

# EXHIBIT 26



**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of

Ian Hendry et al.

Application No.: 11/198,289

Filed: August 8, 2005

For: SYSTEM FOR REAL-TIME  
ADAPTATION TO CHANGES IN  
DISPLAY CONFIGURATION

) **MAIL STOP: AMENDMENT**

) Group Art Unit: 2116

) Examiner: Thuan N. Du

) Confirmation No.: 8521

**AMENDMENT**

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

Sir:

In response to the Office Action dated April 20, 2007, please amend the  
above-identified patent application as follows:

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**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**LISTING OF CLAIMS:**

1. (Original) A method for reconfiguring a computer system to accommodate changes in a display environment, comprising the steps of:  
detecting the addition or removal of a display device in the computer system;  
providing a notification to a component of an operating system executing on said computer system that a video device has been added or removed, in response to said detection; and  
modifying the allocation of display space to display devices via said operating system component, in response to said notification and in accordance with the addition or removal of a video device.
2. (Original) The method of claim 1 wherein the video device comprises a video card that includes a frame buffer, and said modifying step includes assigning a portion of the display space to the frame buffer of an added video card, or deleting the assignment of a portion of the display space to a removed video card.
3. (Currently Amended) The method of claim 1 wherein said operating system component carries out the further step of storing a preferences file that identifies the status of displayed objects prior to a change in the configuration of a computer.
4. (Original) The method of claim 3 wherein, upon detection of the addition of a video device, said operating system component repositions objects in said display space, in accordance with a status stored in said preferences file.

5. (Currently Amended) The method of claim 3, wherein said ~~preference~~ preferences file stores the video devices which make up the configuration of the computer, and the locations of objects displayed on said video devices.

6. (Original) The method of claim 5, wherein said preferences file also stores operating parameters for said devices.

7. (Original) The method of claim 1 wherein said operating system component carries out the step of assigning a respective frame buffer, which corresponds to an allocated portion of the display space, to a corresponding display device.

8. (Currently Amended) The method of claim 1 wherein, upon detection of the addition of a video device, said operating system component causes a software program associated with the added device to be launched.

9. (Original) The method of claim 1 wherein said operating system component further carries out the step of reconfiguring a computer resource to correspond to the status of objects located in the display space.

10. (Original) The method of claim 9 wherein said computer resource is a color look-up table.

11. (Currently Amended) The method of claim 1, further including the step of recognizing an error condition resulting from an attempt to address a frame buffer that has been removed, providing a notification to said operating system component in response to said error condition, and deleting an allocation of display space to the removed frame buffer.

12. (Original) A system which provides hot-plugging capabilities for display devices, comprising:

a video device including a frame buffer for storing data that defines an image to be displayed on an associated display device;

a first operating system component which defines a display space and assigns a portion of said display space to said frame buffer, and which provides data for images to be displayed to said frame buffer; and

a second operating system component which detects the addition or removal of a display device in a computer system, and provides a notification of such addition or removal to the first operating system component in response to said detection, to cause the assignment of a portion of the display space to be modified in accordance with a detected addition or removal.

13. (Original) The system of claim 12, wherein said first operating system component launches a software program associated with the display device in response to notification that the display device has been added.

14. (Currently Amended) The system of ~~claim 9~~ claim 12, further including a ~~preference~~ preferences file stored in memory which indicates the status of objects being displayed when a display device is removed.

15. (Currently Amended) A computer-readable medium ~~containing~~ having a device manager program and a display manager program stored thereon, wherein said device manager program ~~performs~~ causes a computer system to perform the steps of:

detecting the addition or removal of a display device in a ~~the~~ computer system, and

providing a notification to ~~the~~ said display manager program when a display device is added or removed; and

~~and wherein said display manager performs~~ program causes the computer system to perform the step of:

modifying the allocation of display space to display devices in response to said notification from ~~the~~ said device manager program.

16. (Currently Amended) The computer-readable medium of claim 15, wherein said display manager program causes the computer system to perform the ~~further performs the~~ steps of storing a ~~preference~~ preferences file relating to the status of objects appearing on a display device, and restoring objects to the status stored in the preferences file when a display device is added.

17. (Currently Amended) The computer-readable medium of claim 15, wherein said display manager program causes the computer system to perform ~~performs the~~ further step of assigning a respective frame buffer to a display device in response to said notification of an added display device, or deleting the assignment of a respective frame buffer from said display device in response to said notification of a removed display device.

18. (Currently Amended) The computer-readable medium of claim 15, wherein said display manager program causes the computer system to perform ~~performs the~~ further step of launching a software program in response to said notification.

19. (Currently Amended) The computer-readable medium of claim 15, wherein said display manager program causes the computer system to perform ~~performs the~~ further step of reconfiguring at least one computer resource in accordance with the modification of the display space allocation.

20. (Original) The computer-readable medium of claim 19, wherein said computer resource is a color look-up table.

21. (New) The method of claim 1, wherein said operating system component carries out the further steps of:

registering an added video device as a new video device in response to said notification of an added video device;

determining a location in a memory of a video driver associated with the added video device; and

storing the location of the video driver associated with the added video device in the memory.

22. (New) The method of claim 21, wherein said operating system component carries out the further step of activating the video driver associated with the added video device when the video driver is present in the memory and inactive.

23. (New) The method of claim 22, wherein said operating system component carries out the further steps of:

storing a preferences file that identifies the status of displayed objects prior to a change in the configuration of the computer system;

accessing the preferences file to determine whether the added video device was previously connected to a frame buffer associated with the computer system; and

restoring a display environment to the status identified in the preferences file upon determining that the added video device was previously connected to the frame buffer associated with the computer system.

24. (New) The method of claim of claim 1, wherein said operating system component carries out the further step of notifying at least one software program executed by the operating system of a change in the configuration of the computer system in response to said notification that a video device has been added or removed.

25. (New) The method of claim 3 wherein, in response to said notification of a removed video device, said operating system component carries out the further step of searching the preferences file to retrieve a status of displayed objects corresponding to when the video device was previously removed.

26. (New) The method of claim 1 wherein, in response to said notification of a removed video device, said operating system component carries out the further

step of shutting down at least one application program associated with the removed video device that was executing on the operating system.

27. (New) The method of claim 1 wherein, in response to said notification that a video device is removed, said operating system component carries out the further step of deleting an assignment of display space to a frame buffer associated with the removed video device.

28. (New) The system of claim 12, wherein said first operating system component is further configured for:

registering an added display device as a new display device in response to the notification of an added display device from said second operating system component;

determining a location in a memory of a display driver associated with the added display device; and

storing the location of the display driver associated with the added display device in the memory.

29. (New) The system of claim 28, wherein said first operating system component is further configured for activating the display driver associated with the added display device when the display driver is present in the memory and inactive.

30. (New) The system of claim 12, wherein said first operating system component is further configured for:

storing a preferences file that identifies the status of displayed objects prior to a change in the configuration of the computer system;

accessing the preferences file to determine whether an added display device was previously connected to said frame buffer; and

restoring a display environment to the status identified in the preferences file upon determining that the added display device was previously connected to said frame buffer.



31. (New) The system of claim 14 wherein, in response to said detection of a removal of a display device, said first operating system component is further configured for searching the preferences file to retrieve a status of displayed objects corresponding to when the display device was previously removed.

32. (New) The system of claim 12 wherein, in response to said detection of a removal of a display device, said first operating system component is further configured for shutting down at least one application program associated with the removed display device.

33. (New) The system of claim 12 wherein, in response to said detection of a removal of a display device, said first operating system component is further configured for deleting an assignment of display space to a frame buffer associated with the removed display device.

34. (New) The system of claim 12, wherein said first operating system component is further configured for reconfiguring at least one computer resource used by an added or removed display device to correspond to a status of objects located in the display space after the change in the configuration of the computer system, in response to said notification of an added or removed display device.

35. (New) The system of claim 12, further comprising a detection unit operable to detect when an input/output device is added to or removed from the computer system, and provide an indication to said second operating system component of a detected addition or removal of an input/output device in the computer system,

wherein said second operating system component is further configured for receiving the indication of the addition or removal of the input/output device, and determining whether the added or removed input/output device is a display device.

36. (New) The system of claim 35, wherein said detection unit is a video card operable to detect that an input/output device is connected thereto or disconnected therefrom.

37. (New) The system of claim 35, wherein said second operating system component is further configured for:

communicating with an added input/output device to detect at least one of a type and identity of the added input/output device;

determining whether the added input/output device is a display device according to the detected at least one of the type and identity of the added input/output device;

storing the detected at least one of the type and identify of the added input/output device in a memory; and

accessing the memory each time an input/output device is added to determine whether the added input/output device is a display device.

38. (New) The system of claim 37, wherein said second operating system component is further configured for determining whether an input/output device removed from the computer system is a display device by referencing the at least one of the type and identify of the input/output device stored in the memory.

39. (New) The computer-readable medium of claim 15, wherein said display manager program causes the computer system to perform the further steps of:

registering an added display device as a new display device in response to the notification of an added display device from said device manager program;

determining a location in a memory of a display driver associated with the added display device; and

storing the location of the display driver associated with the added display device in the memory.

40. (New) The computer-readable medium of claim 39, wherein said display manager program causes the computer system to perform the further step of activating the display driver associated with the added display device when the display driver is present in the memory and inactive.

41. (New) The computer-readable medium of claim 16 wherein, in response to said notification of a removal of a display device, said display manager program causes the computer system to perform the further step of searching the preferences file to retrieve a status of displayed objects corresponding to when the display device was previously removed.

42. (New) The computer-readable medium of claim 15 wherein, in response to said detection of a removal of a display device, said display manager program causes the computer system to perform the further step of deleting an assignment of display space to a frame buffer associated with the removed display device.

43. (New) The computer-readable medium of claim 15, further having a detection program stored thereon,

wherein said detection program causes the computer system to perform the step of detecting when an input/output device is added to or removed from the computer system, and

wherein said device manager program causes the computer system to perform the further step of determining whether an input/output device that was detected to be added or removed is a display device by detecting at least one of a type and identity of the added or removed input/output device.

## **REMARKS**

This communication is a full and timely response to the aforementioned non-final Office Action dated April 20, 2007. By this communication, claims 3, 5, 8, 11 and 15-19 are amended, and claims 21-43 are added. Thus, claims 1-43 are pending in the application. Reexamination and reconsideration of the application are respectfully requested in view of the foregoing amendments and the following remarks.

### **I. Obviousness-Type Double Patenting Rejections**

In item 3 on page 2 of the Office Action, claims 1-4 and 7-20 were rejected on the grounds of non-statutory obviousness-type double patenting as being unpatentable over claims 1-12 and 16-21 of U.S. Patent No. 6,282,646, which is the grandparent application of the present application. Further, in item 4 on page 2 of the Office Action, claims 1, 12 and 15 were rejected on the grounds of non-statutory obviousness-type double patenting as being unpatentable over claims 1, 22 and 43 of U.S. Patent No. 6,928,543, which is the parent application of the present application.

Without intending to acquiesce to these rejections, once all other issues relating to patentability have been resolved, Applicants will submit a Terminal Disclaimer under 37 CFR 1.321, which is signed by a registered attorney of record, together with the fee required under 37 CFR 1.20(d), to overcome the obviousness-type double patenting rejections of claims 1-4 and 7-20, if the basis for the rejection still exists.

### **II. Claim Objection**

In item 5 on page 3 of the Office Action, claim 14 was objected to for depending from claim 9. As kindly suggested by the Examiner, claim 14 has been amended to depend from claim 12 instead of claim 9. Accordingly, having amended claim 14 to depend from claim 12, Applicants respectfully request that the objection to claim 14 be withdrawn.

### **III. Rejections Under 35 U.S.C. §102**

In item 7 on page 3 of the Office Action, claims 1-6, 12, and 14-17 were rejected under 35 U.S.C. §102(e) as being anticipated by Hogle, IV (U.S. Patent No. 5,923,307, hereinafter "Hogle"). Applicants respectfully traverse this rejection, and submit that the present invention is patentable for the following reasons.

Changes in the configuration of conventional computer systems, such as the addition or removal of video devices and display devices, only became effective upon a restart, or reboot, of the computer system, or while the computer system is placed in a "sleep" mode in which the computer system's central processing unit is maintained in a minimal operating state. The operating system of a conventional computer system detects the presence of each device driver loaded on the system as part of its initial startup procedure or upon being awakened from the "sleep" mode, and registers each detected device driver to permit communication between the operating system and the device with which the driver is associated. However, if a device, such as a video device or display device, and corresponding driver are added to or removed from the system either after the operating system completes its initialization procedure or after the computer system is awakened from the "sleep" mode, the driver of the device will not be registered with the operating system. As a result, communications between the operating system and the device driver may not take place until the operating system goes through its initialization procedure again or is placed back in the "sleep" mode.

In view of these problems with conventional computer systems, the present invention provides a method, system and computer program which reconfigure a computer system to accommodate changes in a display environment. In particular, the present invention provides "hot plugging" capabilities for video and display devices, in which a computer system is automatically reconfigured to accommodate changes in a display environment as soon as a device pertaining to the display environment of the computer system is added or removed.

The method of claim 1 comprises the steps of detecting the addition or removal of a display device, and providing a notification to a component of an operating system executing on the computer system that a video device has been

added or removed, in response to the detection of the addition or removal of a display device in the computer system.

The system of claim 12 comprises a second operating system component for detecting the addition or removal of a display device in a computer system, and providing a notification of such addition or removal to the first operating system component in response to the detection, to cause the assignment of a portion of a display space to be modified in accordance with a detected addition or removal.

Claim 15 recites a computer-readable medium having a device manager program and a display manager program stored thereon, where the device manager program causes the computer system to perform the steps of detecting the addition or removal of a display device in the computer system, and providing a notification to the display manager program when a display device is added or removed.

Applicants respectfully submit that Hogle does not disclose or suggest the subject matter of claims 1, 12 and 15 for the following reasons.

Hogle discloses a system for positioning monitor spaces of a plurality of monitors in logical space so that the plurality of monitor spaces are arranged relative to each other in a contiguous and non-overlapping region of a virtual desktop. In particular, Hogle discloses that when a plurality of monitors 330, 332 are connected to a computer 300 to form a multiple monitor display architecture, a USER program code 33 automatically arranges the monitor spaces 41, 43 relative to each other in logical space to form a contiguous, non-overlapping region as shown in Figure 7(b). As a result, the user of the computer is presented with a contiguous virtual desktop 50 which is devoid of overlaps and gaps between the monitor spaces, and which behaves as if the virtual desktop 50 was within a single monitor space (see Column 10, line 66 to Column 11, line 6).

The USER program code 33 is a subsystem of the operating system 303 of the computer 300, and controls the manner in which the virtual desktop 50 and various graphic objects (e.g., windows, menus, dialog boxes and the cursor) are displayed to the end-user of the computer 300 (see Column 7, lines 64-66, and Column 9, lines 59-62). Further, the USER program code 33 manages the configuration of multiple monitors in logical space such that the end-user is presented with a continuous display space that spans two or more monitors, where

such continuous display space behaves and responds to the end-user essentially in the same manner as if a single monitor was being used (see Column 10, lines 8-23).

To perform this management, the USER program code 33 operates as a reconfiguration code, which is specifically designed for a multiple monitor environment. The reconfiguration code (1) arranges the component monitor spaces so that they form a contiguous, non-overlapping display space at boot-time and whenever the display space undergoes a geometry change during run-time, and (2) manages (e.g., relocates or resizes) windows or display regions such that they are displayed and behave in a logical manner after a display space geometry change (see Column 10, lines 23-35). Hogle discloses that a geometry change is a change in the size, shape or orientation of the aggregate display space (see Column 11, lines 19-25).

In relevant part, Hogle discloses that a geometry change occurs whenever one of the following situations occurs:

(1) the end-user of the computer 300 turns on or otherwise activates an additional monitor beyond the monitor(s) already present in the display configuration and thereby causes either the newly added monitor to overlap an existing monitor, or a gap to occur between the newly added monitor and an existing monitor (see Column 11, lines 26-39, and Figures 8(a) and 8(b));

(2) One of the monitors is deactivated by equipment failure or the intentional actions of the end-user, which causes the window previously displayed in the deactivated monitor to become "orphaned" (i.e., no longer appearing in an available monitor space), and thus is rendered invisible to the end-user (see Column 18, lines 1-18, and Figures 17(a)-17(c)).

In contrast to the claimed subject matter, Hogle does not disclose the steps of detecting the addition or removal of a display device, and providing a notification of the addition or removal to a component of the operating system in response to said detection, as recited in claim 1. More particularly, it does not disclose an operating system component for detecting such addition or removal of a display device and providing notification to another operating system component in response to such detection, as recited in claim 12. Nor does it disclose a device manager program that causes a computer to detect such addition or removal and provide notification to

a display manager program when a display device is added or removed, as recited in claim 15.

Rather, at column 18, lines 14-19 (cited in the Office Action), Hogle states that “after the end-user has informed USER of the geometry change, the reconfiguration code will move the orphaned window...” Thus, Hogle expressly discloses that the end-user must manually inform the USER program code of an addition or removal of a display device in the configuration of a multiple monitor display for the USER program code to become aware of the change in configuration. There is no detection of the change, per se, by the system, and sending of a notification in response to such detection. The USER code doesn't take action until the end-user instructs it to do so.

In summary, claims 1, 12 and 15 recite a method, system and program in which the reconfiguration of the display environment occurs automatically upon the addition or removal of a display device, i.e. a true “hot-plugging” capability, whereas Hogle discloses an arrangement that requires user input after a physical change has occurred before the reconfiguration is effected.

Accordingly, Applicants respectfully submit that claims 1, 12 and 15 are not anticipated by Hogle, since Hogle fails to disclose each and every feature of claims 1, 12 and 15.

Furthermore, in view of the distinctions discussed above, Applicants respectfully submit that it would not have been obvious to modify Hogle in such a manner as to result in, or otherwise render obvious, the subject matter of claims 1, 12 and 15, particularly because Hogle expressly requires the end-user to notify the USER program code of an addition or removal of a video device or display device.

Therefore, for at least the foregoing reasons, Applicants respectfully submit that claims 1, 12 and 15, as well as claims 2-11, 13-14 and 16-43 which depend therefrom, are patentable over the applied prior art.



**IV. Rejections Under 35 U.S.C. § 103**

In item 14 on page 5 of the Office Action, dependent claims 7-11, 13 and 18-20 were rejected under 35 U.S.C. §103(a) as being unpatentable over Hogle.

As demonstrated above, Hogle fails to disclose or suggest each and every feature of independent claims 1, 12 and 15.

Therefore, Hogle cannot disclose or suggest the subject matter of dependent claims 7-11, 13 and 18-20 by virtue of at least their dependency from claims 1, 12 and 15.

**V. Conclusion**

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is in condition for allowance. Accordingly, Applicants request a favorable examination and consideration of the instant application.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, the Examiner is respectfully requested to contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

Date: July 20, 2007

By:



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