

# **EXHIBIT 29**

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3/23/00

Patent  
Attorney's Docket No. P2232-460

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

Ian HENDRY et al.

Application No.: 09/074,300

Filed: May 8, 1998

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



Group Art Unit: 2787

Examiner: R. Hartman Jr.

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MAR 30 2000  
TC 2700 MAIL ROOM

AMENDMENT

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

In response to the Office Action dated October 28, 1999, kindly amend the above-identified application as follows:

IN THE CLAIMS:

1. (Amended) A method for reconfiguring a computer system to accommodate changes in a display environment, comprising the steps of:

A1

detecting the addition or removal of an input/output device in the computer system;

determining whether an input/output device which has been added or removed is a video device, in response to said detection;

providing a notification to a display manager when a determination is made that a video device has been added or removed; and

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01 FC:102  
02 FC:103

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A1  
modifying the allocation of display space to display devices via said display manager, in accordance with the addition or removal of a video device.

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

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

a display manager 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 device manager which detects the addition or removal of [the video] a device [to] in a computer system, determines whether a device which has been added or removed is a video device, and provides a notification of such addition or removal to the display manager when a video device is determined to have been added or removed, to cause the assignment of a portion of the display space to be modified in accordance with a detected addition or removal.

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A3  
13. (Amended) A system which provides hot-plugging capabilities for display devices, comprising:

at least one display for displaying images;

a display manager which defines a display space and assigns a portion of said display space to a display device, and which provides data for images to be displayed on said display device; and

A3

a device manager which detects the addition or removal of a [display] device in a computer system, determines whether a device which has been added or removed is a display device, and provides a notification of such addition or removal to the display manager when a display device is determined to have been added or removed, to cause the assignment of a portion of the display space to be modified in accordance with a detected addition or removal.

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Please add the following claims 22-37:

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--22. The method of claim 3, wherein said preference file stores the video devices which make up the configuration of the computer, and the locations of objects displayed on said video devices.

A4

23. The method of claim 22, wherein said preferences file also stores operating parameters for said devices.

24. A method for reconfiguring a computer system to accommodate changes in a display environment, comprising the steps of:  
storing a preferences file that identifies the status of displayed objects prior to a change in the configuration of a computer;

detecting the addition of a video device in the computer system;  
providing a notification to a display manager that a video device has been added;  
modifying the allocation of display space to display devices via said display manager, in accordance with the addition of a video device; and  
repositioning objects in said display space, in accordance with a status stored in said preferences file.

A4

25. The method of claim 24, wherein said preference file stores the video devices which make up the configuration of the computer, and the locations of objects displayed on said video devices.

26. The method of claim 25, wherein said preferences file also stores operating parameters for said devices.

27. A method for reconfiguring a computer system to accommodate changes in a display environment, comprising the steps of:

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detecting the addition or removal of a video device in the computer system;  
providing a notification to a display manager that a video device has been added or removed;  
modifying the allocation of display space to display devices via said display manager, in accordance with the addition or removal of a video device; and

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reconfiguring a computer resource to correspond to the status of objects located in the display space.

28. The method of claim 27 wherein said computer resource is a color look-up table.

<sup>25</sup>  
~~28~~. A system which provides hot-plugging capabilities for display devices, comprising:

A4  
a video device including a frame buffer for storing data that defines an image to be displayed on an associated display device;

a display manager 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;

a device manager which detects the addition or removal of the video device to a computer system, and provides a notification of such addition or removal to the display manager to cause the assignment of a portion of the display space to be modified in accordance with a detected addition or removal; and

means responsive to the removal of a video device for storing a preference file in memory which indicates the status of objects being displayed.

<sup>25</sup>  
~~26~~<sub>30</sub>. The system of claim <sup>25</sup>~~29~~, wherein said display manager is responsive to the addition or removal of a video device to restore displayed objects to a status stored in said

preference file which corresponds to the configuration of the computer system after the video device is added or removed.

<sup>27</sup><sub>31.</sub> The system of claim <sup>25</sup>~~29~~, wherein said preference file stores the video devices which make up the configuration of the computer, and the locations of objects displayed on said video devices.

<sup>28</sup><sub>32.</sub> The system of claim <sup>27</sup>~~31~~, wherein said preferences file also stores operating parameters for said devices.

<sup>29</sup><sub>33.</sub> A computer-readable medium containing a device manager program and a display manager program, wherein said device manager program performs the steps of:

- detecting the addition or removal of a video device in a computer system,
- and
- providing a notification to the display manager program when a video device is added or removed;
- and wherein said display manager performs the steps of:
- modifying the allocation of display space to display devices in response to said notification from the device manager, and
- storing a preference 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 video device is added.

<sup>30</sup>/<sub>34</sub>. The computer-readable medium of claim <sup>29</sup>/<sub>33</sub>, wherein said preference file stores the video devices which make up the configuration of the computer, and the locations of objects displayed on said video devices.

<sup>31</sup>/<sub>35</sub>. The computer-readable medium of claim <sup>30</sup>/<sub>34</sub>, wherein said preferences file also stores operating parameters for said devices.

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<sup>32</sup>/<sub>36</sub>. A computer-readable medium containing a device manager program and a display manager program, wherein said device manager program performs the steps of:  
detecting the addition or removal of a video device in a computer system,  
and  
providing a notification to the display manager program when a video device is added or removed;  
and wherein said display manager performs the step of:  
modifying the allocation of display space to display devices in response to said notification from the device manager, and  
reconfiguring at least one computer resource in accordance with the modification of the display space allocation.

<sup>33</sup>/<sub>37</sub>. The computer-readable medium of claim <sup>32</sup>/<sub>36</sub>, wherein said computer resource is a color look-up table.

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REMARKS

In response to the Office Action dated October 28, 1999, Applicants respectfully request reconsideration and withdrawal of the rejections of the claims.

Claim 1 was rejected under 35 U.S.C. § 102 as being unpatentable over the Hendry et al. patent (U.S. Patent No. 5,682,529), and claims 2-21 were rejected as being unpatentable over the Hendry et al. patent in view of the Kimura patent (U.S. Patent No. 5,469,223). It is respectfully submitted, however, that the Hendry patent neither anticipates, nor otherwise suggests, the subject matter of the present invention, whether considered by itself or in combination with the Kimura patent.

As discussed in the Background portion of the present application, the Hendry et al. patent discloses a system for dynamically accommodating changes in the display configuration of a computer, without the need to restart the computer. For example, if the computer is in a sleep mode, and changes are made to the display configuration of the computer, these changes are immediately recognized upon the resumption of normal operation, when the computer is awakened from its sleep mode, without the need to restart the computer. The present invention builds upon this system, by adding hot-plugging capabilities. For example, the user might add a video card which is embodied within a PC Card, while the computer is running. In accordance with the invention, a device manager detects the insertion of the PC Card, and determines whether the PC Card is a video device. If it is, notification is provided to a display manager, which then reconfigures the display configuration to accommodate the newly added video card. In a similar manner, when a device is removed from the computer system, the device manager determines whether the

removed device performs a video operation, and if so notifies the display manager so that the display configuration can be appropriately updated.

In accordance with one aspect thereof, the present invention adds to the system of the Hendry et al. patent by utilizing a device manager to provide hot-plugging capabilities. More particularly, the device manager detects the addition or removal of any type of input/output device in the computer system. Upon detecting the addition or removal of a device, the device manager then determines whether that input/output device is a video device. As illustrated in Figure 5, if the device which has been added or removed is not a video device, the device manager continues on with its normal operations associated with the addition or removal of a device. If, however, the added or removed device is a video device, the device manager informs the display manager of the addition or removal. In response to this notification, the display manager then modifies the allocation of display space accordingly.

It is respectfully submitted that the distinctions between the present invention and the Hendry et al. patent are brought out in each of the rejected claims. For example, claim 1 recites the steps of detecting the addition or removal of an input/output device, and "determining whether an input/output device which has been added or removed is a video device, in response to said detection." It is respectfully submitted that the Hendry et al. patent does not disclose this step of determining whether an input/output device that is added or removed in a computer system is a video device. Further, it is noted that the rejection of claim 1 does not address this particular element of the claim. For at least this

reason, therefore, it is respectfully submitted that the subject matter of claim 1 is not anticipated by the Hendry et al. patent.

Claim 10 recites a system which provides hot-plugging capabilities for display devices, comprising a video device, a display manager, and a device manager. The device manager detects the addition or removal of a device in a computer system, and provides a notification of such addition or removal to the display manager. Claim 13 also recites a system which provides hot-plugging capabilities, that includes a display, a display manager and a device manager. In a similar fashion, claim 16 recites a computer-readable medium containing a device manager program and a display manager program.

It is respectfully submitted that the Hendry et al. patent does not disclose a device manager as recited in each of these claims. Furthermore, it is noted that the rejection of each of these claims does not address this claimed subject matter. If the rejection of any of the claims is repeated, the Examiner is respectfully requested to explain the manner in which the Hendry et al. patent is being interpreted relative to the claimed device manager.

In addition to the foregoing distinctions, other features of the invention are likewise not disclosed in the prior art. For instance, claims 3, 12, 15 and 17 recite the concept of storing a preference file that identifies the status of displayed objects prior to a change in the configuration of a computer. This feature is also recited in newly added claims 24-26 and 29-34. With respect to this claimed subject matter, the Office Action states that the Hendry et al. patent does not specifically disclose storing a preference file, but goes on to conclude that it is suggested within the disclosure of the patent, by the presence of a frame buffer. However, as acknowledged in the Office Action, a frame buffer stores the *contents*

of a screen image, i.e. the data which is displayed, per se. In contrast, a preference file stores information about the *status* of displayed objects. For instance, in a configuration which contains multiple display monitors, the preference file indicates where the system's main menu is to be displayed upon the multiple monitors. Whenever the computer system is restored to that configuration, the main menu is moved to the appropriate monitor, as indicated by the preference file. As described on page 12 of the application, the preference file can store additional information about the configuration, such as operating parameters for the monitor, and the like. A frame buffer merely stores the contents of the image displayed on one of the monitors. It is respectfully submitted that the frame buffer does not suggest a preference file of the type provided by the present invention, which stores information relating to the *configuration* of the display system.

Another feature of the present invention is the reconfiguration of computer resources, such as a color lookup table, to correspond to the status of objects located in the display space. This feature is recited in claims 7, 8, 20 and 21, as well as newly added claims 27, 28, 35 and 36. In connection with this subject matter, the Office Action notes that the Hendry et al. patent discloses the use of a lookup table, and concludes that it would be obvious to employ a color lookup table therein. It is respectfully submitted, however, that the lookup table described in the Hendry et al. patent is quite distinct from the subject matter of the claims identified above. The noted portion of the Hendry et al. patent (column 4, lines 10-14) pertains to the situation in which some monitors are able to directly communicate information about their operating states to display drivers, whereas other (typically older) monitors do not have such functionality. For this latter case, the Hendry

et al. patent discloses that the display driver can obtain information about a particular monitor's capabilities by means of a lookup table that is stored within the computer system. In other words, this lookup table stores information about the operating parameters of a plurality of different types of monitors. The display drivers can refer to this stored information to determine the operating parameters for a given monitor that is connected to the system.


It is respectfully submitted that this disclosure does not anticipate, nor otherwise suggest, the subject matter of claims 7, 8 and the like. Claim 7 recites that the display manager carries out the step of *reconfiguring* a computer resource to correspond to the status of objects located in the display space. In the particular example given at the top of page 13 of the application, one such resource is a color lookup table. In accordance with the invention, if a second monitor is added to the display system, and certain windows or other objects are moved to that monitor's display space, then the color lookup table for that monitor is reconfigured in accordance with the application programs that own the moved objects. It is respectfully submitted that the disclosure of the Hendry et al. patent relating to the use of a lookup table for display monitor capabilities, is not the same as, nor otherwise suggestive of, this claimed subject matter.

Application No. 09/074,300  
Attorney's Docket No. P2232-460

For the foregoing reasons, it is respectfully submitted that all pending claims are patentable over the prior art of record. Reconsideration and withdrawal of the rejections are therefore respectfully submitted.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

By:   
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Alexandria, Virginia 22313-1404  
(703) 836-6620

Date: March 28, 2000

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

In re Patent Application of  
Ian HENDRY et al  
Application No.: 09/074,300  
Filed: May 8, 1998  
For: SYSTEM FOR REAL-TIME  
ADAPTATION TO CHANGES IN  
DISPLAY CONFIGURATION



Group Art Unit: 2787  
Examiner: R. Hartman, Jr.

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**AMENDMENT/REPLY TRANSMITTAL LETTER**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

Enclosed is a reply for the above-identified patent application.

- A Petition for Extension of Time is also enclosed.
- A Terminal Disclaimer and a check for  \$55.00 (248)  \$110.00 (148) to cover the requisite Government fee are also enclosed.
- Also enclosed is \_\_\_\_\_
- \_\_\_\_\_ statement(s) claiming small entity status  
 are also enclosed  were submitted previously.
- A Request for Entry and Consideration of Submission under 37 C.F.R. § 1.129(a) (146/246) is also enclosed.
- No additional claim fee is required.
- An additional claim fee is required, and is calculated as shown below:

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AMENDED CLAIMS					
	NO. OF CLAIMS	HIGHEST NO. OF CLAIMS PREVIOUSLY PAID FOR	EXTRA CLAIMS	RATE	ADD'T'L FEE
Total Claims	37	MINUS 21 =	16	× \$18.00 (103) =	\$288.00
Independent Claims	9	MINUS 4 =	5	× \$78.00 (102) =	\$390.00
If Amendment adds multiple dependent claims, add \$260.00 (104)					
Total Amendment Fee					\$678.00
If small entity status is claimed, subtract 50% of Total Amendment Fee					
<b>TOTAL ADDITIONAL FEE DUE FOR THIS AMENDMENT</b>					<b>\$678.00</b>


A claim fee in the amount of \$ 678.00 is enclosed.

Charge \$ \_\_\_\_\_ to Deposit Account No. 02-4800.

The Commissioner is hereby authorized to charge any appropriate fees under 37 C.F.R. §§ 1.16, 1.17, 1.20(d) and 1.21 that may be required by this paper, and to credit any overpayment, to Deposit Account No.02-4800. This paper is submitted in duplicate.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

By:   
 James A. LaBarre  
 Registration No. 28,632

P.O. Box 1404  
 Alexandria, Virginia 22313-1404  
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Patent  
Attorney's Docket No. P2232-460

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

In re Patent Application of	)	
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Ian HENDRY et al	)	Group Art Unit: 2787
	)	
Application No.: 09/074,300	)	Examiner: R. Hartman, Jr.
	)	
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- An additional claim fee is required, and is calculated as shown below:

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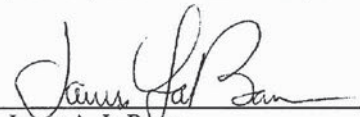
AMENDED CLAIMS					
	NO. OF CLAIMS	HIGHEST NO. OF CLAIMS PREVIOUSLY PAID FOR	EXTRA CLAIMS	RATE	ADDT'L FEE
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Respectfully submitted,  
 BURNS, DOANE, SWECKER & MATHIS, L.L.P.

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