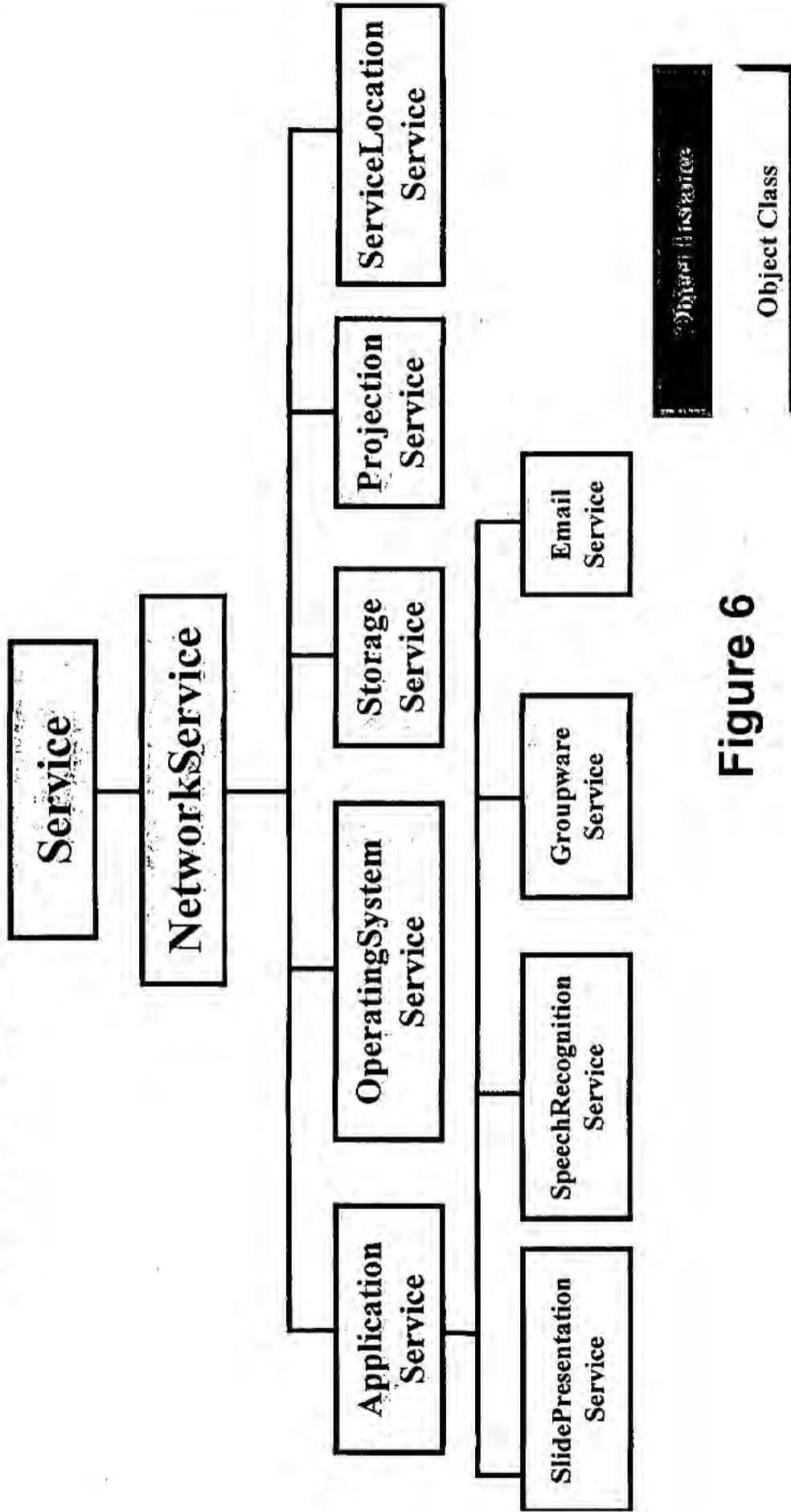


Figure 6

58210-6032250

Object Class Hierarchy for Application Services

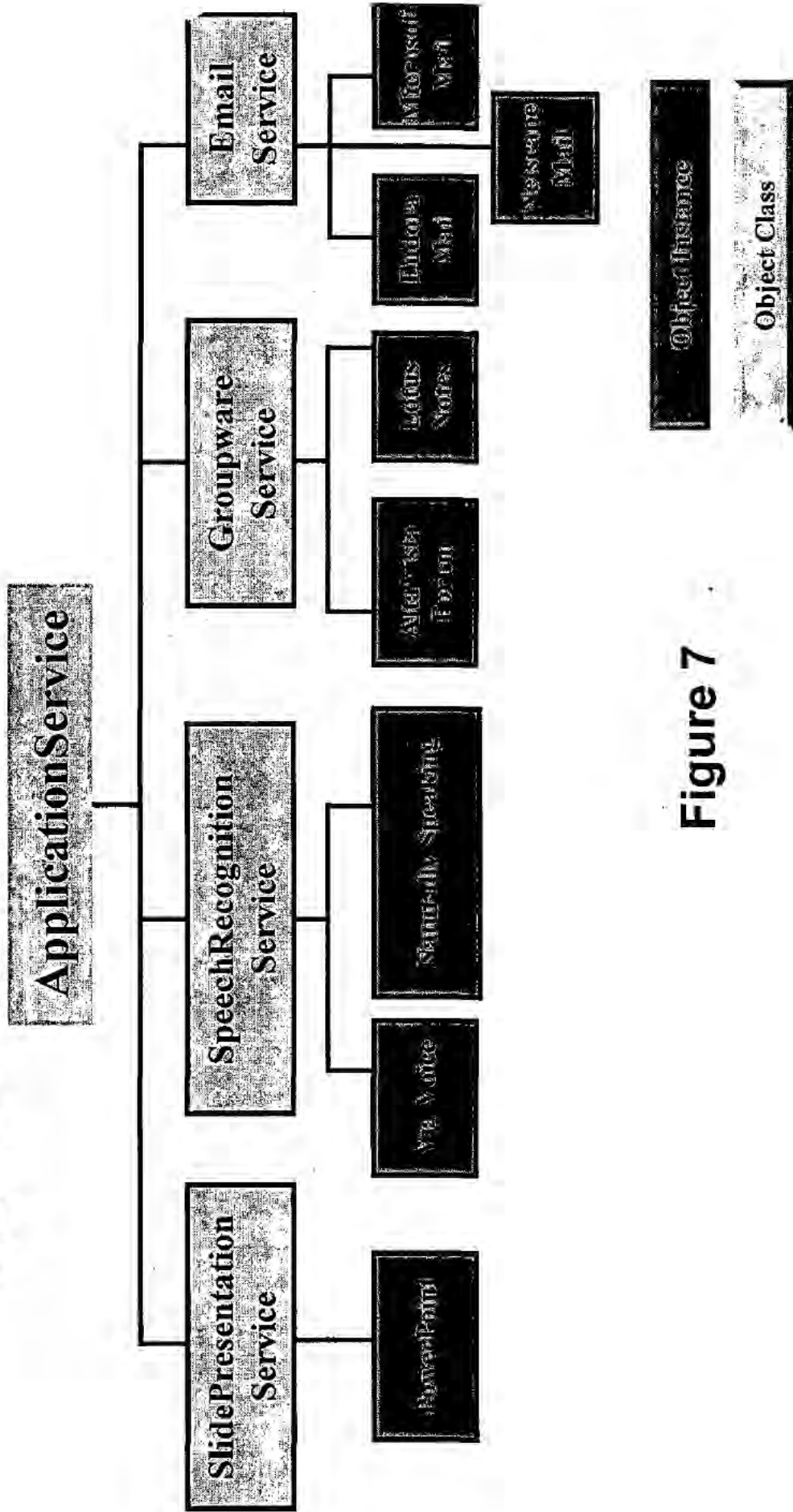


Figure 7

PATENT APPLICATION FEE DETERMINATION RECORD

Effective November 10, 1998

Application or Docket Number

09237609

CLAIMS AS FILED - PART I

(Column 1) (Column 2)

FOR	NUMBER FILED	NUMBER EXTRA
BASIC FEE		
TOTAL CLAIMS	21 minus 20 = *	1
INDEPENDENT CLAIMS	5 minus 3 = **	2
MULTIPLE DEPENDENT CLAIM PRESENT		

SMALL ENTITY TYPE OR OTHER THAN SMALL ENTITY

RATE	FEE	RATE	FEE
	380.00		760.00
X\$ 9=		X\$18=	18
X39=		X78=	156
+130=		+260=	
TOTAL		TOTAL	934

* 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)

1064

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	RATE	ADDITIONAL FEE
X\$ 9=		X\$18=	
X39=		X78=	
+130=		+260=	
TOTAL ADDIT. FEE		TOTAL ADDIT. FEE	

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

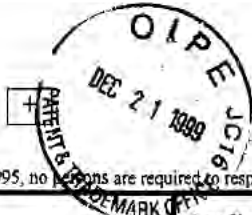
RATE	ADDITIONAL FEE	RATE	ADDITIONAL FEE
X\$ 9=		X\$18=	
X39=		X78=	
+130=		+260=	
TOTAL ADDIT. FEE		TOTAL ADDIT. FEE	

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	RATE	ADDITIONAL FEE
X\$ 9=		X\$18=	
X39=		X78=	
+130=		+260=	
TOTAL ADDIT. FEE		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.

Please type a plus sign (+) inside this box →



GAU 2756
2757

Approved for use through 09/30/2000. OMB 0651-0031
Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no response is required to a collection of information unless it displays a valid OMB control number.



TRANSMITTAL FORM

(To be used for all correspondence after initial filing)

Application Number	09/237,609
Filing Date	25 January 1999
First Named Inventor	Wenjun Luo
Group/Art Unit	2756
Examiner Name	Not Yet Assigned
Attorney Docket Number	15886-318
Total Number of Pages in This Submission	3

RECEIVED
DEC 22 1999
TECH CENTER 3700

ENCLOSURES (check all that apply)

<input type="checkbox"/> Fee Transmittal Form	<input type="checkbox"/> Assignment Papers (for an Application)	<input type="checkbox"/> After Allowance Communication to Group
<input type="checkbox"/> Fee Attached	<input type="checkbox"/> Drawing(s)	<input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences
<input type="checkbox"/> Amendment / Response	<input type="checkbox"/> Licensing-related Papers	<input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief)
<input type="checkbox"/> After Final	<input type="checkbox"/> Petition Routing Slip (PTO/SB/69) and Accompanying Petition	<input type="checkbox"/> Proprietary Information
<input type="checkbox"/> Affidavits/declaration(s)	<input type="checkbox"/> Petition to Convert to a Provisional Application	<input type="checkbox"/> Status Letter
<input type="checkbox"/> Extension of Time Request	<input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address	<input checked="" type="checkbox"/> Additional Enclosure(s) (please identify below)
<input type="checkbox"/> Express Abandonment Request	<input type="checkbox"/> Terminal Disclaimer	Preliminary Amendment: Return Postcard
<input type="checkbox"/> Information Disclosure Statement	<input type="checkbox"/> Small Entity Statement	
<input type="checkbox"/> Certified Copy of Priority Document(s)	<input type="checkbox"/> Request for Refund	
<input type="checkbox"/> Response to Missing Parts/ Incomplete Application	Remarks	
<input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53		

SIGNATURE OF APPLICANT, ATTORNEY OR AGENT

Firm or Individual name	Kent R. Richardson, Reg. No. 39,443, WILSON SONSINI GOODRICH & ROSATI		
Signature			
Date	12/12/99		

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on this date: 17 December 1999

Typed or printed name	Ann C. Williams		
Signature		Date	12/17/99

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

01/25/99
 135 U.S. PTO

Please type a plus sign (+) inside the box

Approved for through 09/30/00. OMB 0651-0032
 Patent and Trademark Office: DEPARTMENT OF COMMERCE

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UTILITY PATENT APPLICATION TRANSMITTAL <small>(Only for new nonprovisional applications under 37 CFR 1.53(b))</small>	Attorney Docket No.	15886-318	Total Pages	
	First Named Inventor or Application Identifier			
	Wenjun LUO et al., "System and Method Using a Palm Sized Computer to Control Network Devices"			
Express Mail Label No.		EM089310933 US		

<p style="text-align: center;">APPLICATION ELEMENTS</p> <p>See MPEP chapter 600 concerning utility patent application contents.</p> <p>1. <input type="checkbox"/> Fee Transmittal Form <i>(Submit an original, and a duplicate for fee processing)</i></p> <p>2. <input checked="" type="checkbox"/> Specification [Total Pages <u>28</u>] <i>(preferred arrangement set forth below)</i></p> <ul style="list-style-type: none"> - Descriptive title of the Invention - Cross References to Related Applications - Statement Regarding Fed sponsored R&D - Reference to Microfiche Appendix - Background of the Invention - Brief Summary of the Invention - Brief Description of the Drawings - Detailed Description - Claim(s) - Abstract of the Disclosure <p>3. <input checked="" type="checkbox"/> Drawing(s) (37 CFR 1.152) [Total Sheets <u>7</u>]</p> <p>4. <input type="checkbox"/> Oath or Declaration [Total Pages <u> </u>]</p> <ul style="list-style-type: none"> a. <input type="checkbox"/> Newly executed (original or copy) b. <input type="checkbox"/> Copy from a prior application (37 CFR 1.63(d)) <i>(for continuation/divisional with Box 17 completed)</i> [Note Box 5 below] i. <input type="checkbox"/> DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b). <p>5. <input type="checkbox"/> Incorporation By Reference (useable if Box 4b is checked) The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.</p>	<p style="text-align: center;">ADDRESS TO: Assistant Commissioner for Patents Box Patent Application Washington, DC 20231</p> <p>6. <input type="checkbox"/> Microfiche Computer Program (Appendix)</p> <p>7. Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary)</p> <ul style="list-style-type: none"> a. <input type="checkbox"/> Computer Readable Copy b. <input type="checkbox"/> Paper Copy (identical to computer copy) c. <input type="checkbox"/> Statement verifying identify of above copies <p>8. <input type="checkbox"/> Assignment Papers (cover sheet & documents(s))</p> <p>9. <input type="checkbox"/> 37 CFR 3.73(b) Statement [] Power of Attorney <i>(when there is an assignee)</i></p> <p>10. <input type="checkbox"/> English Translation Document (if applicable)</p> <p>11. <input type="checkbox"/> Information Disclosure Statement (IDS)PTO-1449 [] Copies of IDS Citations</p> <p>12. <input type="checkbox"/> Preliminary Amendment</p> <p>13. <input checked="" type="checkbox"/> Return Receipt Postcard (MPEP 503) <i>(Should be specifically itemized)</i></p> <p>14. <input type="checkbox"/> Small Entity Statement filed in prior application, Statement(s) [] Status still proper and desired</p> <p>15. <input type="checkbox"/> Certified Copy of Priority Document(s) <i>(if foreign priority is claimed)</i></p> <p>16. <input type="checkbox"/> Other:</p>
---	---

17. If a CONTINUING APPLICATION, check appropriate box and supply the requisite information:

Continuation Divisional Continuation-in-part (CIP) of prior application No. /

16. CORRESPONDING ADDRESS

Customer Number of Bar Code Label 021971 or Correspondence address below

Insert Customer No. or Attach bar code label here.

NAME			
ADDRESS			
CITY	STATE	ZIP CODE	
COUNTRY	TELEPHONE	FAX	

SUBMITTED BY
 Typed or Printed Name Kept R. Richardson Reg. Number 39,443
 Signature  Date January 25, 1999

DRHC\NR\PORTBL\PALIB\DRH\993330.1

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

FEE TRANSMITTAL Note: Effective December 8, 1999, Patent fees are subject to annual revision.		Complete if Known	
		Application Number	09/237,609
TOTAL AMOUNT OF PAYMENT (\$)		1,169.00	Filing Date 25 January 1999
		Inventor Named Inventor Wenjun Luo	Group Art Unit 2756
		Examiner Name Not Yet Assigned	Attorney Docket Number 15886-318

METHOD OF PAYMENT (check one)

1. The Commissioner is hereby authorized to charge indicated fees and credit any over payments to:

Deposit Account Number: 23-2415 (15886-318)
 Deposit Account Name: Wilson Sonsini Goodrich & Rosati

Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17
 Charge the Issue Fee Set in 37 CFR 1.18 at the Mailing of the Notice of Allowance

2. Payment Enclosed:
 Check Money Order Other

FEE CALCULATION

1. **FILING FEE**

Large Entity Code	Large Entity Fee (\$)	Small Entity Code	Small Entity Fee (\$)	Fee Description	Fee Paid
101	760	201	380	Utility filing fee	760.00
106	310	206	155	Design filing fee	
107	480	207	240	Plant filing fee	
108	760	208	380	Reissue filing fee	
114	150	214	75	Provisional filing fee	
SUBTOTAL (1) (\$)					760.00

2. **CLAIMS**

Total Claims	Independent Claims	Multiple Dependent Claims	Extra	Fee from below	Fee Paid
21	5		1	18	18.00
			2	78	156.00
			X	260	

Large Entity Code	Large Entity Fee (\$)	Small Entity Code	Small Entity Fee (\$)	Fee Description	Fee Paid
103	18	203	9	Claims in excess of 20	
102	78	202	39	Independent claims in excess of 3	
104	260	204	130	Multiple dependent claim	
109	78	209	39	Reissue independent claims over original patent	
110	18	210	9	Reissue claims in excess of 20 and over original patent	
SUBTOTAL (2) (\$)					174.00

FEE CALCULATION (continued)

3. **ADDITIONAL FEES**

Large Entity Code	Large Entity Fee (\$)	Small Entity Code	Small Entity Fee (\$)	Fee Description	Fee Paid
105	130	205	65	Surcharge - late filing fee or oath	130.00
127	50	227	25	Surcharge - late provisional filing fee or cover sheet	
139	130	139	130	Non-English specification	
147	2,520	147	2,520	For filing a request for reexamination	
112	920*	112	920*	Requesting publication of SIR prior to Examiner action	
113	1,840*	113	1,840*	Requesting publication of SIR after Examiner action	
115	110	215	55	Extension for reply within first month	
116	380	216	190	Extension for reply within second month	
117	870	217	435	Extension for reply within third month	
118	1,360	218	680	Extension for reply within fourth month	
128	1,850	228	925	Extension for reply within fifth month	
119	300	219	150	Notice of Appeal	
120	300	220	150	Filing a brief in support of an appeal	
121	260	221	130	Request for oral hearing	
138	1,510	138	1,510	Petition to institute a public use proceeding	
140	110	240	55	Petition to revive - unavoidable	
141	1,210	241	605	Petition to revive - unintentional	
142	1,210	242	605	Utility issue fee (or reissue)	
143	430	243	215	Design issue fee	
144	580	244	290	Plant issue fee	
122	130	122	130	Petitions to the Commissioner	
123	50	123	50	Petitions related to provisional applications	
126	240	126	240	Submission of Information Disclosure Stmt	
581	40	581	40	Recording each patent assignment per property (times number of properties)	80.00
146	790	246	395	Filing a submission after final rejection (37 CFR 1.129(a))	
149	760	249	380	For each additional invention to be examined (37 CFR 1.129(b))	
Other fee (specify) 25 Request for Corrected Filing Receipt					25.00
Other fee (specify)					
Reduced by Basic Filing Fee Paid					
SUBTOTAL (3) (\$)					235.00

SUBMITTED BY

Typed or Printed Name	Kent R. Richardson	Reg. Number	39,443
Signature		Deposit Account User ID	23-2415 (15886-318)
Date	4/9/99		

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

DRHC:INRPORTBLPALIB1ACW1019411.1

SERIAL NUMBER	FILING DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.	
09/237,609	01/25/99	709	2758 2154	15886-318	
APPLICANT	WENJUN LUO, FREMONT, CA; ELAINE P. LUSHER, PLEASANTON, CA.				
	CONTINUING DOMESTIC DATA*** VERIFIED <u>None, VV.</u>				
	371 (NAT'L STAGE) DATA*** VERIFIED <u>None, VV.</u>				
	FOREIGN APPLICATIONS*** VERIFIED <u>None, VV.</u>				
IF REQUIRED, FOREIGN FILING LICENSE GRANTED 02/10/99					
Foreign Priority claimed 35 USC 119 (e-d) conditions met	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no <input type="checkbox"/> yes <input checked="" type="checkbox"/> no <input type="checkbox"/> Met after Allowance	STATE OR COUNTRY	SHEETS DRAWING	TOTAL CLAIMS	INDEPENDENT CLAIMS
Verified and Acknowledged	<u>VV.</u> Examiner's Initials	CA	7	21	5
ADDRESS	SEE CUSTOMER NUMBER: 021971				
	SYSTEM AND METHOD USING A PALM SIZED COMPUTER TO CONTROL NETWORK DEVICES				
TITLE					
FILING FEE RECEIVED	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT NO. _____ for the following:		<input type="checkbox"/> All Fees <input type="checkbox"/> 1.16 Fees (Filing) <input type="checkbox"/> 1.17 Fees (Processing Ext. of time) <input type="checkbox"/> 1.18 Fees (Issue) <input type="checkbox"/> Other _____ <input type="checkbox"/> Credit _____		
\$1,064					

This Form is for INTERNAL P O USE ONLY
 it does NOT get mailed to the applicant.

**NOTICE OF FILING / CLAIM FEE(S) DUE
 (CALCULATION SHEET)**

APPLICATION NUMBER: _____

Total Fee Calculation

Fee Code	Sm./Lg.	Total # Claims	Number		Fee	Sm. Entity	Lg. Entity	=	Total
			Extra	X					
Basic Filing Fee	201/101						760	=	760
Total Claims >20	203/103	21	-20 =	1	X		18	=	18
Independent Claims >3	202/102	5	-3 =	2	X		78	=	156
Mult. Dep Claim Present	204/104							=	
Surcharge	205/105						130	=	130
English Translation	139							=	
TOTAL FEE CALCULATION									<u>1064</u>

Fees due upon filing the application:

Total Filing Fees Due = \$ 1064

Less Filing Fees Submitted - \$ _____

BALANCE DUE = \$ 1064


 Office of Initial Patent Examination



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
 Address: COMMISSIONER OF PATENTS AND TRADEMARKS
 Washington, D.C. 20231

APPLICATION NUMBER	FILING/RECEIPT DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO./TITLE
--------------------	---------------------	-----------------------	---------------------------

09/237,609 01/25/99 LIG 11 15886-315 **2**

021971 0212/0210
 WILSON SONSINI GOODRICH & ROSATI NOT ASSIGNED
 650 PAGE MILL ROAD
 PALO ALTO CA 94304-1050

2756
 DATE MAILED: 02/10/99

NOTICE TO FILE MISSING PARTS OF APPLICATION
Filing Date Granted

An Application Number and Filing Date have been assigned to this application. The items indicated below, however, are missing. Applicant is given **TWO MONTHS FROM THE DATE OF THIS NOTICE** within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a). If any of items 1 or 3 through 5 are indicated as missing, the **SURCHARGE** set forth in 37 CFR 1.16(e) of \$65.00 for a small entity in compliance with 37 CFR 1.27, or \$130.00 for a non-small entity, must also be timely submitted in reply to this NOTICE to avoid abandonment.

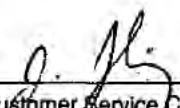
If all required items on this form are filed within the period set above, the total amount owed by applicant as a small entity (statement filed) non-small entity is \$ 1064.

- 1. The statutory basic filing fee is:
 - missing.
 - insufficient.
 Applicant must submit \$ 760 to complete the basic filing fee and/or file a small entity statement claiming such status (37 CFR 1.27).
- 2. The following additional claims fees are due:
 - \$ 18 for 1 total claims over 20.
 - \$ 156 for 2 independent claims over 3.
 - \$ _____ for multiple dependent claim surcharge.
 Applicant must either submit the additional claim fees or cancel additional claims for which fees are due.
- 3. The oath or declaration:
 - is missing or unsigned.
 - does not cover the newly submitted items.
 An oath or declaration in compliance with 37 CFR 1.63, including residence information and identifying the application by the above Application Number and Filing Date is required.
- 4. The signature(s) to the oath or declaration is/are by a person other than inventor or person qualified under 37 CFR 1.42, 1.43 or 1.47.
 A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.
- 5. The signature of the following joint inventor(s) is missing from the oath or declaration:

 An oath or declaration in compliance with 37 CFR 1.63 listing the names of all inventors and signed by the omitted inventor(s), identifying this application by the above Application Number and Filing Date, is required.
- 6. A \$50.00 processing fee is required since your check was returned without payment (37 CFR 1.21(m)).
- 7. Your filing receipt was mailed in error because your check was returned without payment.
- 8. The application was filed in a language other than English.
 Applicant must file a verified English translation of the application, the \$130.00 set forth in 37 CFR 1.17(k), unless previously submitted, and a statement that the translation is accurate (37 CFR 1.52(d)). FILE
- 9. OTHER: _____

Direct the reply and any questions about this notice to "Attention: Box Missing Parts."

A copy of this notice MUST be returned with the reply.


 Customer Service Center
 Initial Patent Examination Division (703) 308-1202



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
 Address: COMMISSIONER OF PATENTS AND TRADEMARKS
 Washington, D.C. 20231

*J.Dod
K.R.*

3

APPLICATION NUMBER	FILING/RECEIPT DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO./TITLE
09/237,609	01/25/99	LUO	W 15886-318

021971 0212/0210
 WILSON SONSINI GOODRICH & ROSATI
 650 PAGE MILL ROAD
 PALO ALTO CA 94304-1050

NOT ASSIGNED

2756

DATE MAILED:

02/10/99

NOTICE TO FILE MISSING PARTS OF APPLICATION
Filing Date Granted

An Application Number and Filing Date have been assigned to this application. The items indicated below, however, are missing. Applicant is given **TWO MONTHS FROM THE DATE OF THIS NOTICE** within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a). If any of items 1 or 3 through 5 are indicated as missing, the **SURCHARGE** set forth in 37 CFR 1.16(e) of \$65.00 for a small entity in compliance with 37 CFR 1.27, or \$130.00 for a non-small entity, must also be timely submitted in reply to this NOTICE to avoid abandonment.

If all required items on this form are filed within the period set above, the total amount owed by applicant as a

small entity (statement filed) non-small entity is \$ 1064

1. The statutory basic filing fee is:
 missing.
 insufficient.
 Applicant must submit \$ 760 to complete the basic filing fee and/or file a small entity statement claiming such status (37 CFR 1.27).

2. The following additional claims fees are due:
 \$ 18 for 1 total claims over 20.
 \$ 156 for 2 independent claims over 3.
 \$ _____ for multiple dependent claim surcharge.
 Applicant must either submit the additional claim fees or cancel additional claims for which fees are due.

*2/10/99 DJ
 US MISSING PARTS
 DUE - 4/10/99
 FINAL - 8/10/99
 K.R.
 15886-318*

3. The oath or declaration:
 is missing or unsigned.
 does not cover the newly submitted items.
 An oath or declaration in compliance with 37 CFR 1.63, including residence information and identifying the application by the above Application Number and Filing Date is required.

4. The signature(s) to the oath or declaration is/are by a person other than inventor or person qualified under 37 CFR 1.42, 1.43 or 1.47.
 A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.

5. The signature of the following joint inventor(s) is missing from the oath or declaration:

An oath or declaration in compliance with 37 CFR 1.63 listing the names of all inventors and signed by the omitted inventor(s), identifying this application by the above Application Number and Filing Date, is required.

6. A \$50.00 processing fee is required since your check was returned without payment (37 CFR 1.21(m)).

7. Your filing receipt was mailed in error because your check was returned without payment.

8. The application was filed in a language other than English.
 Applicant must file a verified English translation of the application, the \$130.00 set forth in 37 CFR 1.17(k), unless previously submitted, and a statement that the translation is accurate (37 CFR 1.52(d)).

9. OTHER:

Direct the reply and any questions about this notice to "Attention: Box Missing Parts."

A copy of this notice MUST be returned with the reply.

J. H.
 Customer Service Center
 Initial Patent Examination Division (703) 308-1202

04/14/1999	TLUU11	00000039	232415	09237609
01 FC:101				760.00 CH
02 FC:102				156.00 CH
03 FC:103				18.00 CH
04 FC:105				130.00 CH

Application No.: 09/237,609
Page 2

- two (2) Assignment documents, Form PTO-1595s, and the \$40.00 Assignment Recordation Fee for each;
- Revocation & New Power of Attorney by Assignee of Entire Interest;
- a verified English translation of the Application, and the \$130.00 fee as set forth in 37 CFR § 1.17(k);
- Other: Request for Corrected Filing Receipt and Redlined Filing Receipt (\$25.00);
- Other: Information Disclosure Statement: Information Disclosure Citation (Form PTO 1449) and One Cited Reference;
- A check in the amount of \$ _____.
- Charge \$1,169.00 to Deposit Account No. 23-2415 (Docket No. 15886-318).

The Commissioner is hereby authorized to charge any fees that may be required by this paper, and to credit any overpayment, to Deposit Account No. 23-2415 (Docket No. 15886-318). A duplicate of this paper is enclosed.

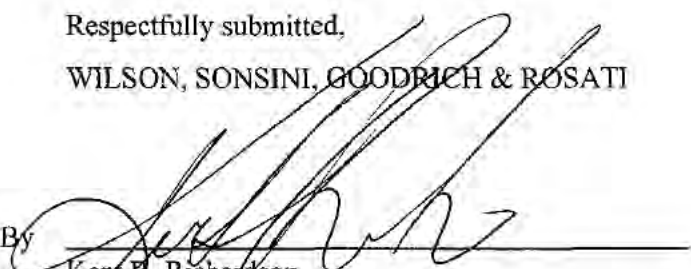
Respectfully submitted,

WILSON, SONSINI, GOODRICH & ROSATI

Date: _____

4/9/09

By _____


Kent R. Richardson
Registration No. 39,443

WILSON SONSINI GOODRICH & ROSATI
650 Page Mill Road
Palo Alto, CA 94304-1050
(650) 493-9300

C:\NRPORTBL\PALIB\ACW\1019424.1



**COMBINED DECLARATION AND POWER OF ATTORNEY
FOR UTILITY PATENT APPLICATION**

As a below-named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**SYSTEM AND METHOD USING A PALM SIZED COMPUTER
TO CONTROL NETWORK DEVICES**

the specification of which

_____ is attached hereto.

X was filed on 25 January 1999 as Application No. 09/237,609
and was amended on * _____
(If Applicable)

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 acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a) which states in relevant part: "Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section....The duty to disclose all information known to be material to patentability is deemed to be satisfied if all information known to be material to patentability of any claim issued in a patent was cited by the Office or submitted to the Office in the manner prescribed by §§ 1.97(b)-(d) and 1.98."

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate as indicated below and have also identified below any foreign application for patent or inventor's certificate on this invention having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)			Priority Claimed	
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	_____ Yes	_____ No
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	_____ Yes	_____ No

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s), and under §119(e) of any United States provisional application(s), listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulation, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

_____ (Application Serial No.)	_____ (Filing Date)	_____ (Patented, Pending, Abandoned)
_____ (Application Serial No.)	_____ (Filing Date)	_____ (Patented, Pending, Abandoned)

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith, and to file, prosecute and to transact all business in connection with international applications directed to said invention:

Paul Davis	29,294
John J. Bruckner	35,816
Charles C. Cary	36,764
Michael J. Murphy	37,404
David J. Weitz	38,362
Kent R. Richardson	39,443
David J. Abraham	39,554
U.P. Peter Eng	39,666
George A. Willman	41,378
Henry J. Groth	39,696
Steven J. Benerofe	41,613
Travis L. Dodd	42,491
Jinntung Su	42,174
Hayward A. Verdun	43,223
Van Mahamedi	42,828
Shantanu Basu	43,318
Jeffrey Wheeler	39,066

Address all correspondence to:

Kent R. Richardson
Wilson Sonsini Goodrich & Rosati
650 Page Mill Road
Palo Alto, CA 94304

Direct all telephone calls to Kent R. Richardson at (650) 493-9300.

I hereby 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 Title 18, United States Code, §1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor: Wenjun Luo
Inventor's signature: _____
Date: _____
Citizenship: China
Residence: 40664 Witherspoon Terrace, Fremont, CA 94538
Post Office Address: Same as above.

Full name of second joint inventor, if any: Elaine P. Lusher
Inventor's signature: Elaine P. Lusher
Date: April 7, 1999
Citizenship: United States
Residence: 456 Montori Court, Pleasanton, CA 94566
Post Office Address: Same as above.

COPY

Attorney Docket No. 15886-318



**JOINT TO CORPORATE
ASSIGNMENT**

WHEREAS, the undersigned,

LUO, Wenjun
40664 Witherspoon Terrace
Fremont, CA 94538

LUSHER, Elaine
456 Montori Court
Pleasanton, CA 94566

hereinafter termed "Inventors", have invented certain new and useful improvements in

**SYSTEM AND METHOD USING A PALM SIZED COMPUTER
TO CONTROL NETWORK DEVICES**

and have filed an application for a United States patent disclosing and identifying the above invention 25 January 1999 as Application No. 09/237,609 (hereinafter termed "application"); and

WHEREAS, 3Com Corporation, a corporation of the State of Delaware, having a place of business at 5400 Bayfront Plaza, Santa Clara, California 95052-8145, (hereinafter termed "Assignee"), is desirous of acquiring the entire right, title and interest in and to said application and the invention disclosed therein, and in and to all embodiments of the invention, heretofore conceived, made or discovered jointly or severally by said Inventors (all collectively hereinafter termed "said invention"), and in and to any and all patents, inventor's certificates and other forms of protection (hereinafter termed "patents") thereon granted in the United States and foreign countries.

NOW, THEREFORE, in consideration of good and valuable consideration acknowledged by said Inventors to have been received in full from said Assignee:

1. Said Inventors do hereby sell, assign, transfer and convey unto said Assignee the entire right, title and interest (a) in and to said application and said invention; (b) in and to all rights to apply for foreign patents on said invention pursuant to the International Convention for the Protection of Industrial Property or otherwise; (c) in and to any and all applications filed and any and all patents granted on said invention in the United States or any foreign country, including each and every application filed and each and every patent granted on any application which is a divisional, substitution, continuation, or continuation-in-part of any of said applications; and (d) in and to each and every reissue or extensions of any of said patents.

2. Said Inventors hereby jointly and severally covenant and agree to cooperate with said Assignee to enable said Assignee to enjoy to the fullest extent the right, title and interest herein conveyed in the United States and foreign countries. Such cooperation by said Inventors shall include prompt production of pertinent facts and documents, giving of testimony, execution of petitions, oaths, specifications, declarations or other papers, and other assistance all to the extent deemed necessary or desirable by said Assignee (a) for perfecting in said Assignee the right, title and interest herein conveyed; (b) for prosecuting any of said applications; (c) for filing and prosecuting substitute, divisional, continuing or additional applications covering said invention; (d) for filing and prosecuting applications for reissuance of any said patents; (e) for interference or other priority proceedings involving said invention; and (f) for legal proceedings involving said invention and any applications therefor and any patents granted thereon, including without limitation reissues and reexaminations, opposition proceedings, cancellation proceedings, priority contests, public use proceedings, infringement actions and court actions; provided, however, that the expense incurred by said Inventors in providing such cooperation shall be paid for by said Assignee.

COPY

Attorney Docket No. 15886-318

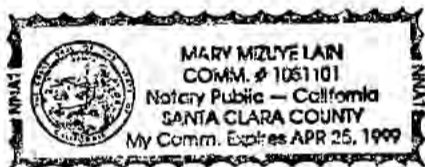
3. The terms and covenants of this assignment shall inure to the benefit of said Assignee, its successors, assigns and other legal representatives, and shall be binding upon said Inventors, their respective heirs, legal representatives and assigns.

4. Said Inventors hereby jointly and severally warrant and represent that they have not entered and will not enter into any assignment, contract, or understanding in conflict herewith.

IN WITNESS WHEREOF, said Inventors have executed and delivered this instrument to said Assignee as of the dates written below.

Wenjun Luo
Wenjun Luo

3/16/99
Date



State of CALIFORNIA)
County of SANTA CLARA)

On MARCH 16, 1999, before me, MARY MIZUYE LAIN, personally appeared WENJUN LUO

personally known to me or proved to me on the basis of satisfactory evidence, to be the person whose name is subscribed to the within instrument and acknowledged to me that he/she executed the same in his/her authorized capacity, and that by his/her signature on the instrument the person or the entity upon behalf of which the person acted, executed the instrument.

WITNESS my hand and official seal.

Mary Mizuye Lain
(Notary Public)

State of)
County of)

Elaine P. Lusher

Date

On _____, 199__, before me, _____, personally appeared _____

personally known to me or proved to me on the basis of satisfactory evidence, to be the person whose name is subscribed to the within instrument and acknowledged to me that he/she executed the same in his/her authorized capacity, and that by his/her signature on the instrument the person or the entity upon behalf of which the person acted, executed the instrument.

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(Notary Public)

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Attorney Docket No. 15886-318

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Attorney docket No. 15886-318

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IN WITNESS WHEREOF, said Inventors have executed and delivered this instrument to said Assignee as of the dates written below.

State of _____)
 County of _____)

On _____, 199____, before me, _____,
 personally appeared _____,
 personally known to me or proved to me on the basis of
 satisfactory evidence, to be the person whose name is subscribed to
 the within instrument and acknowledged to me that he/she executed
 the same in his/her authorized capacity, and that by his/her signature
 on the instrument the person or the entity upon behalf of which the
 person acted, executed the instrument.

WITNESS my hand and official seal.

Wenjun Luo

Date

(Notary Public)

State of Florida)
 County of Collier)

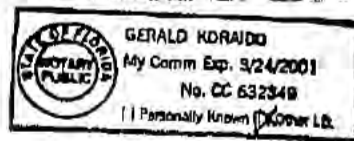
On April 17, 1999, before me, Gerald Koraidd,
 personally appeared Elaine P. Lusher,
 personally known to me or proved to me on the basis of
 satisfactory evidence, to be the person whose name is subscribed to
 the within instrument and acknowledged to me that he/she executed
 the same in his/her authorized capacity, and that by his/her signature
 on the instrument the person or the entity upon behalf of which the
 person acted, executed the instrument.

WITNESS my hand and official seal.

Elaine P. Lusher
Elaine P. Lusher

April 7, 1999
Date

(Notary Public)





#4

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the U.S. Postal Service with sufficient postage as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on 9 April 1999

Ann C. Williams

(Typed or Printed Name of Person Mailing Paper or Fee)

(Signature of Person Mailing Paper or Fee)

PATENT
Attorney Docket No.: 15886-318

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application	) <u>PATENT APPLICATION</u>
Wenjun Luo, Elaine P. Lusher)
Application No.: 09/237,609	) Art Unit: 2756
Filed: 25 January 1999	) Examiner: Not Yet Assigned
Title: <i>System And Method Using A Palm Sized Computer To Control Network Devices</i>)

INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. §1.97

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Listed below or on an attached Form PTO-1449 is information known to applicant(s). A copy of each listed publication and U.S. and foreign patent, except for pending U.S. applications, is being submitted herewith, along with a concise explanation of information in a foreign language, if any, pursuant to 37 C.F.R. §1.97-1.98.

Applicants respectfully request that the listed information be considered by the Examiner and be made of record in the above-identified application. If form PTO-1449 is enclosed, the Examiner is requested to initial and return it in accordance with MPEP §609.

This statement is not intended to represent that a search has been made or that the information cited in the statement is, or is considered to be, material to patentability as defined in §1.56.

X This statement qualifies under 37 C.F.R. §1.97, subsection (b) because (check all that apply):

- X (1) It is being filed within 3 months of the application filing date
-- OR --
___ (2) It is being filed within 3 months of entry of a national stage
-- OR --
X (3) It is being filed before the mail date of the first Office Action on the merits.

___ 37 C.F.R. §1.97(c). If this statement is being filed after the latest of: (1) three months beyond the filing date of a national application; (2) three months beyond the date of entry of the national stage as set forth in §1.491 in an international application; or (3) the mailing date of a first Office action on the merits, but before the mailing date of the earlier of a final office action under §1.113 or a notice of allowance under §1.311, then:

- ___ a certification as specified in §1.97(e) is provided below; or
___ a fee of \$240.00 as set forth in §1.17(p) is authorized below, enclosed, or included with the payment of other papers filed together with this statement.

___ 37 C.F.R. §1.97(d). If this statement is being filed after the mailing date of the earlier of a final office action under §1.113 or a notice of allowance under §1.311, but before payment of the issue fee, then:

- A. a certification as specified in §1.97(e) is completed below; and
B. a petition under 37 C.F.R. §1.97(d) requesting consideration of this statement is submitted herewith; and
C. a fee of \$130.00 as set forth in §1.17(i)(1) is authorized below, enclosed, or included with the payment of other papers filed together with this statement.

X *Fee Authorization.* The Commissioner is hereby authorized to charge underpayment of any additional fees or credit any overpayment associated with this communication to Deposit Account No. 23-2415 (Docket No.: 15886-318). A duplicate copy of this authorization is enclosed.

Respectfully submitted,
WILSON SONSINI GOODRICH & BOSATI

Date: 4/9/99

By: 

Kent R. Richardson
Reg. No. 39,443

650 Page Mill Road
Palo Alto, CA 94304-1050
(650) 493-9300

- 2 -

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Attorney Docket No.: 15886-318



CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the U.S. Postal Service with sufficient postage as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on 9 April 1999

Ann C. Williams

(Typed or Printed Name of Person Mailing Paper or Fee)

Ann C. Williams

(Signature of Person Mailing Paper or Fee)

PATENT
Attorney Docket No.: 15886-318

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application	)	<u>PATENT APPLICATION</u>
)	
Wenjun Luo, Elaine P. Lusher)	
	)	Art Unit: 2756
Application No.: 09/237,609)	
	)	Examiner: Not Yet Assigned
Filed: 25 January 1999)	
)	
Title: <i>System And Method Using A Palm Sized Computer</i>)	
<i>To Control Network Devices</i>)	
)	

INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. §1.97

Assistant Commissioner for Patents
Washington, D.C. 20231

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Respectfully submitted,
WILSON SONSINI GOODRICH & ROSATI

Date: 4/19/99

By: 
Kent R. Richardson
Reg. No. 39,443

650 Page Mill Road
Palo Alto, CA 94304-1050
(650) 493-9300



By Michael McCandless
MIT Laboratory for Computer Science
mikemc@cs.mit.edu

The PalmPilot and the handheld revolution

Have you thought that perhaps the computer belongs in your hand rather than on your desk? With many failed and still-failing efforts, handheld computation has been taking a long time to arrive. However, the unquestionable success of 3Com's PalmPilot heralds the start of a revolution in computation.

Contrary to many past and present devices, the Pilot proves that portable computers don't have to mimic desktops to be useful and successful. As a result, handheld computers are incorporating new technologies, and the market is rapidly changing. Soon, many of us will spend more time interacting with our handheld devices than with our desktop computers.

The many guises of portable computers

Portable computers come in many forms and under many names. At one extreme are laptops, which are basically desktop PCs that have been reduced enough to be lugged around. At the other extreme are Personal Digital Assistants (PDAs), which use a stylus or a few buttons, rather than a keyboard, for navigation and input. In between, suffering something of an identity crisis, are the handheld PCs (HPCs) and palmtop devices, sporting tiny fold-up keyboards and running a pared-down version of Windows 95 called Windows CE.

So far, the PC has been the most successful form of computation. As a result, when branching out to produce portable computing devices, most companies simply aim to mimic the PC. However, such a

model is inappropriate for space-starved portable devices. The now-failed Go Corporation was the first company to break tradition and introduce interaction using only a stylus. Apple continued the endeavor, leading to the present MessagePad 2100, but stylus-based PDA's have caught on only gradually. Now, the Pilot has taken the lead at an exceptional pace. According to PC Data, the Pilot accounts for 70% of US retail PDA sales. According to DataQuest, in 1996, the Pilot accounted for 51% of the 1.6 million handheld devices sold worldwide. These figures are amazing, given that

the Pilot first appeared on the market in early 1996. In retrospect, the Pilot will be seen as a turning point in the migration of computation from desktop machines to handheld devices.

Behind Pilot's success

The Pilot comes with numerous built-in applications to manage personal information—for example, calendar, to-do lists, memo pad, and address book. The touch-sensitive monochrome LCD display is used for navigation, and a simplified and easy-to-learn alphabet called Graffiti is used for input. The touch of a button synchronizes the Pilot with a desktop PC, using 3Com's HotSync technology, which also backs up data and installs new applications.

The key to the Pilot's success is its simplicity. The design is achievable rather than overly ambitious. For example, requiring the user to learn a simplified alphabet allows for accurate and predictable letter recognition. The simple design translates into affordability: the PalmPilot Personal costs \$249, compared to \$1,000 for Apple's MessagePad 2100. It also leads to wonderful portability. The Pilot weighs under six ounces, including batteries, and is a little larger than a wallet. Finally, its open architecture and available software-development systems—for example, CodeWarrior, by Metrowerks—have allowed developers and companies to offer many useful third-party applications. By simplifying the design, 3Com achieved a realistic, inexpensive, and practical device.

The Pilot clearly shows that a handheld device driven only with a stylus can be successful. Naturally, other companies are



eager to get in the market. Sharp just released the SE-500 Mobile Organizer, which looks like the Pilot but lacks handwriting recognition and runs with a proprietary OS. Franklin Electronic Publishers created the Rex PC Companion, a stripped-down device with no input, which lets you browse information downloaded from a PC.

It's all about information

Why are these devices so successful in the first place?

The answer is clear: people need to keep track of all sorts of personal information. We have always had this need, and our lives are becoming even busier and more connected. We need to schedule our day, look up phone numbers, remember the names of people to whom we were introduced, keep track of birthdays, read the latest news, trade our favorite stocks, and remember what to do, including when and where. There's a name for all these things: *Personal Information Management*.

The PIM market for desktop PCs is already well-established, including products such as Microsoft Outlook, Lotus Organizer, and Now Up-To-Date. A strong market also exists for paper-based organizers. The Pilot makes carrying all this information with us practical, so that we can access it anywhere and anytime. It's the same crucial information with which we've always been working; the Pilot is just a better means of getting to it and maintaining it.

In the pipeline

We're at the beginning of a long race in which many will eagerly contend. Although the Pilot might or might not retain its lead, we consumers will continue to win. Competition will bring prices down while improving functionality. Most important, three enabling technologies loom on the horizon: wireless networking, the Global Positioning System, and cryptography.

Wireless networking. PDAs will soon come with built-in access to a ubiquitous wireless network. This will render HotSync a thing of the past; your PDA will transpar-



ently back up your data, at all times. In fact, you will no longer worry about where your data actually is, because that will not matter. People will share access to the same underlying data, stored on a central server, despite being separated in space or time. An executive, while traveling, will see changes to his or her calendar as they are made in real time back in the office. All family members will be able to update the grocery list, anywhere and anytime, and whoever does the shopping will see these changes.

Using this network, your PDA will eventually subsume the functionality of the remote controls in your home. You will control and configure your home appliances through your PDA. You will set your alarm clock; read your personalized TV guide and program your VCR; turn down the stereo or select a different song or radio station; and program, from your car or the subway, your home's heater to turn on shortly before you arrive there. This network won't need to be, and probably will not be, very high performance to provide most of these new services. Rather, it will serve as a stepping stone, motivating and then financing better infrastructure.

The network relaxes where and how computation occurs. For example, applications that are too compute- or space-intensive to run directly on your PDA will run, instead, on a remote high-performance computer, but then return the output of the computation. When new versions of applications are released, your PDA will automatically update. The boundary between your PDA and the rest of the world will become blurred.

In due time, your PDA will absorb the other things you now feel compelled to carry in your pockets. Keys, now rendered as metal, plastic, or a magnetic strip, will instead be stored as bits in your PDA. All forms of currency will have digital correlates, letting you buy groceries without worrying about visiting the ATM first. Likewise, forms of identification—for example, your driver's license and Social Security card—will be digital. People will no longer be able to lie about their age and identity.

Global Positioning System.

Using satellites and land towers, a GPS device, soon to be one chip plus an antenna, can locate its position on the Earth's surface within three meters. PDAs will incorporate GPS. You will consult your PDA to navigate in a foreign city or to find the nearest ATM or gas station, or a good place to eat. Over the network, your PDA will monitor traffic congestion, the weather, and construction conditions, altering its recommended route as needed. You will be able to locate your children or track the entire family in the mall or on the ski slope.

Cryptography. Security is a big concern with present and future PDAs. I store all sorts of very private information on my Pilot—account numbers and passwords, PINs for my credit cards, telephone numbers—all of which I do not want to fall into the wrong hands. And as PDAs come to absorb everything on our key chains and in our wallets, it would seem that if you lose your PDA, you lose yourself.

In the short term, however, there are excellent tools that use strong cryptography to protect your information—for example, Andreas Linke's Secret 2.0 freeware. These tools require you to punch in a password every time you need to access your critical data. Although this is adequate, the danger always exists that you will forget to encrypt certain pieces of important information.

In the long term, PDAs will exploit biometric identification, using your voice, fingerprints, pulse, and other reliable aspects to transparently confirm who you are, before allowing access to your data. Because this procedure will be so simple, everything will be encrypted by default. Also, once a high-



Coming Next Issue

AI in Health Care

Over the last few years, optimism has grown that the world of medicine is finally going to be truly "online." Many believe that the answer to some of the major challenges faced by the health care community lies in computerization, and it appears that with increased networking capabilities, effective new solutions to old problems are emerging. Furthermore, both administrators as well as practitioners are becoming convinced that technology will change the face of health care, balancing improved quality of patient care with cost effective management procedures.

The role of AI in provoking and supporting these changes is of particular interest; despite AI's long history of research in the medical domain, relatively few AI systems are either currently in clinical practice or about to get there. Guest edited by Erika Rogers of California Polytechnic State University, this special issue considers the following questions: What is the changing face of health care? How does this affect AI research in this area? and What contributions can AI make

towards realizing these changes? Articles in this special issue are

- "Integrating a Knowledge-Based System for Parenteral Nutrition of Neonates into a Clinical Intranet"
- "Guardian: An Intelligent Autonomous Agent for Medical Monitoring and Diagnosis"
- "Neural Network Learning for Intelligent Patient Image Retrieval"
- "Knowledge Architectures for Patient Access to Breast-Cancer Information"
- "TraumaTIG: On-Line Decision Support for Trauma Management"
- "OSSIM: Voice-Enabled, Structured Medical Reporting"

**Intelligent
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IEEE Intelligent Systems: New name in 1998



performance wireless network is in place, your sensitive data will not even be stored on the PDA but on a secure, central server, to be downloaded and decrypted on demand and then discarded. Thus, even if you lose your PDA, it will contain no sensitive data. For instance, as you hold your PDA, it will detect your pulse and measure your fingerprints, thereby confirming your identity. It will then unlock doors, let you pay bills at a hotel or restaurant, and provide your driver's license when you rent a car.

Cryptography, when properly implemented, offers tremendous security—security well beyond what we now tolerate in

the "real world." Digitally encrypting our credit card number and storing it in a PDA, is far better than stamping it on plastic and storing it in our wallets.

All this and more. Besides these revolutionary changes, evolution will ensure that these devices steadily improve. Memory capacity will increase, as will the processing power and the performance of the wireless network. Battery life will lengthen. The screen, which is rather low-resolution at present, will become color with a very high resolution.

The future commodity

The Pilot's success is just the beginning. The market frenzy that the Pilot has created will ensure that PDAs soon incorporate all these technologies, and that they will be priced reasonably. Eventually, PDAs will be a commodity item, much like calculators or digital watches are today. The PDA will just be a rather generic conduit, a standard platform, to access all your private information, securely stored on a distant, reliable server. There will be no risk if you lose your PDA; you will just buy another one, pull out a backup, or borrow your friend's for a few minutes. You will not hesitate to give your children each a PDA, just as you give them each a packed lunch box for school. Your PDA will grant you access to all your important data and devices. Soon you will need to carry little else.

Related links

Read more about the Pilot	http://www.3com.com/palm/
Download Pilot software	http://www.palmpilotfiles.com
An excellent tutorial on GPS	http://www.trimble.com/gps/
Secret 2.0, for encrypting Pilot data	http://www.tphys.uni-heidelberg.de/~linke/pilot/secret.html
Metrowerks CodeWarrior developer's kit	http://www.metrowerks.com

Illustrations by Sally Lee; sally@sls.ics.mit.edu; <http://www.sls.ics.mit.edu/sally>.

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APPLICATION NUMBER	FILING DATE	GRP ART UNIT	FIL FEE REC'D	ATTORNEY DOCKET NO.	DRWGS	TOT CL	IND CL
09/237,609	01/25/99	2756	\$0.00	15886-318	7	21	5

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Applicant(s)

WENJUN LUO; ELAINE P. LUSHER.

Fremont, California

Pleasanton, California

FOREIGN FILING LICENSE GRANTED 02/10/99

TITLE

SYSTEM AND METHOD USING A PALM SIZED COMPUTER TO CONTROL NETWORK DEVICES

PRELIMINARY CLASS: 709

*No error -
just send another filing receipt*

DATA ENTRY BY: FLEMING, JEREMY S. TEAM: 01 DATE: 02/10/99

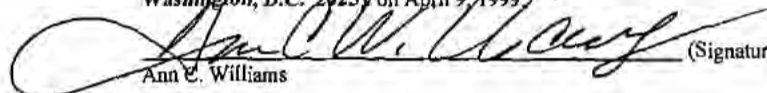
(see reverse)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:)
)
Wenjun Luo, Elaine P. Lusher) Group Art Unit: 2756
)
Application No.: 09/237,609) Examiner: Not Yet Assigned
)
Filed: 25 January 1999)
)
For: *System And Method Using A Palm Sized*)
Computer To Control Network Devices)
_____)

CERTIFICATE OF MAILING UNDER 37 C.F.R.
§ 1.8 - FIRST CLASS MAIL

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 (Signature)
Ann E. Williams

REQUEST FOR CORRECTED FILING RECEIPT

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

Sir:

Enclosed is a copy of the official Filing Receipt marked in red to identify the corrections needed. The corrections are as follows:

The city and state for each inventor should be as follows:

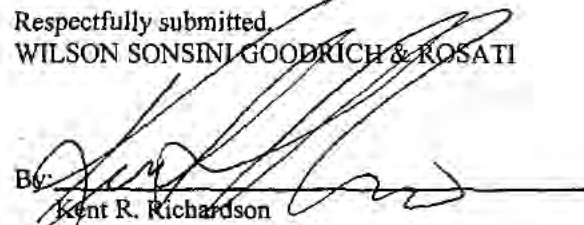
Wenjun Luo, Fremont, California; Elaine P. Lusher, Pleasanton, California.

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The Commissioner is authorized to charge the fee of \$25.00 to Deposit Account 23-2415 (15886-318). The Commissioner is authorized to charge any other fees associated with this communication to the above Deposit Account.

Respectfully submitted,
WILSON SONSINI GOODRICH & ROSATI

Dated: 4/9/99

By: 
Kent R. Richardson
Registration No. 39,443

WILSON SONSINI GOODRICH & ROSATI
650 Page Mill Road
Palo Alto, CA 94304-1505
(650)493-9300

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Patent and Trademark Office
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APPLICATION NUMBER	FILING DATE	GRP ART UNIT	FIL FEE REC'D	ATTORNEY DOCKET NO.	DRWGS	TOT CL	IND CL
09/237,609	01/25/99	2756	\$0.00	15886-318	7	21	5

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Applicant(s)

WENJUN LUO; ELAINE P. LUSHER.
↑ Fremont, California ↑ Pleasanton, California

FOREIGN FILING LICENSE GRANTED 02/10/99
TITLE
SYSTEM AND METHOD USING A PALM SIZED COMPUTER TO CONTROL NETWORK DEVICES

PRELIMINARY CLASS: 709

DATA ENTRY BY: FLEMING, JEREMY S. TEAM: 01 DATE: 02/10/99

(see reverse)



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:

Wenjun Luo, Elaine P. Lusher

Application No.: 09/237,609

Filed: 25 January 1999

For: *System And Method Using A Palm Sized
Computer To Control Network Devices*

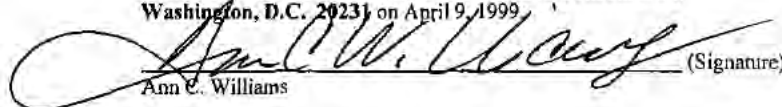


Group Art Unit: 2756

Examiner: Not Yet Assigned

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Ann C. Williams

REQUEST FOR CORRECTED FILING RECEIPT

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

Sir:

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needed. The corrections are as follows:

The city and state for each inventor should be as follows:

Wenjun Luo, Fremont, California; Elaine P. Lusher, Pleasanton, California.

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Respectfully submitted,
WILSON SONSINI GOODRICH & ROSATI

Dated: 4/9/99


By: Kent R. Richardson
Registration No. 39,443

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650 Page Mill Road
Palo Alto, CA 94304-1505
(650)493-9300

#542



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

PRE PATENT APPLICATION OF)

Wenjun Luo and)
Elaine P. Lusher)

Examiner: Not Yet Assigned

Application No.: 09/237,609)

Group Art Unit: 2756

Filing Date: 25 January 1999)

Title: **System And Method Using A Palm)
Sized Computer To Control)
Network Devices)**

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**POWER OF ATTORNEY BY ASSIGNEE
TO EXCLUSION OF INVENTOR UNDER 37 C.F.R. § 3.71
WITH REVOCATION OF PRIOR POWERS**

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

Sir:

The undersigned ASSIGNEE of the entire interest in the above-identified application for letters patent hereby appoints:

Paul Davis	29,294
John J. Bruckner	35,816
Charles C. Cary	36,764
Michael J. Murphy	37,404
David J. Weitz	38,362
Kent R. Richardson	39,443
David J. Abraham	39,554
U.P. Peter Eng	39,666
George A. Willman	41,378
Henry J. Groth	39,696
Steven J. Benerofe	41,613
Travis L. Dodd	42,491
Jinntung Su	42,174
Hayward Verdun	43,223
Van Mahamedi	42,828
Shantanu Basu	43,318
Jeffrey Wheeler	39,066

- 1 of 2 -

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Attorney Docket No.: 15886-318 (2257.CTO.US.P)

to prosecute this application and transact all business in the United States Patent and Trademark Office in connection therewith and hereby revokes all prior powers of attorney; said appointment to be to the exclusion of the inventors and the inventors' attorneys in accordance with the provisions of 37 C.F.R. § 3.71.

The following evidentiary documents establish a chain of title from the original owner to the Assignee:

- a copy of an Assignment attached hereto, which Assignment has been (or is herewith) forwarded to the Patent and Trademark Office for recording; or
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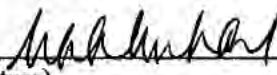
Pursuant to 37 C.F.R. § 3.73(b) the undersigned Assignee hereby states that evidentiary documents have been reviewed and hereby certifies that, to the best of ASSIGNEE's knowledge and belief, title is in the identified ASSIGNEE.

Direct all telephone calls to Kent R. Richardson, (650) 493-9300.

Address all correspondence to:

Kent R. Richardson
WILSON SONSINI GOODRICH & ROSATI
650 Page Mill Road
Palo Alto, California 94304-1050

ASSIGNEE: 3Com Corporation

Name: 
(Signature)

Name: Mark Michael
(Print or Type)

Title: Senior Vice President

Date: 5/8/99

- 2 of 2 -

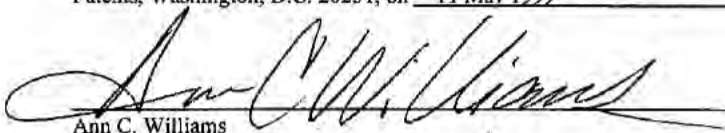
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Ann C. Williams

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PATENT
Attorney Docket No.: 15886-318

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In re Application of)
)
Wenjun Luo, Elaine P. Lusher)
)
Application No.: 09/237,609)
)
Filed: 25 January 1999)
)
For: **System And Method Using A Palm**)
 Sized Computer To Control)
 Network Devices)
_____)

Group Art Unit: 2756
Examiner: Not Yet Assigned

TRANSMITTAL LETTER

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Enclosed please find:

- Power of Attorney by Assignee to Exclusion of Inventor Under 37 C.F.R. §3.71
Revocation of Prior Powers;
- Copy of Joint to Corporate Assignment for Wenjun Luo;
- Copy of Joint to Corporate Assignment for Elaine P. Lusher.
- Charge \$ _____ to Deposit Account No. 23-2415 (Docket No. 15886-318).

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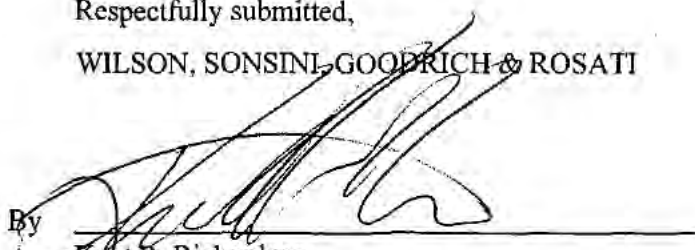
Application No.: 09/237,609
Page 2

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Respectfully submitted,

WILSON, SONSINI, GOODRICH & ROSATI

By



Kent R. Richardson
Registration No. 39,443

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Palo Alto, CA 94304-1050
(650) 493-9300

Date: May 11, 1999

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Ann C. Williams

PATENT
Attorney Docket No.: 15886-318

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of)
)
Wenjun Luo, Elaine P. Lusher)
)
Application No.: 09/237,609)
)
Filed: 25 January 1999)
)
For: **System And Method Using A Palm**)
 Sized Computer To Control)
 Network Devices)
_____)

Group Art Unit: 2756
Examiner: Not Yet Assigned

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TRANSMITTAL LETTER

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Enclosed please find:

- Power of Attorney by Assignee to Exclusion of Inventor Under 37 C.F.R. §3.71
Revocation of Prior Powers;
- Copy of Joint to Corporate Assignment for Wenjun Luo;
- Copy of Joint to Corporate Assignment for Elaine P. Lusher.
- Charge \$_____ to Deposit Account No. 23-2415 (Docket No. 15886-318).

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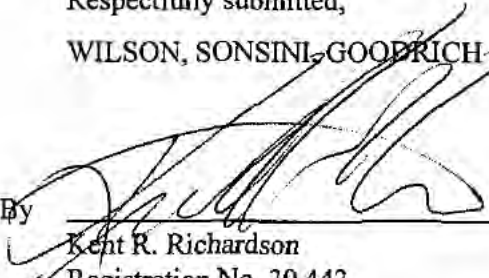
Application No.: 09/237,609
Page 2

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Respectfully submitted,

WILSON, SONSINI-GOODRICH & ROSATI

By


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Date: May 11, 1999

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application) <u>PATENT APPLICATION</u>
Inventor(s): Wenjun Luo et al.)
Application No.: 09/237,609	) Art Unit: 2756
Filed: January 25, 1999	) Examiner: Not Yet Assigned
Title: System and Method Using A Palm Sized Computer)
To Control Network Devices)

INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. §1.97

Assistant Commissioner for Patents
 Washington, D.C. 20231

Sir:

Listed below or on an attached Form PTO-1449 is information known to applicant(s). A copy of each listed publication and U.S. and foreign patent, except for pending U.S. applications, is being submitted herewith, along with a concise explanation of information in a foreign language, if any, pursuant to 37 C.F.R. §1.97-1.98.

Applicants respectfully request that the listed information be considered by the Examiner and be made of record in the above-identified application. If form PTO-1449 is enclosed, the Examiner is requested to initial and return it in accordance with MPEP §609.

This statement is not intended to represent that a search has been made or that the information cited in the statement is, or is considered to be, material to patentability as defined in §1.56.

X This statement qualifies under 37 C.F.R. §1.97, subsection (b) because (check all that apply):

- (1) It is being filed within 3 months of the application filing date
-- OR --
- (2) It is being filed within 3 months of entry of a national stage
-- OR --
- X (3) It is being filed before the mail date of the first Office Action on the merits.

37 C.F.R. §1.97(c). If this statement is being filed after the latest of: (1) three months beyond the filing date of a national application; (2) three months beyond the date of entry of the national stage as set forth in §1.491 in an international application; or (3) the mailing date of a first Office action on the merits, but before the mailing date of the earlier of a final office action under §1.113 or a notice of allowance under §1.311, then:

- a certification as specified in §1.97(e) is provided below; or
- a fee of \$240.00 as set forth in §1.17(p) is authorized below, enclosed, or included with the payment of other papers filed together with this statement.

37 C.F.R. §1.97(d). If this statement is being filed after the mailing date of the earlier of a final office action under §1.113 or a notice of allowance under §1.311, but before payment of the issue fee, then:


- A. a certification as specified in §1.97(e) is completed below; and
- B. a petition under 37 C.F.R. §1.97(d) requesting consideration of this statement is submitted herewith; and
- C. a fee of \$130.00 as set forth in §1.17(i)(1) is authorized below, enclosed, or included with the payment of other papers filed together with this statement.

X Fee Authorization. The Commissioner is hereby authorized to charge the above-referenced fees of \$ 0 and charge any additional fees or credit any overpayment associated with this communication to Deposit Account No. 23-2415 (Docket No. 15886-318).

Respectfully submitted,

WILSON SOMSINI GOODRICH & ROSATI

Date: 5/18/99.

By: 
Kent R. Richardson
Reg. No. 39,443

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**Towards Future Personalised Information
Environments**

Michael G. Lamming

Technical Report EPC-1994-104

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*Published in:
Proceedings of FRIEND21,
'94 International Symposium on Next
Generation Human Interface,
2-4 February 1994,
Meguro Gajoen, Japan.*

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Towards Future Personalised Information Environments

Michael G. Lamming

RANK XEROX RESEARCH CENTRE CAMBRIDGE

December 21, 1993

In the course of the past three or four years Sony, Kyocera, Sharp, Apple and others have defined the device we now recognise as the Personal Digital Assistant (PDA). In spite of all the publicity surrounding these devices, most offer little more than a paper-based personal organiser. Nevertheless, these are landmark products offering considerable promise as they evolve and become ever more capable. Clearly PDAs have yet to find their place in the world and when they do, I believe they will be at the centre of the next computer revolution — involving far more users than the personal computer revolution. Here's the reasoning:

Trends in technology dictate that as PDAs evolve, some will eventually become small enough to wear and take everywhere — like a watch. We will find them embedded in every sort of portable and non-portable electronic system. The cost of the portable devices will vary enormously, often reflecting their styling rather than their functionality. Indeed, economies of scale, and the pressure to standardise, suggests that it might eventually become quite hard to find a watch, cell-phone, purse or wallet which does not include the key elements of a PDA. Consider how many billion people currently wear watches. I expect a large fraction of these will soon contain a PDA.

Although very tiny, these devices will still have a user interface, plenty of storage, and the ability to communicate with other similar devices, and with the equipment and appliances in their environment. They will become a small part of an integrated personal information environment. Consequently, they will be able to monitor the user and his or her context and become intimately familiar with the user's activities. That's why we call them *intimate computers*. The more the intimate computer knows about the user, the more helpful it can be. So from here on when I say PDA, I really mean an intimate computer the size of a watch or piece of jewellery.

So what changes might we expect to see? One way to try to understand is to look back. In the early days of computing the teletype became the standard interactive device. Designers assumed this was the target interface and applications were squeezed to fit this solution space. The customer base was very small, too. So many applications we now take for granted were not economically viable back then.

The personal computer changed all that. Nowadays *it* provides the dominant solution space for application designers. Moreover, development costs can be amortised over a customer base estimated at 150 million PCs. Personal applications that were overlooked earlier are now commonplace — desktop publishing packages and personal spreadsheets are obvious examples.

So, given the huge number of potential PDA users, I expect PDAs to take over from PCs as the *dominant interactive technology*. By induction I expect to see previously unimagined applications being developed and making a profit — memory aids provide a

useful example to make my point. Memory problems are a pervasive problem at work and at home to which everyone admits, and for which there is currently little technological support. These sorts of applications provide support at the microscopic level for everyday tasks. We don't sit down to remember something in the same way that we sit down to write a report. We don't *plan* to use a memory aid. We need it around all the time.

In time the PDA could become an accoutrement we are assumed to have, like a watch. Without a watch, life can be quite challenging sometimes. So I no longer see PDAs as another PC for running applications — another class of peripheral on the radio-network. I see them as a crucial part of the world's information infrastructure — providing the functionality for collaboration between the systems and services that today often stand apart from each other in glorious isolation. Rather than being the focus of work activity PDAs will be the *oil*, lubricating the machinery of work and the flow of information. I expect PDAs will become an *integral part of the work world*, woven tightly into the complex patchwork of tasks and processes that underpin business practise. Let me give four examples of how this might happen.

PDAs will make stand-alone systems easier to use. Let us assume that most professionals will carry some form of PDA and will know how to use it. They will come to expect machinery in their environment to be able to listen, learn and respond to instructions or data emitted from their PDA — to adapt to their needs rather than vice versa. Designers of consumer electronics, office equipment and domestic appliances will probably try to build upon the experience most users will have gained from interacting with PDA-based systems, rather than asking them to learn yet another user interface paradigm. Indeed, some stationary devices may have no user interface at all, relying on the user to bring along his or her own PDA, tailored to the tasks they most frequently perform, and expressed in their own native language. We might regard this as sub-contracting out the user interface. To some extent this happens already with TVs and computer printers. It has certainly been the case in busy supermarkets for many years. Customers select what they need at their own speed and only contend for the scarce and expensive resource, the sales assistant when they have made up their mind.

PDAs will make it easier to collect information. History shows that the PC has done little to reduce the *amount* of data we have to assimilate or the time we spend doing it. On the contrary, it has increased, several fold, the number of papers, forms and messages that are generated each day. At first sight, PDAs show every sign of making the problem worse because they will accompany us everywhere, and because they provide us with the almost irresistible opportunity to sense and capture a lot more information automatically *just in case it might be useful one day*. Phone numbers dialled, names and addresses of people encountered, directions taken to unfamiliar locations, complicated procedures used, mail sent and received, TV programs watched, visual aids from meetings and lectures attended, receipts from supermarket and ATM transactions, even weather conditions endured ... The list is endless. The PDA is probably not the ideal place to interact with large bodies of information, but it does provide a convenient place to store or reference it all.

PDAs will make it easier to exchange information. A simple problem we all face is the need to exchange information with other people or systems. Often the information we need to exchange is not close to hand, or the recipient is not close to hand, or when we do actually meet, we forget to exchange it. Obviously if we can access all the information we need all of the time the problem of data exchange is made a little easier. Of course, electronic mail systems have helped a little, but even so, they often require us to meet face-to-face to figure out the correct form of e-mail address and negotiate an interchange

format. At least, when we meet, our PDAs can automate the exchange of this information. But better still, they can remind us to do it. If everyone wears an intimate computer, we can ask our PDA to be remind us to pass on some information next time we meet them. Reminding on the basis of context rather than merely time will be an important sales feature for watches of the future.

PDAs will help us organise information. If my earlier predictions are true, owners of intimate computers will be deluged with information to the extent that they will often find themselves looking for a needle in the proverbial haystack. Fortunately, the intimate computer can also provide some relief. While they may be unable to provide details about the *content* of a document to guide a retrieval request, they can often remember the *context* in which the document was received or used. As we have demonstrated with the Forget-me-not prototype, context can be a powerful retrieval key. The intimate computer provides the means to gather context keys, and may provide a practical method for retrieving information we know we once had but have now lost.

So I claim that PDAs will play a central role in the Personal Information Environment of the 21st century. But to understand the details of that role, we need to take a very careful look at the details of our work, the small processes we perform perhaps every few minutes that link together the tasks we recognise as work. I believe it's in these *gaps* that the PDA will be most useful.

Page 7, line 15: delete the words "(rather than devices)".

Page 8, line 5: after the words "use of", insert --a--.

Page 8, line 6: after the word "control", insert --is--.

Page 11, line 16: delete the word "is".

Page 11, line 16: after the word "example.", insert --Refer to Figure 1--.

Page 12, line 12: delete the word "approach", replace with the word --approaches--.

*KSR Note
w. spec.*

REMARKS

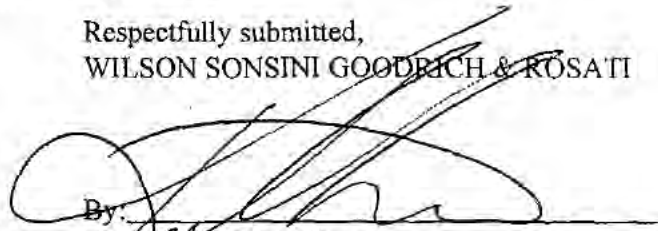
The above amendments have been made to correct clerical errors. No new matter has been added.

CONCLUSION

Applicant requests entry of this Preliminary Amendment.

Respectfully submitted,
WILSON SONSINI GOODRICH & ROSATI

Date: 12/17/99

By: 
Kent R. Richardson
Registration No. 39,443

WILSON SONSINI GOODRICH & ROSATI
650 Page Mill Road
Palo Alto, California 94304-1050
Telephone: (650) 493-9300

The following evidentiary documents establish a chain of title from the original owner to the Assignee:

- a copy of an Assignment attached hereto, which Assignment has been (or is herewith) forwarded to the Patent and Trademark Office for recording; or
- the Assignment recorded on 12 April 1999 at reel 9887, frame 0655.

Pursuant to 37 C.F.R. § 3.73(b) the undersigned Assignee hereby states that evidentiary documents have been reviewed and hereby certifies that, to the best of ASSIGNEE's knowledge and belief, title is in the identified ASSIGNEE.

Direct all telephone calls to Mark A. Haynes, (650) 712-0340.

Address all correspondence to:

Mark A. Haynes, Esq., Reg. No. 30,846
HAYNES & BEFFEL LLP
P.O. Box 366
Half Moon Bay, CA 94019

ASSIGNEE: 3Com Corporation

Signature: _____



Name: _____

Ronald B. Friedman,
Associate General Counsel & Assistant Secretary

Title: _____

Date: _____

January 21, 2000

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Amy Jonsson

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In re Application of:)	
WENJUN LUO et al.)	Group Art Unit: 2756
Application No.: 09/237,609)	Examiner: Not Yet Assigned
Filed: 25 January 1999)	
Title: System and Method Using A Palm Sized Computer To Control Network Devices)	

**POWER OF ATTORNEY BY ASSIGNEE
TO EXCLUSION OF INVENTOR UNDER 37 C.F.R. § 3.71
WITH REVOCATION OF PRIOR POWERS**

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

The undersigned ASSIGNEE of the entire interest in the above-identified application for letters patent hereby appoints:

Mark A. Haynes	30,846
Ernest J. Beffel, Jr.	43,489

to prosecute this application and transact all business in the United States Patent and Trademark Office in connection therewith and hereby revokes all prior powers of attorney; said appointment to be to the exclusion of the inventors and the inventors' attorneys in accordance with the provisions of 37 C.F.R. § 3.71.



**UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/237,609	01/25/99	LUO	W 15886-318

MARK A. HAYNES, ESQ.
HAYNES & BEFFEL, LLP
P.O. BOX 366
HALFMOON BAY CA 94019

LM01/0412

EXAMINER

VII. V	
ART UNIT	PAPER NUMBER
2758	9

DATE MAILED:
04/12/00

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

Commissioner of Patents and Trademarks

Office Action Summary

Application No. <u>09/237,609</u>	Applicant(s) <u>Uno et al</u>
Examiner <u>V. Vu</u>	Group Art Unit <u>2758</u>

—The MAILING DATE of this communication appears on the cover sheet beneath 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, such period shall, by default, 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).

Status

- Responsive to communication(s) filed on 2/4/00
- This action is FINAL.
- 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. 1 1: 453 O.G. 213.

Disposition of Claims

- Claim(s) 1-21 is/are pending in the application.
- Of the above claim(s) _____ is/are withdrawn from consideration.
- Claim(s) _____ is/are allowed.
- Claim(s) 1-21 is/are rejected.
- Claim(s) _____ is/are objected to.
- Claim(s) _____ are subject to restriction or election requirement.

Application Papers

- See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- The proposed drawing correction, filed on _____ is approved disapproved.
- The drawing(s) filed on _____ is/are objected to by the Examiner.
- The specification is objected to by the Examiner.
- The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
 - All Some* None of the CERTIFIED copies of the priority documents have been received.
 - received in Application No. (Series Code/Serial Number) _____
 - received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- *Certified copies not received: _____

Attachment(s)

- Information Disclosure Statement(s), PTO-1449, Paper No(s). 4, 6
- Notice of Reference(s) Cited, PTO-892
- Notice of Draftsperson's Patent Drawing Review, PTO-948
- Interview Summary, PTO-413
- Notice of Informal Patent Application, PTO-152
- Other _____

Office Action Summary

Serial No. 09/237,609

DETAILED ACTION

Art Rejections:

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

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.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103, the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 C.F.R. § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of potential 35 U.S.C. § 102(f) or (g) prior art under 35 U.S.C. § 103.

3. Claims 1-21 are rejected under 35 U.S.C. § 103 as being unpatentable over Want et al, hereafter Want, 5,564,070 in view of Kuzma, U.S. pat. No. 5,832,506 and Frese, II et al, hereafter Frese, U.S. pat. No. 5,909,545.

Serial No. 09/237,609

Want discloses a method of communication in a network using a palm-sized portable computer comprising:

- a) communicating with a proxy device (72, fig. 4) in the network via a wireless interface (16, fig. 4), the proxy device functions as a network gateway for the portable computer (see Want's col 8, lines 11-15),
- b) registering the Portable computer with a name/directory service (see Want's col 15, lines 12-17),
- c) communicating with other devices in the network via the proxy device.

Want does not teach in details accessing a directory of services. Such use of a directory server to provide directory of services in the network is well-known in the art as disclosed in Kuzma (see Kuzma's col 1, lines 29-52).

Want does not teach downloading software to a computer to enable remote control of a network device from the computer. Frese discloses a method of downloading software modules (Java applets) to a computer to enable remote control of an application program over a network (see Frese's col 9, line 57 - col 10, line 17).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Want with Frese's teachings because it would have enabled the portable computer to

Serial No. 09/237,609

perform remote control of an application program on a network device.

It would have been further obvious to one of ordinary skill in the art at the time the invention was made to utilize any known type of directory service including Jini lookup directory in implementing Want's invention.

Conclusion:

4. The references cited by the examiner on PTO-892 but not relied upon are considered pertinent to applicant's disclosure.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Viet Vu whose telephone number is (703) 305-9597. The examiner can normally be reached on Monday through Friday from 7:00am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ahmad Matar, can be reached on (703) 305-4731.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-9600.



**VIET D. VU
PRIMARY EXAMINER**

Art Unit 2758
4/6/00

09/237609

NOTICE OF DRAFTSPERSON'S PATENT DRAWING REVIEW

The drawing(s) filed (insert date) 1/25/99 are:

- A. [] approved by the Draftsperson under 37 CFR 1.84 or 1.152.
B. [X] objected to by the Draftsperson under 37 CFR 1.84 or 1.152 for the reasons indicated below. The Examiner will require submission of new, corrected drawings when necessary. Corrected drawing must be submitted according to the instructions on the back of this notice.

1. DRAWINGS. 37 CFR 1.84(d): Acceptable categories of drawings:
Black Ink: Color.
Color drawings are not acceptable until petition is granted. Fig(s)
Pencil and non-black ink not permitted. Fig(s)
2. PHOTOGRAPHS. 37 CFR 1.84 (b)
1 full-tone set is required. Fig(s)
Photographs not properly mounted (must use bristol board or photographic double-weight paper). Fig(s)
Four quality (half-tone). Fig(s)
3. TYPE OF PAPER. 37 CFR 1.84(e)
Paper not flexible, strong, white, and durable. Fig(s)
Erasures, alterations, overwritings, interlineations, folds, copy machine marks not accepted. Fig(s)
Mylar, vellum paper is not acceptable (too thin). Fig(s)
4. SIZE OF PAPER. 37 CFR 1.84(f): Acceptable sizes:
21.0 cm by 29.7 cm (DIN size A4)
21.6 cm by 27.9 cm (8 1/2 x 11 inches)
All drawing sheets not the same size. Sheet(s)
Drawings sheets not an acceptable size. Fig(s)
5. MARGINS. 37 CFR 1.84(g): Acceptable margins:
Top 2.5 cm Left 2.5cm Right 1.5 cm Bottom 1.0 cm
SIZE: A4 Size
Top 2.5 cm Left 2.5 cm Right 1.5 cm Bottom 1.0 cm
SIZE: 8 1/2 x 11
Margins not acceptable. Fig(s) 4, 6, 7
Top (T) Left (L)
Right (R) Bottom (B)
6. VIEWS. 37 CFR 1.84(h)
REMINDER: Specification may require revision to correspond to drawing changes.
Partial views. 37 CFR 1.84(h)(2)
Brackets needed to show figure as one entity. Fig(s)
Views not labeled separately or properly. Fig(s)
Enlarged view not labeled separately or properly. Fig(s)
7. SECTIONAL VIEWS. 37 CFR 1.84 (h)(3)
Hatching not indicated for sectional portions of an object. Fig(s)
Sectional designation should be noted with Arabic or Roman numbers. Fig(s)
8. ARRANGEMENT OF VIEWS. 37 CFR 1.84(j)
Words do not appear on a horizontal, left-to-right fashion when page is either upright or turned so that the top becomes the right side, except for graphs. Fig(s)
9. SCALE. 37 CFR 1.84(k)
Scale not large enough to show mechanism without crowding when drawing is reduced in size to two-thirds in reproduction. Fig(s)
10. CHARACTER OF LINES, NUMBERS, & LETTERS. 37 CFR 1.84(i)
Lines, numbers & letters not uniformly thick and well defined, clean, durable, and black (poor line quality). Fig(s)
11. SHADING. 37 CFR 1.84(m)
Solid black areas pale. Fig(s)
Solid black shading not permitted. Fig(s)
Shade lines, pale, rough and blurred. Fig(s)
12. NUMBERS, LETTERS, & REFERENCE CHARACTERS. 37 CFR 1.84(p)
Numbers and reference characters not plain and legible. Fig(s)
Figure legends are poor. Fig(s)
Numbers and reference characters not oriented in the same direction as the view. 37 CFR 1.84(p)(1) Fig(s)
English alphabet not used. 37 CFR 1.84(p)(2) Fig(s)
Numbers, letters and reference characters must be at least .32 cm (1/8 inch) in height. 37 CFR 1.84(p)(3) Fig(s)
13. LEAD LINES. 37 CFR 1.84(q)
Lead lines cross each other. Fig(s)
Lead lines missing. Fig(s)
14. NUMBERING OF SHEETS OF DRAWINGS. 37 CFR 1.84(i)
Sheets not numbered consecutively, and in Arabic numerals beginning with number 1. Sheet(s)
15. NUMBERING OF VIEWS. 37 CFR 1.84(u)
Views not numbered consecutively, and in Arabic numerals, beginning with number 1. Fig(s)
16. CORRECTIONS. 37 CFR 1.84(w)
Corrections not made from prior PTO-948 dated
17. DESIGN DRAWINGS. 37 CFR 1.152
Surface shading shown not appropriate. Fig(s)
Solid black shading not used for color contrast. Fig(s)

COMMENTS

REVIEWER [Signature] DATE 5/7/99 TELEPHONE NO.

ATTACHMENT TO PAPER NO.

FORM PTO-892	U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	SERIAL NO. 09/237,609	GROUP ART. UNIT 2/34 2758	ATTACHMENT TO PAPER NO. 9
NOTICE OF REFERENCES CITED		APPLICANT(S) Luo et al		

U.S. PATENT DOCUMENTS

*	DOCUMENT NO.	DATE	NAME	CLASS	SUB-CLASS	FILING DATE
A	5,923,885	7/1999	Johnson et al	395	712	
B	5,909,545	6/1999	Frese II et al	709	208	
C	5,832,506	11/1998	Kuzma	707	200	
D	5,790,977	8/1998	Ezekiel	702	122	
E	5,564,070	10/1996	Want et al.	455	507	
F						
G						
H						
I						
J						
K						

FOREIGN PATENT DOCUMENTS

*	DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS	SUB-CLASS
L						
M						
N						
O						
P						
Q						

OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, Etc.)

R	
S	
T	
U	

EXAMINER Viet Vu	DATE April 6, 2000	Form892ccs2106b
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* A copy of this reference is not being furnished with this office action.
(See Manual of Patent Examining Procedure, section 707.05(a).)

2 of 8
#10
BT
7/14/00

CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this correspondence is being faxed to Examiner Viet D. Vu at fax number (703) 305-7201, consisting of 8 pages on 12 July 2000

Amy Jonsson
Amy Jonsson 12 July 2000

Attorney No. 3COM 2257-1
2257.CTO.US.P

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)	
WENJUN LUO et al.	)	Group Art Unit: 2758
Application No. 09/237,609	)	Examiner: Viet D. Vu
Filed: 25 January 1999)	
For: System and Method Using a Palm Sized Computer to Control Network Devices)	

Official

Box Non-Fee Amendment
Assistant Commissioner for Patents
Washington, D.C. 20231

RESPONSE TO OFFICE ACTION

Sir:

This paper is submitted in response to the Office Action mailed 12 April 2000, for which a response is due to be filed by 12 July 2000. Claims 1-21 were reviewed by the Examiner and rejected. No amendments accompany this response. All claims remain pending.

On 12 July 2000, the Examiner conducted a telephonic interview, in which the section 103 rejection of all claims was discussed. Applicant appreciates the Examiner's discussion of the basis for his rejection and has been guided accordingly in preparing this response.

During the interview, applicant's undersigned attorney focused on the Frese, II et al. reference, U.S. Pat. No. 5,909,545 ("Frese") and the combination of that reference with Want et al. U.S. Pat. No. 5,564,070 ("Want"). The context and motivation of Frese were discussed. It was pointed out that Frese's invention was intended to permit previewing of software on a remote machine which could be purchased to run on the remote machine. Frese expresses a

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Application No. 09/237,609

motivation to allow a remote user to preview software before purchase; that is, a remote user could experience the look and feel of software, before purchasing it to run on the remote user's own machine. The claims of the present application were discussed, in particular the limitation of claim 1, "wherein the service controls an application that cannot be executed on the palm sized computer." It was discussed that this limitation differentiates the present invention from Frese and that Frese teaches away from palm sized remote control of a PC-based program, such as using a Palm VII to control Microsoft's PowerPoint running on a desktop computer. The Examiner acknowledged the significance of this limitation and asked Applicant to consider an additional reference listed on the Form 892, but not cited as a basis for rejection, Ezekiel U.S. Pat. No. 5,790,977.

Applicant respectfully submits that Frese does not combine with Want to support a section 103 rejection. Frese's invention was intended to permit previewing of software on a remote machine which could be purchased to run on the remote machine. Col. 1, line 19-col. 2 line 26. Frese expresses a motivation to allow a remote user to preview software before purchase; that is, a remote user could experience the look and feel of software, before purchasing it to run on the remote user's own machine. Col. 5, lines 64-67.

No motivation has been supplied by the Examiner and none is apparent to combine Frese with Want. The mobile "tab" computer in Want is described as having modest processing power and memory and having low power consumption. Col. 5, lines 29-32; col. 7, lines 3-9. In the preferred embodiment, a tab is a small stylus-based mobile computer designed to clipped onto the belt of an employee. Col. 6, lines 65-67. The mobile "tab" computer of Want is not suitable to accomplish Frese's goal of allowing a user to experience the look and feel of a program that runs on a desktop computer, before buying the program. A user trying to run Frese's application on Want's tab computer would need to scroll the tab's screen many times to view the software that the user was considering purchasing. A user would be frustrated and unlikely to buy the previewed software, if they were trying to experience its look and feel of the software on a palm sized device.

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Application No. 09/237,609

Frese teaches away from a combination with Want. Frese emphasizes the importance of experiencing the look and feel of a program before the user buys it to run on the computer that is running a browser to preview the software. Considering Frese's motivation, use of a palm sized computer would quickly be ruled out and rejected.

The present claims include limitations inconsistent with Frese's remote previewing. For instance, claim 1 is limited in lines 10-11, by the requirement that "the service controls an application that cannot be executed on the palm sized computer." An example given in the application is using a palm sized computer to control PowerPoint. It is well-known that the PowerPoint application is too resource intensive to run on a palm sized computer. A single presentation file may be larger than the entire memory of a palm sized computer. Neither the process or display of a palm sized computer is adapted to run the PowerPoint software that could be remote controlled. While Frese's remote previewing for purchase of software implies that the software which is remotely previewed can be purchased to run on the remote user's computer, this limitation requires the opposite. This limitation addresses control of an application that cannot be executed on the palm sized computer.

The Examiner suggested that Applicant also look at Ezekiel, although it was only cited on the Form 892 and not applied as a basis for rejection. Upon review, Ezekiel describes using a desktop computer to remotely control a data acquisition instrument via a socket, instead of a serial interface. Reference is made at col. 6 lines 48-67, to dynamically exporting the data received at the desktop computer to software such as LabView Analysis by National Instruments or VEE from Hewlett Packard Company (now Agilent.) Reference to dynamic linking is understood to mean that data is transferred in memory directly from the instrument control program to another software application running on the same desktop computer. Applicant researched the products referred to and confirmed that both of them run on PC-class computers, rather than palm sized computers. A brochure describing HP's VEE is available on the web at:

<http://www.tm.agilent.com/classes/MasterServlet?view=downloadablesproduct&language=eng&locale=&pro-ItemID=1000003071>

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The cover page of the brochure is attached to this response. A white paper describing LabVIEW software is available on the web at:

<http://www.ni.com/labview/what.htm>

by selecting "LabVIEW 5.0 White Paper". The cover page and page 5 of the brochure, which illustrates screens from the program, are attached to this response.

Applicant respectfully submits that the Examiner's reliance on Frese instead of Ezekiel was well-considered. Ezekiel has nothing to do with using a palm sized computer to control an application running on a host which is too large or requires too much display real estate or otherwise is incapable of running on the palm sized computer. The Examiner properly decided not to rely on Ezekiel in rejecting the claims.

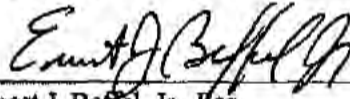
CONCLUSION

It is submitted that the present application is now in form for allowance, and such action is respectfully requested.

This response has been submitted by fax to facilitate the Examiner's review while the telephonic interview is still fresh in mind. If an additional telephone conference will in any way expedite the prosecution of this application, the Examiner is encouraged to contact the undersigned at (650) 712-0340.

Respectfully submitted,

Dated: 12 July 2000

By: 
Ernest J. Beffel, Jr., Esq.
Registration No. 43,489

Haynes & Beffel LLP
P.O. Box 366
Half Moon Bay, CA 94019
(650) 712-0340 phone
(650) 712-0263 fax

1 of 8

HAYNES & BEFFEL LLP
 PATENT, TRADEMARK & COPYRIGHT LAW
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 650-712-0340 • Fax 650-712-0263

MARK HAYNES
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ERNIE BEFFEL
ebeffel@hmbay.com

FAX NUMBER:	(703) 305-7201
TRANSMITTED TO:	Examiner Viet D. Vu
OF:	USPTO - Group Art Unit: 2758
FROM:	Ernest J. Beffel, Jr., Reg. No. 43, 489
CLIENT/MATTER:	Serial No. 09/237,609 Filed: 25 January 1999 Inventor: Wenjun Luo et al. For: System and Method Using a Palm Sized Computer To Control Network Devices
DATE:	12 July 2000

Official

TOTAL NUMBER OF PAGES INCLUDING THIS COVER SHEET: 8

**PLEASE DELIVER ON RECEIPT TO
 EXAMINER VIET D. VU.
 THANK YOU.**

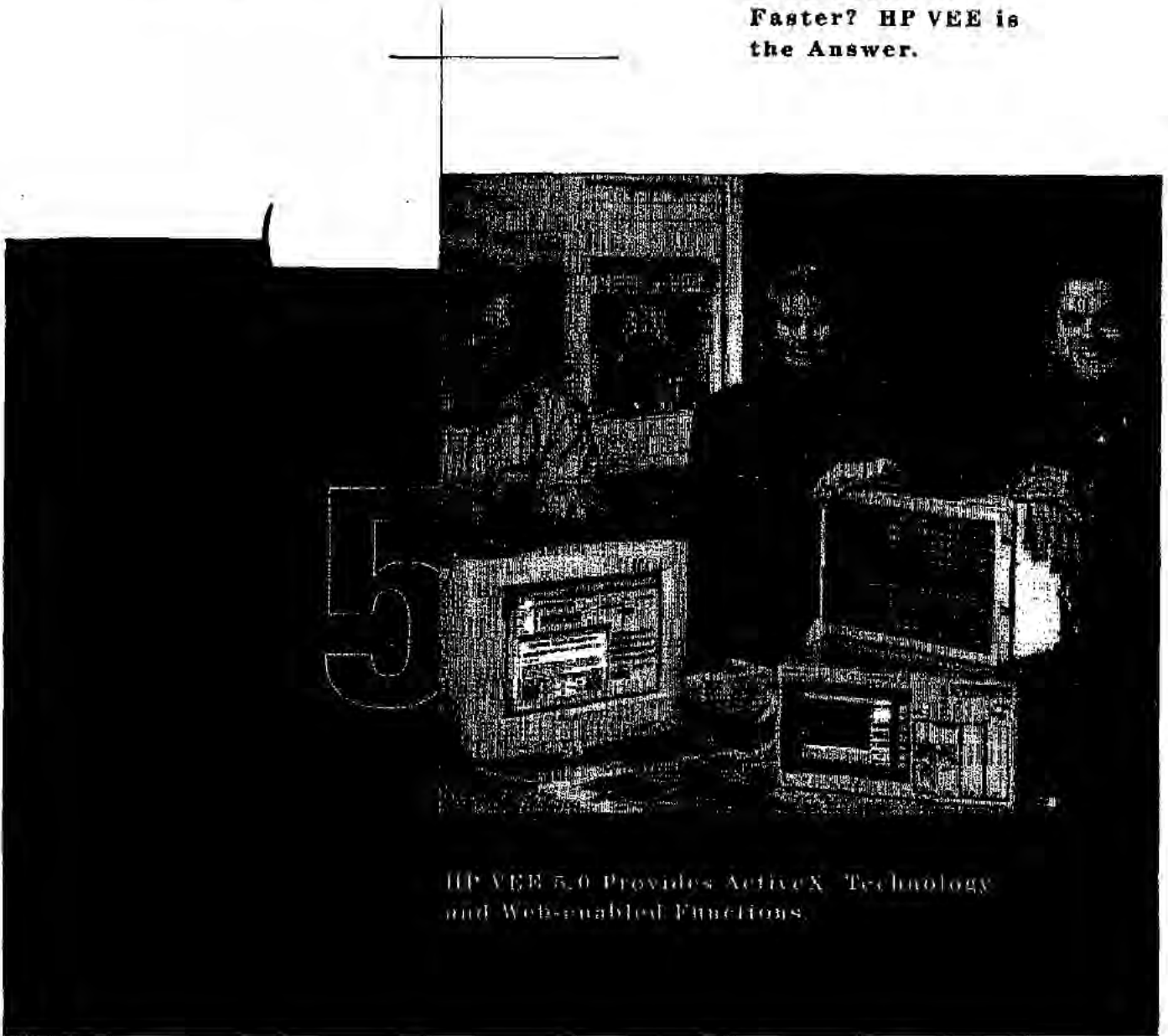
ORIGINAL:	
X	WILL NOT FOLLOW
	FOLLOWS VIA MAIL
	FOLLOWS VIA COURIER

6 of 8



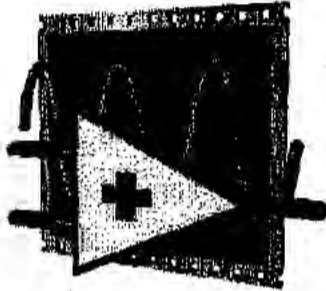
HP VEE Visual Programming Language

**Need Better Tests
Faster? HP VEE is
the Answer.**



HP VEE 5.0 Provides ActiveX Technology
and Web-enabled Functions.

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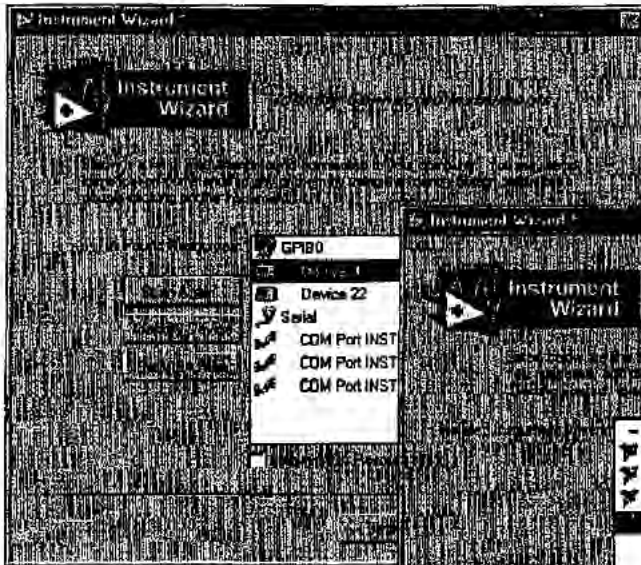
LabVIEW™ Version 5.0

The Power to Make It Simple

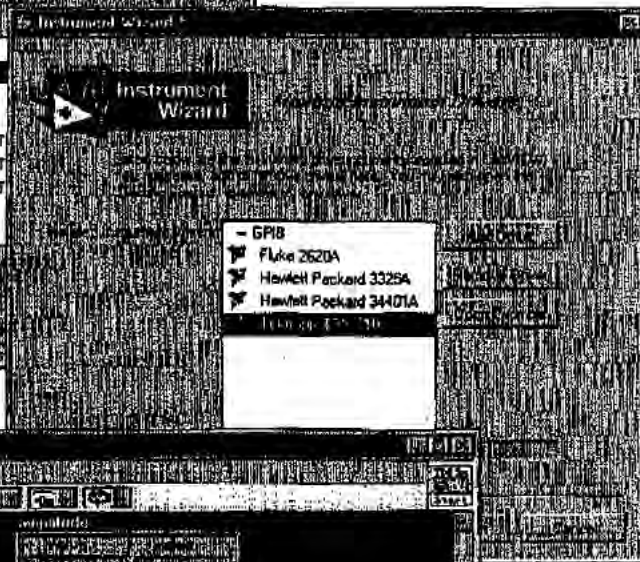


8/8

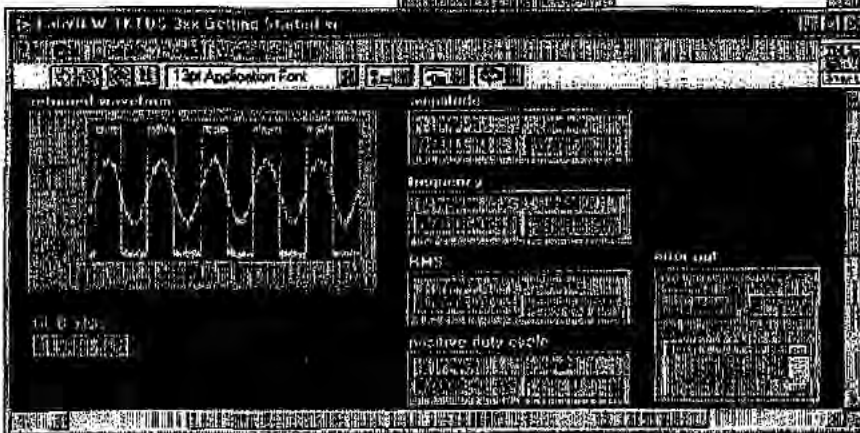
application with source code, so users do not have to sacrifice flexibility for ease of use.



Step 1. The wizard first identifies the instruments and ports in the system.



Step 2. The wizard detects and installs the necessary instrument drivers.



Step 3. The wizard generates an example for your instrument, complete with the block diagram so that it can be modified.

#10

Office Action Summary

Application No. 09/237,609	Applicant(s) Luo et al
Examiner V. Vu	Group Art Unit 8758

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

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Status

- Responsive to communication(s) filed on 7-12-00
- This action is FINAL.
- 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

- Claim(s) 1-21 is/are pending in the application.
- Of the above claim(s) _____ is/are withdrawn from consideration.
- Claim(s) _____ is/are allowed.
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- See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- The proposed drawing correction, filed on _____ is approved disapproved.
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- The specification is objected to by the Examiner.
- The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
 - All Some* None of the CERTIFIED copies of the priority documents have been received.
 - received in Application No. (Series Code/Serial Number) _____
 - received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- *Certified copies not received: _____

Attachment(s)

- Information Disclosure Statement(s), PTO-1449, Paper No(s) _____
- Notice of Reference(s) Cited, PTO-892
- Notice of Draftsperson's Patent Drawing Review, PTO-948
- Interview Summary, PTO-413
- Notice of Informal Patent Application, PTO-152
- Other _____

Office Action Summary

Serial No. 09/237,609

DETAILED ACTION

1. This office action responds to applicant's remarks filed 7/12/2000.

Art Rejections:

2. The text of 35 U.S.C. 103 not cited here can be found in the previous office action.

3. Claims 1-21 are rejected under 35 U.S.C. § 103 as being unpatentable over Want et al, hereafter Want, 5,564,070 in view of Kuzma, U.S. pat. No. 5,832,506 and Agranat et al, hereafter Agranat, U.S. pat. No. 5,973,696.

Want discloses a method of communication in a network using a palm-sized computer comprising:

a) communicating with a proxy device (72, fig. 4) in the network via a wireless interface (16, fig. 4), the proxy device functions as a network gateway for the portable computer (see Want's col 8, lines 11-15),

b) registering the Portable computer with a name/directory service (see Want's col 15, lines 12-17),

c) communicating with other devices in the network via the proxy device.

Serial No. 09/237,609

Want does not teach in details accessing a directory of services. Such use of a directory server to provide directory of services in the network is well-known in the art as disclosed in Kuzma (see Kuzma's col 1, lines 29-52).

Want does not teach remote accessing/controlling a network application. Agranat discloses a method of generating HTML codes for enabling remote control of an application program or device over the network (see Agranat's col 2, lines 15-25). The HTML codes are downloaded to and executed by client's conventional browser to provide a user interface for controlling or configuring a network application or a network device (see Agranat's col 17, lines 47-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Want with Agranat's teachings because it would have enabled users to perform remote controlling a network application/device using a conventional browser.

As to claim 5, the use JAVA applets in HTML pages is well-known in the art.

As to claims 3 and 13, it would have been further obvious to one of ordinary skill in the art at the time the invention was made to utilize any known types of directory service including Jini lookup directory in implementing Want's invention.

Serial No. 09/237,609

Response to Arguments:

4. Applicant's arguments filed 7/12/2000 are moot in view of new ground of rejection set forth above.

Conclusion:

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Viet Vu whose telephone number is (703) 305-9597. The examiner can normally be reached on Monday through Friday from 7:00am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ahmad Matar, can be reached on (703) 305-4731.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-9600.



**VIET D. VU
PRIMARY EXAMINER**

Art Unit 2758
7/19/00

FORM PTO-892		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		SERIAL NO. 09/237609	GROUP ART UNIT 2758 2154	ATTACHMENT TO PAPER NO.	
NOTICE OF REFERENCES CITED				APPLICANT(S) Luo et al			
U.S. PATENT DOCUMENTS							
*	DOCUMENT NO.	DATE	NAME	CLASS	SUB-CLASS	FILING DATE	
A	5,973,696	10/1999	Agranat et al.	345	357		
B	5,964,836	10/1999	Rowe et al.	709	221		
C							
D							
E							
F							
G							
H							
I							
J							
K							
FOREIGN PATENT DOCUMENTS							
*	DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS	SUB-CLASS	
L							
M							
N							
O							
P							
Q							
OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, Etc.)							
R							
S							
T							
U							
EXAMINER Viet Vu			DATE July 19, 2000		Form892ccs2106b		
* A copy of this reference is not being furnished with this office action. (See Manual of Patent Examining Procedure, section 707.05(a).)							

1/237,609



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
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09/237,609	01/25/99	LIID	W 15886-318
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EXAMINER

LMC1/0721

MARK A. HAYNES, ESQ.
HAYNES & BEFFEL, LLP
P.O. BOX 366
HALFMOON BAY CA 94019

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

2758 1P

DATE MAILED: 07/21/00

INTERVIEW SUMMARY

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

(1) V. V (3) _____

(2) Ernest Beffel (43,489) (4) _____

Date of Interview: 7-12-00

Type: Telephonic 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

Identification of prior art discussed: Frese v. Wiant

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

Discussed whether Frese's teachings meet claim limitation requiring remote controlling of application that cannot be executed on the portable ~~comp~~ palm sized computer.

(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.)

1. 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 RESPONSE TO THE LAST OFFICE ACTION IS NOT WAIVED AND MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a response 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.

2. Since the Examiner's interview summary above (including any attachments) reflects a complete response to each of the objections, rejections and requirements that may be present in the last Office action, and since the claims are now allowable, this completed form is considered to fulfill the response requirements of the last Office action. Applicant is not relieved from providing a separate record of the interview unless box 1 above is also checked.

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

FORM PTOL-413 (REV.1-96)

VIET D. VU
PRIMARY EXAMINER



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Sue Bromaghin
Sue Bromaghin 14 September 2000

*13/Resp
9/25/00
OK*

Attorney No. 3COM 2257-1
2257.CTO.US.P

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)
WENJUN LUO et al.)
Application No. 09/237,609)
Filed: 25 January 1999)
For: **System and Method Using a Palm Sized)
Computer to Control Network Devices**)

Group Art Unit: 2758

Examiner: Viet D. Vu

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Assistant Commissioner for Patents
Washington, D.C. 20231

RESPONSE TO OFFICE ACTION DATED 07/21/00

Sir:

This paper is submitted in response to the Office Action mailed 21 July 2000. Consideration of the following comments is respectfully requested.

Claims 1-21 were reviewed by the Examiner and rejected. No amendments accompany this response. All claims remain pending.

In the second rejection, the Examiner adopted an entirely new rationale, thereby making moot Applicants' position that the prior combination of references did not render the claimed invention obvious.

Applicants respectfully submit that the Examiner's new combination of references is guided by hindsight, rather than any express suggestion to combine the references. Applicants urged in response to the first rejection that there was no motivation to combine the Want and Frese references cited by the Examiner. This urging was apparently persuasive, as the Examiner abandoned the initial rejection and did not respond to Applicants' position. In this rejection, none of the three references cited by the Examiner provides the functionality claimed for this invention. There is no express suggestion or motivation to combine the

references. Even if the three references were combined, their combined functionality would not satisfy the elements of the independent claims.

The Examiner's base reference is Want, for a palm-sized device with a wireless connection to a server. However, Want's device does not include hardware or software necessary to perform the claimed functions of this invention. Want's tablet does not appear to include the processing power, either in a CPU or memory, necessary to provide the claimed functionality. Col. 7, lines 3-5. After all, Want's patent application was submitted in 1993, before processors and memory were reduced in size and power consumption. The Want device also lacks the software necessary to provide the claimed functionality. There is no suggestion that Want's device was capable of running a "browser" or a Java Virtual Machine, much less an operating system that would support JINI directory services. *See, e.g.*, col. 7, lines 23-54 ("you are here" software). There is no indication that Want's device was ever commercialized. It is generally recognized that early palm-sized devices such as Apple's Newton failed to gain market acceptance, even with strong backing. The first commercially successful palm-sized devices were the Palm(TM) systems. Want characterizes his invention not as a successful palm-sized computer, but as a "mechanism for providing processing continuity ...". Col. 21, lines 59-60. In summary, Want's 1993 application does not teach or enable production of a device having hardware or software capable of performing the claimed functions of this invention.

The Examiner cites Kuzma for providing a directory of available services which may be located throughout a network. However, Kuzma provides a directory of *servers*, not of *services*. There is no suggestion in Kuzma to provide a directory or description of *remotely controllable services*. The technology is illustrated as providing access among peer machines on a network. *See, e.g.*, Figs. 2-4; col. 3, lines 15-26; col. 6, lines 10-22. The peer client machines would be as capable of running any particular program or service as the peer host machines. Col. 3, lines 63-67. There is no suggestion in Kuzma for a directory of services adapted to be remotely controlled by palm-sized computers that would be unable to run the applications remotely controlled. Nor is there any suggestion or reference to downloadable code which would run on the palm-sized computer to enable remote control. The server directory of Kuzma contains URL references for registering with existing servers on a network. Col. 6, line 56 to col. 7, line 3. These references are described as pointing to forms, static pages or to meta-pages. While a directory of *servers* sounds somewhat like a directory of *services* which could be remotely controlled, Kuzma neither suggests nor enables

Application No. 09/237,609

construction of a directory of services with reference to downloadable program code for remotely controlling other programs.

The Agranat et al. reference is cited by the Examiner for HTML as a downloadable remote control technology. However, nothing in this reference suggests a remote control technology for a palm-sized device which is not capable of executing the remotely controlled application. The object of Agranat et al. is to provide dynamic content using a specialized server and development environment in cooperation with a conventional browser. Col. 15, lines 48-60 & col. 16, lines 28-43. Serving dynamic content in the manner described by Agranat et al. is not the same as remotely controlling an application that cannot be executed on a palm-sized computer.

Thus, by looking at each of the three references cited, it is clear that none of them provides their respective parts of the functionality which the Examiner proposes to assemble by combining the references. Want does not provide or enable a palm-sized computer capable of remotely controlling an application. Kuzma does not provide a directory of services, including reference to downloadable program code for remotely controlling a program. Agranat et al. provide a dynamic content server, not remote control of applications that could not ordinarily run on a palm-sized device. Taken one at a time, none of the references enables the respective part of the claimed functionality that they are supposed to provide when combined. Moreover, there is no suggestion to combine these references.

The Examiner's statement of motivation to combine references rings of the hindsight is so easy to indulge and so essential to avoid. *See* MPEP § 2143.01. The Examiner asserts that a person of ordinary skill would be motivated to combine the cited references because it would enable remote control of an application using a palm-sized computer. In making this assertion, the Examiner is taking what the applicants invented and using it as a template to combine references which do not include any explicit or implicit suggestion for combination.

There is no suggestion to combine Want's limited device with either of the other references cited. Want itself does not provide any suggestion for combination with the other, later references; again, the thrust of Want is uninterrupted communication with a mobile device. The Kuzma reference does not provide any suggestion for combination with Want. The general function of Kuzma is to provide a directory of HTTP servers, including peer machines, which can be accessed by a conventional browser. Multiple references to the use of Kuzma's directory by co-workers and peer machines do not suggest, and tend to lead away from, creating a directory for limited devices to access services which can be remotely

Application No. 09/237,609

controlled. Similarly, the Agranat et al. reference suggests at least a Windows CE machine to run a browser capable of receiving dynamic content. Col. 17, lines 51-53. The limited device described in Want is not nearly as powerful as a Windows CE machine. Nothing in the references comes close to suggesting a three-way combination.

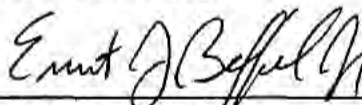
Combining the Want, Kuzma and Agranat references would be like the old joke of asking a committee to design a horse and instead ending up with a camel. A user carrying Want's device could walk from room to room, running the "you are here" program to find one of Kuzma's PCs (which doubles as a server and browser client) and sit down at the PC to access dynamic content served by another of Kuzma's peer PCs using Arganat et al.'s dynamic content technology. Without using the claimed invention as a road map for combining Want, Kuzma and Agranat, the combination of technologies would not look anything like what Applicants claim. Even using the claim as a template for combining references, the combined references are not capable of providing the claimed functionality because each of the references falls short of the functionality that it is supposed to provide.

References aside, the Examiner's rejection of 21 July 2000 makes several assertions regarding what is well-known. Pursuant to MPEP § 2144.03, Applicants respectfully seek the Examiner's amplification on his basis for asserting that various components of the claimed technology were well-known in the art at the time they were combined by these inventors.

CONCLUSION

It is submitted that the present application is in form for allowance, and such action is respectfully requested. If an additional telephone conference will in any way expedite the prosecution of this application, the Examiner is encouraged to contact the undersigned at (650) 712-0340.

Respectfully submitted,



Ernest J. Beffel, Jr., Esq.
Reg. No. 43,489

Dated: 14 September 2000

Haynes & Beffel LLP
P.O. Box 366
Half Moon Bay, CA 94019
(650) 712-0340 phone
(650) 712-0263 fax



2758

CERTIFICATE OF MAILING
I hereby certify that this correspondence is being deposited with the U.S. Postal Service with sufficient postage as first class mail in an envelope addressed to: Box Non-Fee Amendment, Assistant Commissioner for Patents, Washington, D.C. 20231, on 14 September 2000

Sue Bromaghin
Sue Bromaghin 14 September 2000

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Attorney No. 3COM 2257-1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)	
WENJUN LUO et al.	)	Group Art Unit: 2758
Application No. 09/237,609)	
Filed: 25 January 1999	)	Examiner: Viet D. Vu
For: System and Method Using a Palm Sized)	
Computer to Control Network Devices)	

Box Non-Fee Amendment
Assistant Commissioner for Patents
Washington, D.C. 20231

TRANSMITTAL OF RESPONSE TO OFFICE ACTION DATED 07/21/00

Sir:

In connection with the above-referenced U.S. patent application, transmitted herewith are the following papers:

- Response to Office Action, for which no fee is due.
- A Petition for Extension of Time is also enclosed, and the fee due for the Extension of Time is:

Authorization is given to charge the Deposit Account of the undersigned (Account No. 50-0869 / 3COM 2257-1), or credit any payment thereto, any additional fees associated with this document. This authorization is provided in duplicate.

Dated: 14 September 2000
Haynes & Beffel LLP
P.O. Box 366
Half Moon Bay, CA 94019
(650) 712-0340 phone
(650) 712-0263 fax

Respectfully submitted,
Ernest J. Beffel, Jr.
Ernest J. Beffel, Jr., Esq.
Registration No. 43,489



CERTIFICATE OF MAILING

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Sue Bromaghin

Sue Bromaghin 14 September 2000

Attorney No. 3COM 2257-1
2257.CTO.US.P

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)
WENJUN LUO et al.)
Application No. 09/237,609)
Filed: 25 January 1999)
For: **System and Method Using a Palm Sized)
Computer to Control Network Devices**)

Group Art Unit: 58)
Examiner: Viet D. Vu)

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Box Non-Fee Amendment
Assistant Commissioner for Patents
Washington, D.C. 20231

TRANSMITTAL OF RESPONSE TO OFFICE ACTION DATED 07/21/00

Sir:

In connection with the above-referenced U.S. patent application, transmitted herewith are the following papers:

- Response to Office Action, for which no fee is due.
- A Petition for Extension of Time is also enclosed, and the fee due for the Extension of Time is:

Authorization is given to charge the Deposit Account of the undersigned (Account No. 50-0869 / 3COM 2257-1), or credit any payment thereto, any additional fees associated with this document. This authorization is provided in duplicate.

Respectfully submitted,

Ernest J. Bffel, Jr.
Ernest J. Bffel, Jr., Esq.
Registration No. 43,489

Dated: 14 September 2000

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#14/B
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6/17/00

CERTIFICATE OF FACSIMILE TRANSMISSION
I hereby certify that this correspondence is being faxed to Examiner Viet D. Vu
at fax number (703) 305-7201, consisting of 4 pages on 15 November 2000
Amy Jonsson
Amy Jonsson 15 November 2000

Attorney No. 3COM 2257-1
2257.CTO.US.P

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)
WENJUN LUO et al.) Group Art Unit: 2758
Application No. 09/237,609) Examiner: Viet D. Vu
Filed: 25 January 1999)
For: System and Method Using a Palm Sized)
Computer to Control Network Devices)

Box Non-Fee Amendment
Assistant Commissioner for Patents
Washington, D.C. 20231

VOLUNTARY AMENDMENT TO EXPEDITE ISSUANCE

Examiner Vu:

This paper is submitted in response to a telephonic interview in which the Examiner indicated that he would readily allow this patent application if the claims were directed to a palm sized device or controller. Applicants now make the requested amendments, subject to the meaning of "palm sized" discussed prior to amendment, without prejudice to the already pending continuation-in-part application.

Consideration of the following comments is respectfully requested.

Claims 1-21 have been twice reviewed by the Examiner and rejected. No previous amendments have been made. This amendment addresses claims 8-13, 17 and 20. All claims remain pending, except claim 18 which is cancelled.

AMENDMENTS TO THE CLAIMS

- 1 8. (amended) A method of controlling a program on a network device from a palm sized
- 2 computer, the computer is not capable of executing the program by itself, the network
- 3 device and computer being coupled in communications via a network, the method
- 4 comprising:

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Application No. 09/237,609

5 accessing a directory of services, a service in the directory of services corresponding to
 6 the program, the description of the service including at least a reference to program
 7 code for controlling the service;
 8 loading the program code;
 9 issuing control commands to the network device using the program code, the control
 10 commands causing the network device to control the program.

B
1

1 9. (amended) The method of claim 8, wherein loading the program code includes loading the
 2 program code onto the palm sized computer and the issuing the control commands
 3 includes the palm sized computer issuing the control commands.

1 10. (amended) The method of claim 8, wherein a proxy device is coupled to the network and
 2 wherein accessing the directory of services includes the palm sized computer accessing
 3 the proxy device, and the proxy device accessing the directory of services, and wherein
 4 the loading the program code includes loading the program code onto the proxy device,
 5 and wherein the issuing the control commands includes the palm sized computer issuing
 6 a set of first set of commands to the proxy device and the proxy device issuing the control
 7 commands.

1 11. (amended) The method of claim 10, wherein the program code includes a user interface
 2 program and wherein the proxy device receives the user interface program and generates
 3 a second user interface for the palm sized computer.

1 12. (amended) The method of claim 8 wherein loading the program code includes loading the
 2 program code onto the palm sized computer from the directory of services.

1 13. (amended) The method of claim 8, wherein the palm sized computer includes a Palm OS
 2 compatible computer, wherein the program code includes Java code and wherein the
 3 directory of services includes a Jini directory of services.

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1 17. (amended) A system for controlling a network service comprising:
 2 a network based computer service for controlling an application that cannot be executed
 3 by [the] a control device;

Application No. 09/237,609

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2

- 4 a directory of services including a registry of services, each service in the registry of
- 5 services corresponding to a service on the network;
- 6 [a] the control device having a program for sending control commands to the network
- 7 based computer service, the program being loaded onto the control device as a result
- 8 of locating a reference to the network based computer service in the directory of
- 9 services;
- 10 a network coupled in communications with the network based computer service, the
- 11 directory of services and the control device;
- 12 wherein the control device includes a palm sized computer having an operating system,
- 13 a network communications program, a protocol program for communicating with the
- 14 directory of services and wherein the program includes a graphical user interface.

B
3

- 1 ¹⁹ 20. (amended) A method for controlling a service in a network using a palm sized computer, the
- 2 method comprising:
- 3 accessing a description of a service, the description of the service including at least a
- 4 reference to program code for controlling the service;
- 5 downloading the program code;
- 6 executing at least a portion of the program code; and
- 7 sending control commands to the service in response to the executing, wherein the service
- 8 includes a CPU service.

DISCUSSION OF INTERVIEWS AND AMENDMENTS

The interviews leading to this amendment included brief exchanges of voice mail and two brief conversations on or about October 26, 2000 and approximately a week later. In a voice mail and in the initial conversation, the Examiner indicated that all claims would be allowable immediately if they included reference to a palm sized computer or controller. Thus, claims 1-7 and dependant claim 18 were allowable in their original form, without amendment. In the second conversation, Examiner and applicant discussed the scope or meaning of "palm sized" which would apply if the claims were amended. It was agreed that this amendment would record that "palm sized" includes both handheld devices the size of Palm Pilots™ and handheld Windows CE™ devices such as the HP sub notebook size devices.

To avoid any confusion regarding the resulting scope of these claims after amendment,

Application No. 09/237,609

applicant respectfully submits that "palm sized" has the meaning discussed by the Examiner and applicant prior to amendment. It includes devices the size of Casio Cassiopeia™ (nominally 5.11 x 3.26 x 0.78 inches), Compaq Aero™ (5.27 x 3.34 x 0.78), Everex Freestyle™ (4.8 x 3.2 x 0.7), HP Jornadas™ (5.1 x 3.2 x 0.9) and (1.3 x 7.4 x 3.7), NEC MobilePro™ (1.1 x 9.6 x 5.2), and Phillips Nino™ (5.25 x 3.41 x 0.75). These dimensions are taken from product review entries in the on-line version of PC Magazine.

Claims 1-7 remain unamended. It is intended that the scope of the doctrine of equivalents for these unamended claims will not be restricted by amendment of other claims to incorporate limitations similar to those found in claims 1-7, which are allowable without amendment.

Claim 17 is amended to incorporate the limitation of claim 18, which was allowable without amendment.

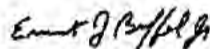
Claims 8-13 and 20 are amended consistent with the claims that were allowable without amendment. The term "palm sized" has been added to these claims, intended to have the scope set forth above and a reasonable range of equivalents, as would be afforded to the claims 1-7 and 18 which were allowable without amendment.

It is respectfully submitted that claim 21 should be allowable without amendment as it is written in a means plus form format.

CONCLUSION

It is submitted that the present application is in form for allowance, and such action is respectfully requested. If an additional telephone conference will in any way expedite the prosecution of this application, the Examiner is encouraged to contact the undersigned at (650) 712-0340 or by cell phone at (415) 902-6112.

Respectfully submitted,



Ernest J. Beffel, Jr., Esq.
Reg. No. 43,489

Dated: 15 November 2000

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MARK HAYNES
 ERNIE BEFFEL

JIM HANN
Of Counsel



FACSIMILE TRANSMITTAL FORM

FAX NUMBER:	(703) 305-7201
TRANSMITTED TO:	Examiner Viet D. Vu
OF:	USPTO - Group Art Unit:
FROM:	Ernest J. Beffel, Jr.
CLIENT/MATTER:	Serial No. 09/237,609 Filed: 25 January 1999 Inventor: Wenjun Luo et al. For: System and Method Using a Palm Sized Computer to Control Network Devices
DATE:	15 November 2000

TOTAL NUMBER OF PAGES INCLUDING THIS COVER SHEET: **5**

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 EXAMINER VIET D. VU.
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11/15/2000
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PALM INTRANET

Serial Number Information

Serial Number : 09/237609

Filing Date : 01/25/1999

Application Received : 01/25/1999

Patent Number :

Issue Date : 00/00/0000

Date of Abandonment : 00/00/0000

Attorney Docket Number : 15886-318

Status : 071 / RESPONSE TO NON-FINAL OFFICE ACTION
ENTERED AND RELEASED TO EXAMINER

Location : 211N/No Location Definition

Charge to Location : 21X1/TC-2100 Examiner of Record

Charge to Name : VU, VIET D

Title of Invention :

**SYSTEM AND METHOD USING A PALM SIZED COMPUTER TO CONTROL
NETWORK DEVICES**

Examiner Number : 71525/VU, VIET D

Group Art Unit : 2154

Class/Subclass :
709/200.000

Lost Case : NO

Interference Number :

Unmatched Petition :
NO

L&R Code : 01

Status Date : 09/25/2000

Location Date : 10/19/2000

4R19

Serial [Contents](#) [Details](#) [Attorney/Agent Info](#) [Continuity Data](#) [Foreign Data](#) [Inv](#)
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**UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/237,609	01/25/99	LUO	W 15886-318

MARK A. HAYNES, ESQ.
HAYNES & BEFFEL, LLP
P.O. BOX 365
HALFMOON BAY CA 94019

TM31/1121

EXAMINER

VU, V

ART UNIT PAPER NUMBER

2154


DATE MAILED: 11/21/00

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

Commissioner of Patents and Trademarks

Notice of Allowability

Application No. 09/237,609	Applicant(s) Luo et al
Examiner Viet Vu	Group Art Unit 2154



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 and Issue Fee Due or other appropriate communication will be mailed in due course.

This communication is responsive to Supplemental Amendment "b" filed 11/15/2000

The allowed claim(s) is/are 1-17 and 19-21

The drawings filed on _____ are acceptable.

Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

- All Some* None of the CERTIFIED copies of the priority documents have been
 - received.
 - received in Application No. (Series Code/Serial Number) _____
 - received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

A SHORTENED STATUTORY PERIOD FOR RESPONSE to comply with the requirements noted below is set to EXPIRE THREE MONTHS FROM THE "DATE MAILED" of this Office action. Failure to timely comply will result in ABANDONMENT of this application. Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL APPLICATION, PTO-152, which discloses that the oath or declaration is deficient. A SUBSTITUTE OATH OR DECLARATION IS REQUIRED.

Applicant MUST submit NEW FORMAL DRAWINGS

- because the originally filed drawings were declared by applicant to be informal.
- including changes required by the Notice of Draftsperson's Patent Drawing Review, PTO-948, attached hereto or to Paper No. 9.
- including changes required by the proposed drawing correction filed on _____, which has been approved by the examiner.
- including changes required by the attached Examiner's Amendment/Comment.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the reverse side of the drawings. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Any response to this letter should include, in the upper right hand corner, the APPLICATION NUMBER (SERIES CODE/SERIAL NUMBER). If applicant has received a Notice of Allowance and Issue Fee Due, the ISSUE BATCH NUMBER and DATE of the NOTICE OF ALLOWANCE should also be included.

Attachment(s)

- Notice of References Cited, PTO-892
- Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- Notice of Draftsperson's Patent Drawing Review, PTO-948
- Notice of Informal Patent Application, PTO-152
- Interview Summary, PTO-413
- Examiner's Amendment/Comment
- Examiner's Comment Regarding Requirement for Deposit of Biological Material
- Examiner's Statement of Reasons for Allowance

Serial Number: 09/237,609
Art Unit: 2154

Examiner's Amendment

1. An Examiner's Amendment to the record appears below to cancel claim 18 as indicated in applicant's remarks. Should the changes be unacceptable to applicant, an amendment may be filed as provided by 37 C.F.R. § 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the Issue Fee.

2. The application has ~~been~~ amended as follows:
Cancel claim 18.

Any comments considered necessary by applicant must be submitted no later than the payment of the Issue Fee and, to avoid processing delays, should preferably **accompany** the Issue Fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Serial Number: 09/237,609
Art Unit: 2154

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to V. Vu whose telephone number is (703) 305-9597.



VIET D. VU
PRIMARY EXAMINER

V. Vu
11/20/00



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

NOTICE OF ALLOWANCE AND ISSUE FEE DUE

TMO/1121

MARK A. HAYNES, ESQ.
HAYNES & BEFFEL, LLP
P.O. BOX 366
HALEMOON BAY CA 94019

APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
09/237,689	01/25/99	020	VU, V	2154 11/21/00
First Named Applicant	LUD,	35 USC 154(b) term ext. =		0 Days.

TITLE OF INVENTION SYSTEM AND METHOD USING A PALM SIZED COMPUTER TO CONTROL NETWORK DEVICES

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
0 15886-318	709-217.000	V37	UTILITY	NO	\$1240.00	02/21/01

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED.

THE ISSUE FEE 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.

HOW TO RESPOND 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: <ul style="list-style-type: none"> A. If the status is changed, pay twice the amount of the FEE DUE shown above and notify the Patent and Trademark Office of the change in status, or B. If the status is the same, pay the FEE DUE shown above. 	If the SMALL ENTITY is shown as NO: <ul style="list-style-type: none"> A. Pay FEE DUE shown above, or B. File verified statement of Small Entity Status before, or with, payment of 1/2 the FEE DUE shown above.
---	--
- II. Part B-Issue Fee Transmittal should be completed and returned to the Patent and Trademark Office (PTO) with your ISSUE FEE. Even if the ISSUE FEE has already been paid by charge to deposit account, Part B Issue Fee Transmittal should be completed and returned. If you are charging the ISSUE FEE to your deposit account, section "4b" of Part B-Issue Fee Transmittal should be completed and an extra copy of the form should be submitted.
- III. All communications regarding this application must give application number and batch number. Please direct all communications prior to issuance to Box 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.

PATENT AND TRADEMARK OFFICE COPY

ART 8 - ISSUE FEE TRANSMITTAL

Complete and mail this form, together with applicable fees, to: **Box ISSUE FEE
Assistant Commissioner for Patents
Washington, D.C. 20231**

BS

MAILING INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE. Blocks 1 through 4 should be completed where appropriate. All further correspondence including the Issue Fee Receipt, 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.

Note: The certificate of mailing below can only be used for domestic mailings of the Issue Fee 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.

Certificate of Mailing

I hereby certify that this Issue Fee Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Box Issue Fee address above on the date indicated below.

Amy Jonsson (Depositor's name)
Amy Jonsson (Signature)
15 February 2001 (Date)

CURRENT CORRESPONDENCE ADDRESS (Note: Legibly make-up with any corrections or use Block 1)

MARK A. HAYNES, ESQ.
HAYNES & BEFFEL, LLP
P.O. BOX 366
HALFMOON BAY CA 94019



APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
09/237,609	01/25/99	020	VU, V	2154 11/21/00
First Named Applicant	LUO,		35 USC 154(b) term ext. = 0 Days.	

TITLE OF INVENTION: SYSTEM AND METHOD USING A PALM SIZED COMPUTER TO CONTROL NETWORK DEVICES

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
3COM 2257-1	709-217.000	V37	UTILITY	NO	\$1240.00	02/21/01

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363). Use of PTO form(s) and Customer Number are recommended, but not required.

- 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) attached.

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 Mark A. Haynes
- 2 Haynes & Beffel LLP
- 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. Inclusion of assignee data is only appropriate when an assignment has been previously submitted to the PTO or is being submitted under separate cover. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE 3COM Corporation
(B) RESIDENCE (CITY & STATE OR COUNTRY) Santa Clara, CA

Please check the appropriate assignee category indicated below (will not be printed on the patent)
 Individual corporation or other private group entity government

4a. The following fees are enclosed (make check payable to Commissioner of Patents and Trademarks):

- Issue Fee Check No. 1133
- Advance Order - # of Copies 10

4b. The following fees or deficiency in these fees should be charged to:

DEPOSIT ACCOUNT NUMBER 50-0869 (3COM 2257-1)
(ENCLOSE AN EXTRA COPY OF THIS FORM)
 Issue Fee
 Advance Order - # of Copies

The COMMISSIONER OF PATENTS AND TRADEMARKS IS requested to apply the Issue Fee to the application identified above.

(Authorized Signature) *[Signature]* (Date) 2-15-01

NOTE: The Issue Fee 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 Patent and Trademark Office. Mark A. Haynes Reg. No. 30,846

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending on the needs of the individual case. Any comments on the amount of time required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, D.C. 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND FEES AND THIS FORM TO: Box Issue Fee, Assistant Commissioner for Patents, Washington D.C. 20231

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02/21/2001 MHARMOL1 00000009 09237609
01 FC:142 1240.00 OP
02 FC:561 30.00 OP

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Arne Jonsson
Arne Jonsson 15 February 2001

Attorney No. 3COM 2257-1
2257.CTO.US.P

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)	
WENJUN LUO et al.	)	Group Art Unit: 2154
Application No. 09/237,609)	
Filed: 25 January 1999	)	Examiner: Viet D. Vu
For: System and Method Using a Palm Sized Computer to Control Network Devices)	

Box Issue Fee
Commissioner of Patents
Washington, D.C. 20231

SUBMISSION OF FORMAL DRAWINGS

Sir:

In response to the Notice of Allowability mailed 21 November 2000, enclosed are seven (7) sheets of corrected formal drawings.

Also enclosed are:

- Issue Fee Transmittal and Check No. 1133 in the amount of 1,270.00.

The Commissioner is hereby authorized to charge any additional fees which may be required by this paper or to credit any overpayment, to Deposit Account No. 50-0869 (3COM 2257-1). This paper is submitted in duplicate.

Respectfully submitted,

Mark A. Haynes
Mark A. Haynes, Esq.
Registration No. 30,846

Dated: 15 February 2001
Haynes & Beffel LLP
P.O. Box 366
Half Moon Bay, CA 94019
(650) 712-0340 phone
(650) 712-0263 fax

11.00

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Amy Jonsson 15 February 2001

Attorney No. 3COM 2257-1
2257.CTO.US.P



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)	
WENJUN LUO et al.	)	Group Art Unit: 2154
Application No. 09/237,609	)	Examiner: Viet D. Vu
Filed: 25 January 1999)	
For: System and Method Using a Palm Sized Computer to Control Network Devices)	

Box Issue Fee
Commissioner of Patents
Washington, D.C. 20231

SUBMISSION OF FORMAL DRAWINGS

Sir:

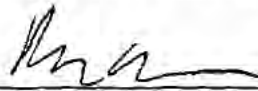
In response to the Notice of Allowability mailed 21 November 2000, enclosed are seven (7) sheets of corrected formal drawings.

Also enclosed are:

- Issue Fee Transmittal and Check No. 1133 in the amount of 1,270.00.

The Commissioner is hereby authorized to charge any additional fees which may be required by this paper or to credit any overpayment, to Deposit Account No. 50-0869 (3COM 2257-1). This paper is submitted in duplicate.

Respectfully submitted,



Mark A. Haynes, Esq.
Registration No. 30,846

Dated: 15 February 2001
Haynes & Beffel LLP
P.O. Box 366
Half Moon Bay, CA 94019
(650) 712-0340 phone
(650) 712-0263 fax

09/237,609

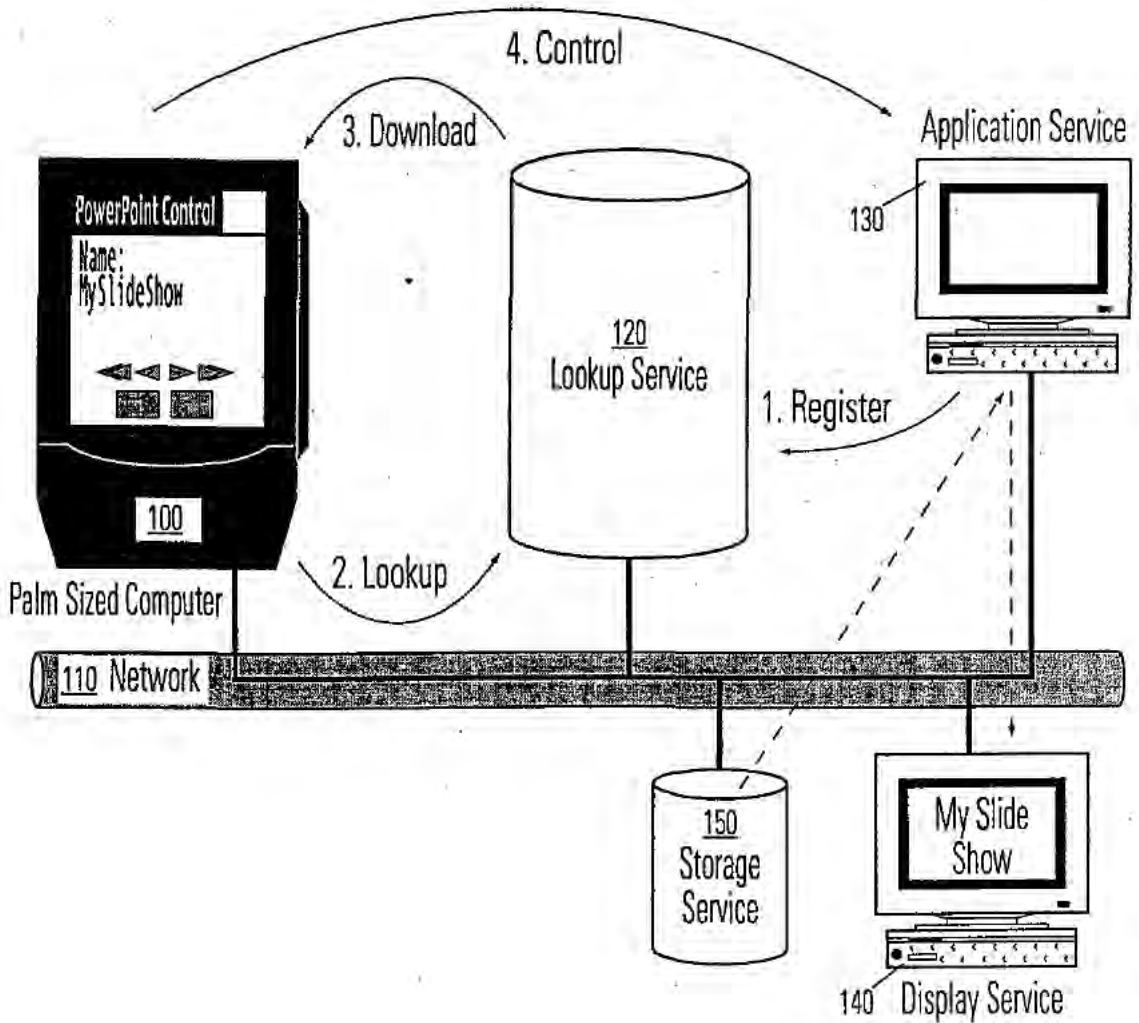


FIG. 1

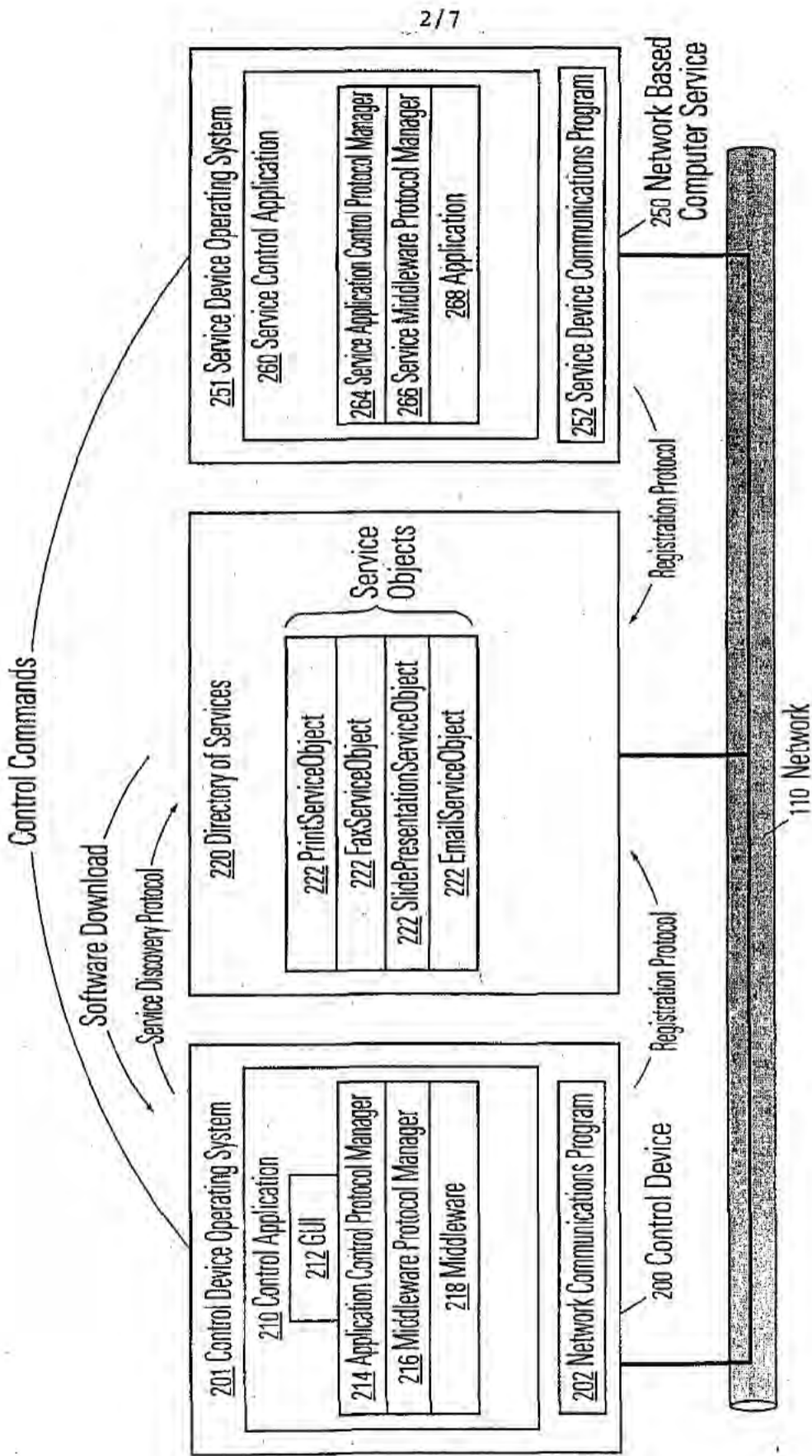


FIG. 2

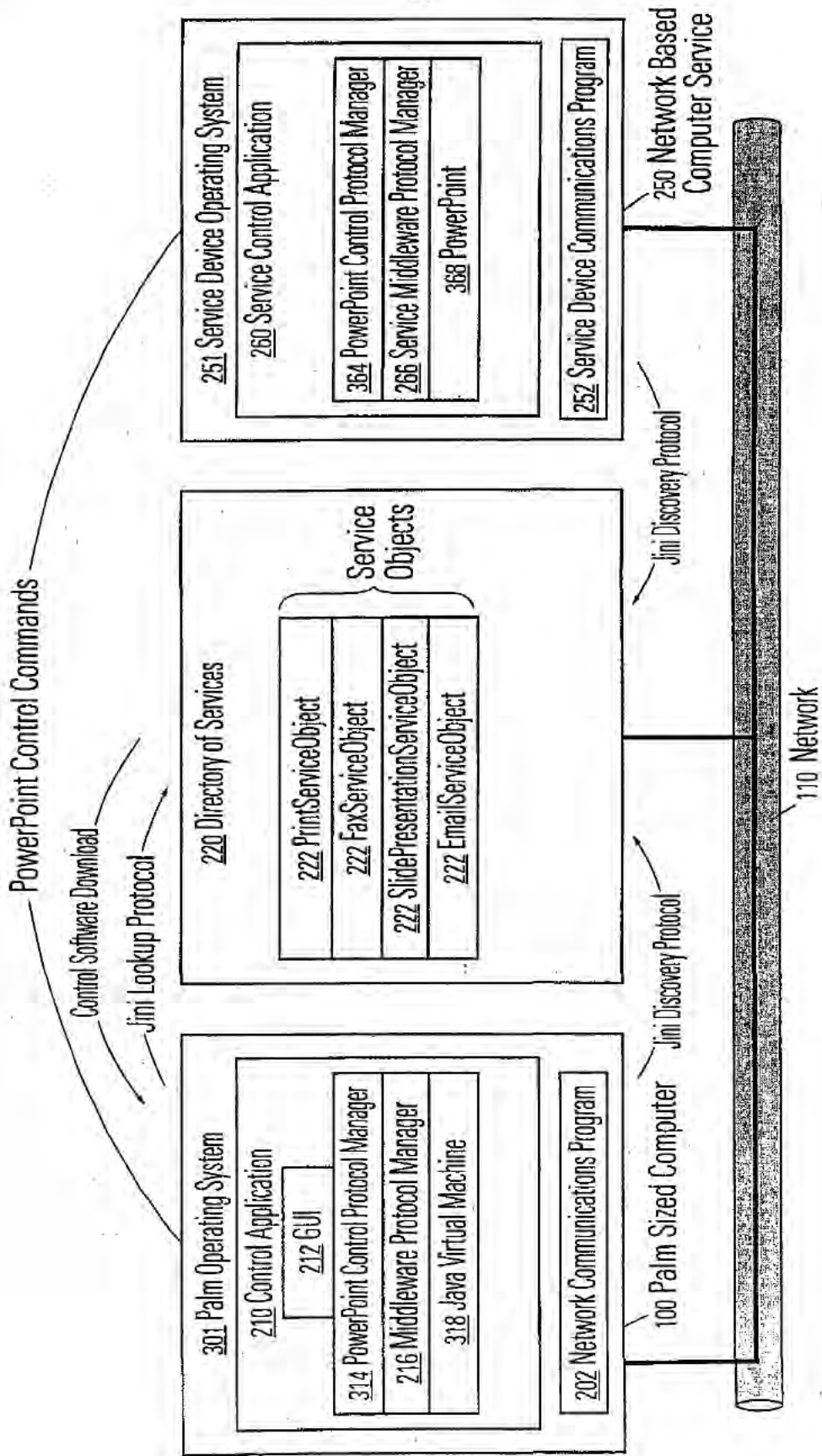


FIG. 3

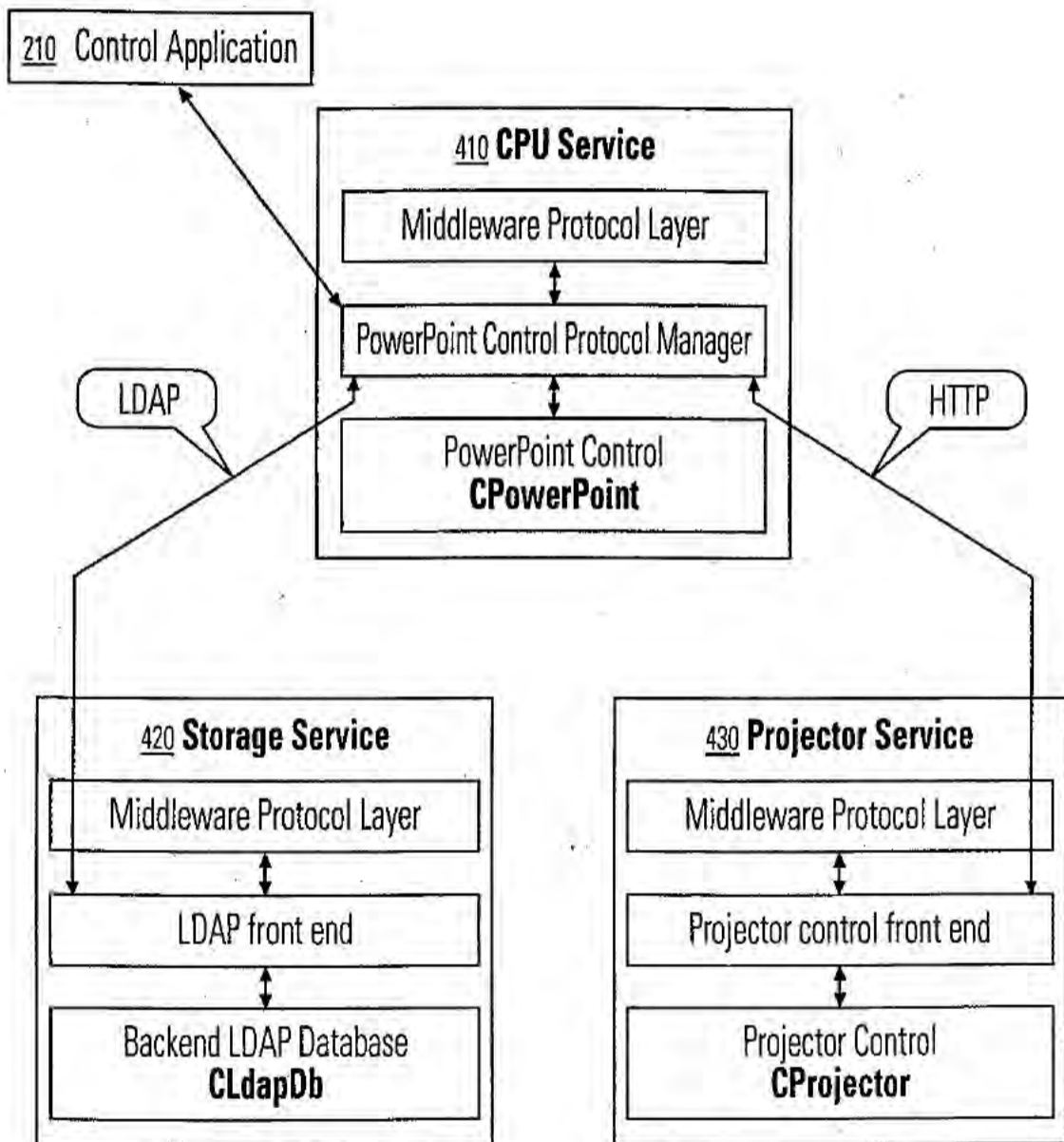


FIG. 4

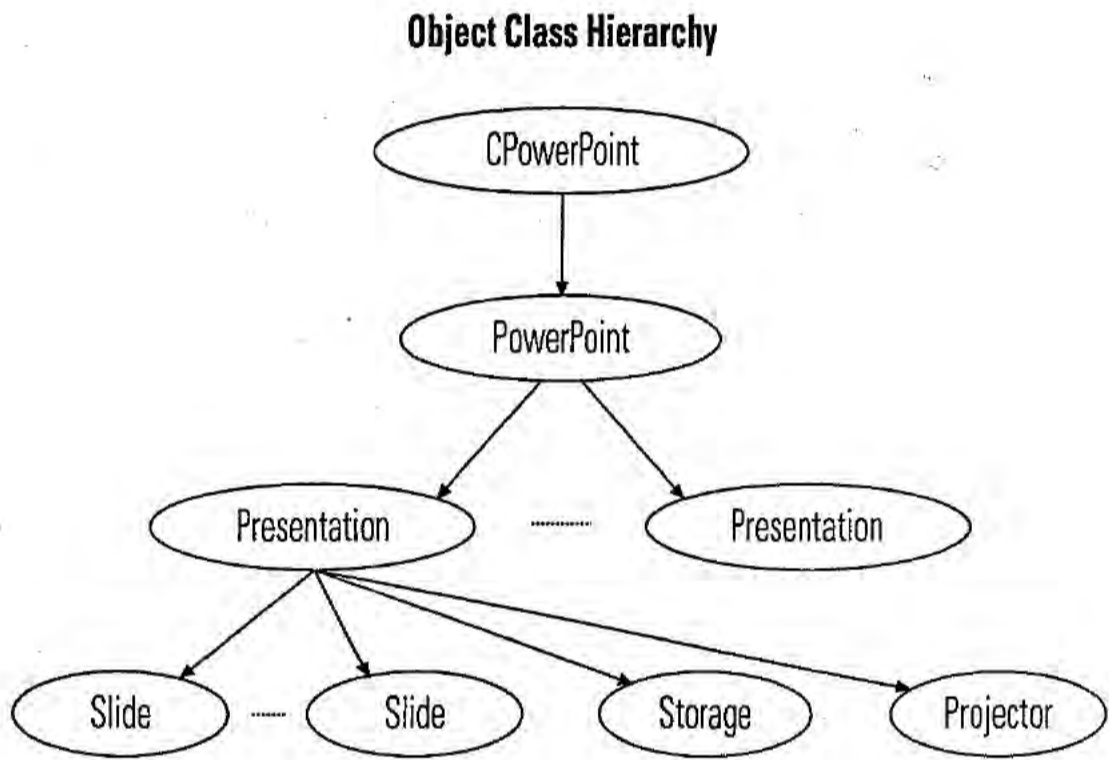
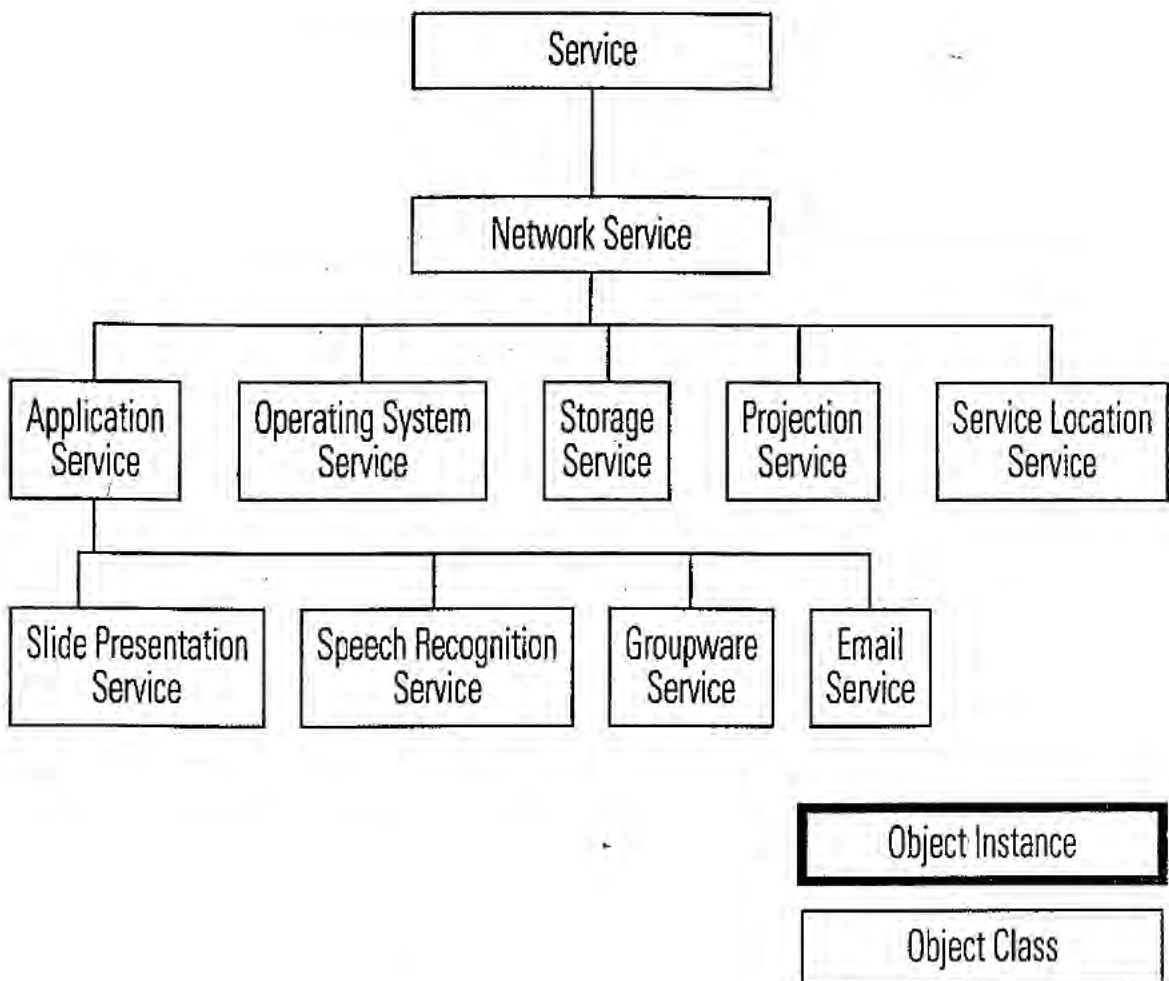


FIG. 5

Object Class Hierarchy for Network Services**FIG. 6**

Object Class Hierarchy for Application Services

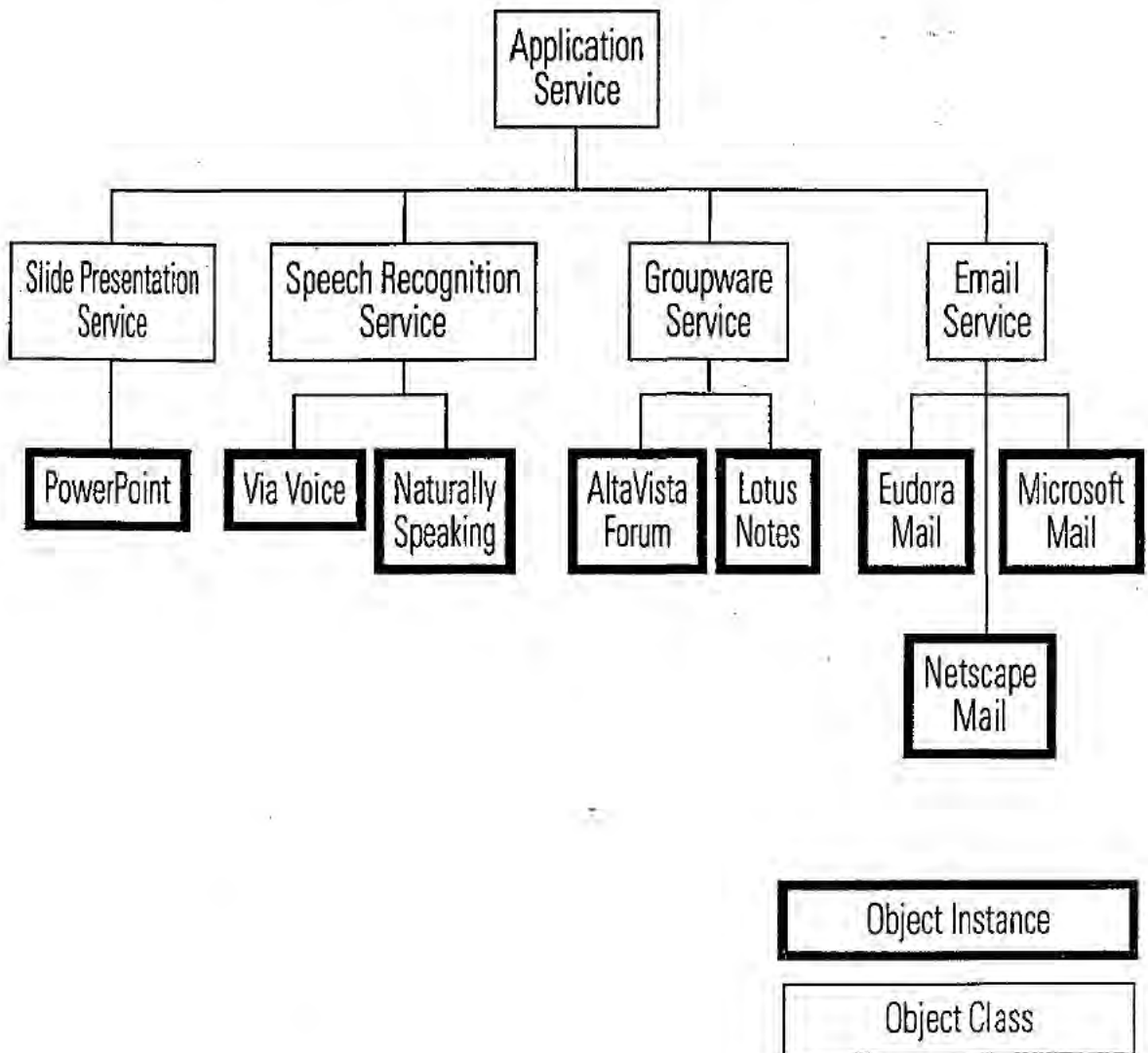


FIG. 7



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FILE LOCATION 9200 SERIAL NUMBER 09237609 PATENT NUMBER 6216158
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Patent # 6216158

APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/237,609	01/25/1999	WENJUN LUO	15886-318

CONFIRMATION NO. 7276

20306
MCDONNELL BOEHNEN HULBERT & BERGHOFF LLP
300 S. WACKER DRIVE
32ND FLOOR
CHICAGO, IL 60606



COMPLETED
Date Mailed: 11/29/2006

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 08/18/2006.

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.

PRESTON WALLACE SR
OIFE (703) 308-9010 EXT 167

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PTO/SB/21 (07-06)

Approved for use through 09/30/2006. OMB 0651-0031
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TRANSMITTAL FORM <small>(to be used for all correspondence after initial filing)</small>	Application Number	09/237,609 (Patent No. 6,216,158 B1)	
	Filing Date	January 25, 1999 (Issued: April 10, 2001)	
	First Named Inventor	Wenjun Luo	
	Art Unit	2154	
	Examiner Name	Viet D. Vu	
Total Number of Pages in This Submission	3	Attorney Docket Number	06-544

COMPLETED

ENCLOSURES <small>(Check all that apply)</small>		
<input type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input type="checkbox"/> Amendment/Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Reply to Missing Parts/Incomplete Application <input type="checkbox"/> Reply to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input checked="" type="checkbox"/> Power of Attorney, Revocation <input type="checkbox"/> Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s) _____ <input type="checkbox"/> Landscape Table on CD	<input type="checkbox"/> After Allowance Communication to TC <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below): Statement Under 37 CFR 3.73(B), return postcard
Remarks		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm Name	McDonnell Boehnen Hubert & Berghoff LLP
Signature	<i>Bradley J. Hubert</i>
Printed name	Bradley J. Hubert
Date	8/16/06
Reg. No.	30,130

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I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:	
Signature	<i>Bradley J. Hubert</i>
Typed or printed name	Bradley J. Hubert
Date	8/16/06

This collection of information is required by 37 CFR 1.5. 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 2 hours 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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STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: 3Com Corporation

Application No./Patent No./Control No.: 6,216,158 Filed/Issue Date: April 10, 2001

Entitled: System and Method Using a Palm Sized Computer to Control Network Devices

3Com Corporation, a Corporation
(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; or
- 2. an assignee of less than the entire right, title and interest.
The extent (by percentage) of its ownership interest is _____ %

In 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 a true copy of the original assignment 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: Elaine P. Lusher To: 3Com Corporation
The document was recorded in the United States Patent and Trademark Office at Reel 9887, Frame 0655, or for which a copy thereof is attached.

2. From: Wenjun Luo To: 3Com Corporation
The document was recorded in the United States Patent and Trademark Office at Reel 9887, Frame 0670, 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.

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.

Bradley J. Hulbert
Signature

8/16/06
Date

Bradley J. Hulbert
Printed or Typed Name

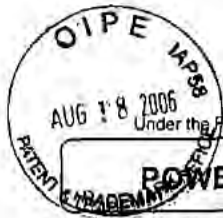
312-913-0001
Telephone Number

Principal Attorney or Agent
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.

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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: 20306

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: 20306

OR

<input type="checkbox"/> Firm or Individual Name			
Address			
City	State	Zip	
Country			
Telephone	Email		

Assignee Name and Address:
 3Com Corporation
 350 Campus Drive
 Marlborough, Massachusetts 01752

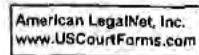
A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner 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 of Assignee of Record
 The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date	8/16/06
Name	Bradley J. Hulbert	Telephone	312-913-0001
Title	Principal Attorney or Agent		

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.





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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

Patent# ~~6011454~~

APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/237,609	01/25/1999	WENJUN LUO	15886-318

22470
HAYNES BEFFEL & WOLFELD LLP
P O BOX 366
HALF MOON BAY, CA 94019

CONFIRMATION NO. 7276



OC000000021393590

COMPLETED

Date Mailed: 11/29/2006

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 08/18/2006.

- 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).

PRESTON WALLACE SR
OIFE (703) 308-9010 EXT 167

OFFICE COPY

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UserID: VVu

Computer: WS10431

Date: 04/06/2000

Time: 16:14

	Type	L #	Hits	Search Text	DBs	Time Stamp	Comments
1	BRS	L1	19642	palm	USPA T	2000/04/0 6 15:28	
2	BRS	L2	939	service\$1 near2 directory	USPA T	2000/04/0 6 15:29	
3	BRS	L3	38273	remote near2 control\$4	USPA T	2000/04/0 6 15:34	
4	BRS	L4	34187 5	communication	USPA T	2000/04/0 6 15:34	
5	BRS	L5	203	1 same 4	USPA T	2000/04/0 6 15:34	
6	BRS	L7	5	2 and 5	USPA T	2000/04/0 6 15:36	
7	BRS	L9	18	3 and 5	USPA T	2000/04/0 6 15:43	
8	BRS	L10	12974	download\$3	USPA T	2000/04/0 6 15:44	
9	BRS	L12	6	1 same 10	USPA T	2000/04/0 6 15:50	
10	BRS	L14	13	1 and 2	USPA T	2000/04/0 6 15:51	
11	BRS	L15	83	2 and 3	USPA T	2000/04/0 6 15:52	
12	BRS	L17	31	15 and 10	USPA T	2000/04/0 6 15:52	

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UserID: VVu

Computer: WS10431

Date: 07/19/2000

Time: 10:31

	Type	L #	Hits	Search Text	DBs	Time Stamp
1	BRS	L1	247826	remote	USPAT	2000/07/19 10:09
2	BRS	L2	141920 8	application	USPAT	2000/07/19 10:09
3	BRS	L3	3653	1 near5 2	USPAT	2000/07/19 10:11
4	BRS	L4	52668	security	USPAT	2000/07/19 10:12
5	BRS	L5	91	3 same 4	USPAT	2000/07/19 10:12
6	BRS	L6	122437 4	control	USPAT	2000/07/19 10:12
7	BRS	L7	635	3 near5 6	USPAT	2000/07/19 10:12
8	BRS	L8	13	4 same 7	USPAT	2000/07/19 10:12