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PATENT
Atty. Dkt. 0867/50841

MAIL ROOM
AUG 5 1991
PAT. & TRADEMARK OFF.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Eric R. Hamilton
Title:	COMPUTER ASSISTED INSTRUCTIONAL DELIVERY SYSTEM
Serial No.:	07/510,141
Filed:	April 17, 1990
Examiner:	P. Kubel
Art Unit:	332

CERTIFICATE OF MAILING

I hereby certify that this paper is being deposited with the United States Postal Service with sufficient postage as Express Mail in an envelope addressed to: **Honorable Commissioner of Patents and Trademarks, Washington, D.C. 20231**, on this date.

Robert Smith
(Signature of person making deposit)

8/5/91
(Date)

RB729742244US
Express Mail Label Number

AMENDMENT A

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

Dear Sir:

AUG - 9 91
GROUP 330

This communication is responsive to the Office Action dated February 5, 1991, concerning the above-referenced application.

Applicant has enclosed with this amendment a Petition for a three-month Extension of Time to Respond to the February 5, 1991 Office Action.

Please amend the above-identified application as follows:

In the Specification:

Page 2, line 1, delete the comma after "classroom";

Page 3, line 5, insert a comma after "Inc.";

Page 5, line 4, insert a comma after "capability";

Page 6, line 21, change "specific" to --the specific--;

Page 6, line 33, change "main()" to --main--;

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060 MC 08/08/91 07510141 1 203 90.00 CK

Page 6, line 34, delete "invention";

Page 7, line 29, insert a comma after "Appendix";

Page 8, line 8, before "102 illustrates" insert --In the Figure,--;

Page 9, line 27, change "The" to --Alternatively, the--;

Page 11, line 11, after "is connected" insert --via a data bus--;

Page 11, line 14, change "("ROM")" to --("ROM"))--;

Page 11, line 14, after "interface" insert --(217)--;

Page 11, line 15, delete "(217)";

Page 11, line 15, after "chips", insert --(210)--;

Page 11, line 18, change "unit" to --unit)--;

Page 11, line 23, change "208" to --208)--;

Page 11, line 23, change "215" to --(215--;

Page 11, line 23, delete "260,";

Page 11, line 26, after "comprised of" insert --blocks--;

Page 12, line 4, after "unit" insert --(253)--;

Page 12, line 5, delete "(253)";

Page 12, line 19, after "transmission" insert --via a data bus--;

Page 12, line 21, after "Such a" insert --handwriting--;

Page 13, line 4, change "272" to --(272)--;

Page 15, line 5, after "The" insert --lower right--;

Page 15, line 5, change "333" to --(333)--;

Page 19, line 18, change "1024x1024" to --1024 x 1024--;

Page 19, line 20, change "640x480" to --640 x 480--;

Page 22, lines 8, change "checknet" to --Checknet--;

Page 22, lines 22, change "checknet" to --Checknet--;

Page 23, line 10, change "(532A" to --(Step 532A--;

Page 32, line 19, change "main()" to --main--;

Page 42, line 12, after "information" insert --simultaneously--;

In the Drawings:

Please amend Figures 1 and 2 in accordance with the proposed corrections made in red ink on the attached photocopies of the informal drawings.

In the Claims:

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Sub B2 Claim 1. (Once Amended) A computer assisted instructional information delivery system comprising:

at least two stations;

at least two [interactive monitors, each positioned in] monitor means, one associated with each of said two stations, [wherein said monitor displays] for displaying instructional information in visual form;

[stylus] at least two input means, one associated with each of said two stations, for entering handwritten instructional information in freehand form on [each one of said monitors] at least its associated monitor means; and

communication means for virtually simultaneously transmitting instructional information being entered [from said stylus] at either of said two input means from either station to the other station, [as inputted on one of said monitors] and for virtually simultaneously displaying said transmitted instructional information on [said monitors, such that said stylus means may be utilized to enter visual instructional information onto said station's monitors and displayed on said monitors simultaneously] both of said monitor means associated with both of said stations.

Claim 2. The system of Claim 1, wherein one of said stations is for an instructor and one or more of said stations are for students.

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Claim 3. (Once Amended) The system of Claim 2, wherein said instructor's station has more than one of said [interactive monitors] monitor means.

Claim 4. (Once Amended) The system of Claim [3] 2, wherein said communication means selectively affords said instructor's station to selectively view [more than one] instructional information displayed at any of said [interactive monitors] monitor means at any of said students' stations virtually simultaneously to the time said information is being handwritten at said students' stations.

Claim 5. (Once Amended) The system of Claim 4, wherein said instructor's station's [interactive] monitor means is selectively [instructed] controlled by the user implementing icons on said monitor.

Please cancel claim 6.

Claim 7. (Once Amended) The system of Claim [6] 1, wherein said communication means [is] includes a communication network, and further includes a central processing unit and bus interface, located at each of said stations, which is in data communication with said [serial] communication network.

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Claim 8. (Once Amended) A computer assisted instructional information delivery system, comprising:

at least two stations, each of said stations having:

at least one [interactive] monitor;

[information] input means for inputting instructional information in graphical form into [each of] said [interactive monitors] monitor;

peripheral interface means for accepting the instructional information from [and to] said [information] input means and for providing instructional information to [and from] said [interactive] monitor;

central processing unit means for controlling [the instructional information from] said peripheral interface means; and

communication network means for communicating [the instructional] information in real time [from said central processing unit means] between the peripheral interface means of each of said two stations in order to simultaneously display the instructional information being input on said [interactive] monitors at either of said two stations [the instructional information].

Claim 9. (Once Amended) The system of Claim 8, wherein said [instruction] instructional information is simultaneously displayed on said monitors at each of said two stations [and inputted simultaneously on said interactive monitors of] as it is being simultaneously input at each of said [at least] two stations.

Claim 10. (Once Amended) The system of Claim 8, wherein one of said [at least] two stations [are] is for an instructor and one of said [at least] two stations is for one or more students.

Claim 11. (Once Amended) The system of Claim 10, wherein said instructor's station selectively controls the display [or input] of the instructional information on said [interactive] monitors of [each] said students' station.

Claim 12. (Once Amended) The system of Claim 8, wherein said [information] input means is comprised of a user controlled hand-held stylus, stylus sensor, and stylus interface means for communicating [the] handwritten instructional information from said stylus sensor to said peripheral interface means.

Claim 13. (Once Amended) The system of Claim ~~8~~, wherein at least one of said stations further [comprise] comprises a printer [and keyboard] in data communication with said peripheral interface means.

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Claim ~~14~~ 20. (Once Amended) The system of Claim ~~8~~ 13, wherein said peripheral interface means further [comprising] comprises a bus interface means for communication with said central processing unit means and [for communication with] said communication network means.

Claim 15. (Once Amended) The system of Claim [8] 12, wherein said handwritten instructional information inputted via said [information] input means is selectively and simultaneously displayed on [one or more] said [interactive] monitors of more than two of said stations.

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Claim 16. (Once Amended) An instructional information system for use in an educational classroom, said system comprising:

at least two remotely-located user stations in which one station is an instructor station and one or more stations are student stations, said instructor station including means for controlling said instructional information system;

interactive monitor means, located in each of said user stations, for [visual] visually displaying instructional information to the user of that station and for accepting freehand inputted [instruction] instructional information from the user of that station [, said interactive monitor means located in each of said stations]; and

network communication means, connected to each user station, for communicating said inputted and displayed instructional information between said interactive monitor means of all user stations, said network communication means controlled by said instructor station controlling means to selectively and simultaneously display [the] instructional information input and displayed at said instructor's station on said interactive monitor means of any of said student stations at virtually the same time inputted instructional information is being accepted from the user of that student station.

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Claim ~~17~~ 25. (Once Amended) The system of Claim ~~16~~ 24, [in which] wherein said interactive monitor means utilizes a user controlled freehand writing stylus, the position of which is sensed by a stylus sensor to recognize spacial movement by the user controlled stylus to [evidence] provide the inputted instructional information from extemporaneous freehand writing or drawing by the user.

Claim ~~18~~ 26. (Once Amended) The system of Claim [16] ~~17~~ 25, wherein each of said user stations includes a central processing unit and memory means for storing said instructional information, and wherein said network communication means communicates in real time with said central processing units and memory means in each of said stations.

Claim 19. (Once Amended) The system of Claim 16, wherein said [instructor's] instructor station [by said interactive monitor means] controlling means may selectively and simultaneously control the display [instruction] of instructional information [to or from] input at said instructor station on said interactive monitor means of any number of said student stations.

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Claim 20. (Once Amended) The system of Claim [19] 16, wherein said [selective] visual display of and input acceptance of instructional information by said interactive monitor means simulates an electronic sheet of paper which may be simultaneously communicated and interactively shared in real time between the users at said instructor station and student stations.

Please add the following new claims:

-- Claim 21. The system of Claim 1, wherein at least one of said input means includes a hand-held stylus for inputting free-style handwritten text and drawings.

Claim 22. The system of Claim 21, wherein said system includes more than two remotely-located stations, and wherein said communication means includes means for entering handwritten instructional information in freehand form from more than two stations.

Claim 23. The system of Claim 2, wherein said communications means selectively affords said instructor's station to virtually simultaneously transmit instructional information being handwritten at said instructor's station to all of said monitor means at all of said students' stations.

Claim ~~24~~ 21. The system of Claim ~~8~~ 13, wherein said input means includes a keyboard.

Claim ~~25~~ 22. The system of Claim ~~8~~ 13, wherein said input means includes an optical scanning device.

Claim 26. The system of Claim 10, wherein said instructor's station selectively controls the input means of the instructional information on said monitors of said students' station.

Claim 27. A method for providing instructional information from a first station to a second remotely-located station of a computer assisted instructional delivery system, each of said first and second stations having an input device for directly inputting hand-drawn graphical information from a user of that station, and having a display monitor for displaying an image of said graphical information to the user of that station, the delivery system including a computer network for transferring said graphical information between said first and second stations at virtually the same time as it is being input, the method comprising the steps of:

inputting primary hand-drawn graphical information into said system by a user at said first station;

displaying an image of said primary information to the user of said first station at virtually the same time as it is being input by the user of said first station;

transferring said primary information from said first station to said second station over said computer network;

displaying an image of said primary information to the user of said second station at virtually the same time as it is being input by the user of said first station;

inputting secondary hand-drawn graphical information into said system by a user at said second station, said secondary information based upon said primary information;

transferring said secondary information from said second station to said first station over said computer network; and

displaying an image of said secondary information to the user of said first station along with said displayed image of said primary information at virtually the same time as said secondary information is being input by the user of said second station.

Claim 28. The method according to claim 27, wherein said computer assisted delivery system includes a third station, and wherein the method further comprises the step of displaying an image of said primary information to the user of said third station at virtually the same time as it is being input by the user of said first station.

Claim 29. The method according to claim 28, further comprising the step of selecting between said first and third stations before transferring said primary information.

Claim 30. The method according to claim 29, wherein said selecting step includes the step of implementing icons on said display monitor.

Claim 31. The method according to claim 27, wherein said input device includes a user-controlled freehand writing stylus which simulates to the user the ability to write on said display monitor, and wherein the method further comprises the step of sensing the position of said stylus on said display monitor to recognize spacial movement directed by the user, thereby providing the hand-drawn graphical information into the system.

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Claim ~~32~~ 36. The method according to claim ~~27~~ 30, wherein said inputting, displaying, and transferring steps simulate to the users of said first and second stations that the users are simultaneously sharing and concurrently the same display image.

Claim ~~33~~ 37. The method according to claim ~~27~~ 30, wherein said ~~image~~ displaying steps include the step of combining images of said primary and secondary information to be displayed on a single display monitor.--

REMARKS

Applicant respectfully requests favorable reconsideration of the present application in light of the above amendments and in view of the reasons which follow. Upon review of the preceding Office Action, it is believed that the amended claims are now in proper condition for allowance.

Applicant has included with this amendment a copy of the Revocation of Prior Powers of Attorney and Appointment of New Power of Attorney which was previously filed on July 23, 1991. An Associate Power of Attorney is also enclosed with this amendment.

After entry of the above amendments, claims 1-5 and 7-33 are pending in this application. The above amendments to the claims and the new claims are clearly supported in the specification, particularly at pages 3-13, and in the claims as originally filed.

Applicant has included proposed corrections to Figures 1 and 2 of the informal drawings which have been made in red ink on the attached photocopies. These changes are of a formal nature and have been proposed to further clarify which reference numerals are used to identify which elements in the drawings. No new matter has been added. Applicant will submit corrected formal drawings upon an indication of allowable subject matter.

The amendments to the claims have been made to more particularly point out and distinctly claim Applicant's invention, and to ensure the claims are proper under 35 U.S.C. §112. New dependent claims 21-26 have been added to provide additional limitations to further define the subject matter of Applicant's invention. New method claims 27-33 have also been added to cover the method for using the claimed instructional delivery system. Applicant has also included Claim 2 in this amendment for the Examiner's convenience, even though Claim 2 has not been amended.

In the February 5, 1991 Office Action, the Examiner has referred to U.S. Patent No. 4,846,694 to Erhardt, yet this reference was not listed on Applicant's Information Disclosure Citation (Form PTO-1449) nor on the Notice of References Cited by the Examiner (Form PTO-892). Applicant respectfully requests that the Examiner provide a Supplementary Notice of References Cited with the forthcoming Office Action such that the Erhardt reference may properly be made of record.

The Examiner has rejected claims 1-20 under 35 U.S.C. §103 as being unpatentable over Shapiro in view of Erhardt. The

Examiner stated that Shapiro discloses a computer training system with several student computers interfaced to a central microprocessor, wherein the instructor's workstation display can be displayed on each of the student's video monitors and the students' workstation display can be displayed on the instructor's workstation monitor. The Examiner further stated that Erhardt discloses a computer interfaced to a liquid crystal display and a stylus for entering instructional information into the computer. The Examiner stated that the adaptation of a stylus to be used with a computer training system would have been obvious to a person having ordinary skill in the art, and therefore concluded that this combination renders Applicant's claims 1-20 obvious. Applicant respectfully traverses this rejection.

Applicant's claims 1-26, as amended, recite an instructional information system, preferably for use in an educational classroom setting, wherein an instructor occupies one station and one or more students occupy one or more other stations. A display monitor is positioned in each station to provide a display of instructional information in a visual form. Each station also includes an input device, such as a stylus or light pen, for inputting freehand written or graphical instructional information into the system. A network communication system provides simultaneous, two-way communication between the instructor and students by communicating the instructional information from the input device at one station to the display of another station, and vice-versa. The instructional information is displayed

virtually simultaneously at each of the workstations as it is being input at another workstation. Thus, in essence, the invention allows a teacher to interactively share an "electronic sheet of paper" with one or more students in a classroom. The following sample classroom scenario sets forth the typical application of the invention:

Suppose that an eleventh grade teacher introduces a new mathematical idea to her students, such as solving a radical equation. With the current technology, the teacher hands out the problem on a piece of paper and/or presents the problem on the chalkboard, and the students begin working to solve it. The students' varying level of skill determines the length of time required to reach a solution. Thirty seconds later, the fastest student has an answer, and a few seconds after that, a number of students have completed their work. The teacher now faces a minor dilemma, in that if she calls on one of the students who have completed the problem, the answer is then revealed to the other students -- including those who probably need most to work-through the problem. On the other hand, if she waits for all the students to finish, she implicitly is denying reinforcement for the students who completed the problem. Regardless of whether she waits or doesn't wait for all students to finish the problem, she is emphasizing only the result of reaching an answer to the problem rather than following the correct mathematical steps in arriving at the correct answer. Although in the ideal situation, the teacher would be able to individually monitor and communicate with each and

every student during the entire process of solving the mathematical problem, in reality, the teacher can only respond to a few students, and generally only to the resulting mathematical answers.

In contrast, by using the invention, the students can write on their respective displays, and the teacher can view their mathematical work simultaneously, allowing for individualized communication and attention. She can draw a simple "check-mark" on each individual's monitor if the work and answer is correct, or she can provide the correct answer, without disclosing the answer and preempting the continued efforts of other students. More importantly, however, is that when the teacher notices that a student is trying to use an inappropriate algorithm, or has made an error that will influence the outcome of the solution, she is able to spot the mistake and indicate such to the student by making a notation to that effect that will appear only on that student's display, next to the error, on the same "electronic sheet" on which the student is still working. Furthermore, if a student is missing one step needed to complete a multistep problem, the teacher can mark the step directly on the same "electronic sheet of paper" on which the student is still working. The teacher, because of the two-way communication, can then determine immediately whether the student is proceeding correctly with the next step. If so, the teacher can so indicate on the student's "electronic sheet", or if not, the teacher can continue to provide assistance on the student's "electronic sheet" -- with the student being able to take over or participate at any time. Hence, not only are the answers

not disclosed by the students who first completed the problem, but also the individual interaction between the teacher and student is maintained during the process of working on the problem.

This fundamental concept of communicating and writing simultaneously on the same display image from remote locations is not taught or suggested in the prior art. None of the prior art of record permits a first user at one location to enter handwritten information into his interactive display monitor, and transmit the same information virtually simultaneously to a second user at another location such that it appears that the two users are sharing the same interactive display monitor. To the best of Applicant's knowledge, even today's Electronic Mail systems, operating over various types of communications networks, cannot simultaneously share handwritten or hand-drawn graphical or freehand information over the network such that two or more users can modify the same graphical display image at virtually the same time. As will be seen below, prior technology has either been limited to non-simultaneous transmission of graphical images (e.g., Shapiro et al., below) or non-graphical images (e.g., typical Electronic Mail systems).

Shapiro et al., U.S. Patent No. 4,715,818, describes a computer video monitor interconnection system wherein an associated video monitor at an instructor's workstation can be selectively connected to one or more of a plurality of computer video monitors at respective student workstations, such that a display of the instructor's video monitor is displayed on the connected student

video monitors. Moreover, the computers and associated video monitors at the plurality of student workstations can be selectively connected to the computer video monitor at the instructor's workstation. In other words, the Shapiro computer training system is essentially an arrangement for switching video signals. However, the Shapiro system cannot simultaneously transmit information in both directions between the student station and the instructor station. In the Shapiro et al. system, at any given time, only one station can input information. The student's computer must be disconnected from the instructor's monitor before the instructor's computer can be connected to that same monitor. There is no teaching or suggestion in Shapiro to have both computers connected to the same monitor at the same time. In view of this distinction alone, it cannot be said that Applicant's claimed technique of simultaneously inputting and displaying instructional information, i.e., the sharing of an electronic piece of paper, is obvious.

Erhardt, U.S. Patent No. 4,846,694, describes a computer controlled overhead projector display system for demonstrating the use of a computer terminal using a standard overhead projector. This prior art system is a prime example of one-way communication of instructional information, i.e., Erhardt does not contemplate any communication by the student responding back to the teacher in any form.

Even if the stylus input device of Erhardt were combined with the video switching system of Shapiro et al., the claimed

features of Applicant's invention would still not be met. The proposed combination would not include any communication means for virtually simultaneously transmitting instructional information being entered at either of the two input devices from a first station to a second station, and for virtually simultaneously displaying the transmitted instructional information on both of the monitor devices associated with the first and second stations. Moreover, the proposed combination could not allow the instructor's station to selectively view any or all of the interactive monitors at the students' stations at the same time the information is being entered at the student's stations. In other words, the proposed combination could not provide real-time, simultaneous, two-way communication of handwritten instructional information between the interactive monitors of two or more stations.

In view of these reasons and the above amendments, withdrawal of the 35 U.S. C. §103 rejection of claims 1-20 is respectfully requested.

Regarding new dependent claims 21-26, Applicant submits that these dependent claims provide additional limitations of patentable significance when considered as a whole in combination with the other elements of their respective parent claims.

Applicant has added method claims 27-33 reciting the method of using the computer assisted instructional delivery system claimed above. Independent method claim 27 and its dependent claims include specific limitations describing the system structure and operation which correspond to the system structure and

operation of apparatus claims 1-26. Hence, Applicant submits that method claims 27-33 are also allowable over the prior art of record.

Applicant believes that the present application is now in condition for allowance. Favorable consideration of the amended claims is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

Respectfully submitted,

Date: 8/5/91

By Douglas A. Boehm

Douglas A. Boehm
Attorney for Applicant
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Joseph R. Marcus, Esq.

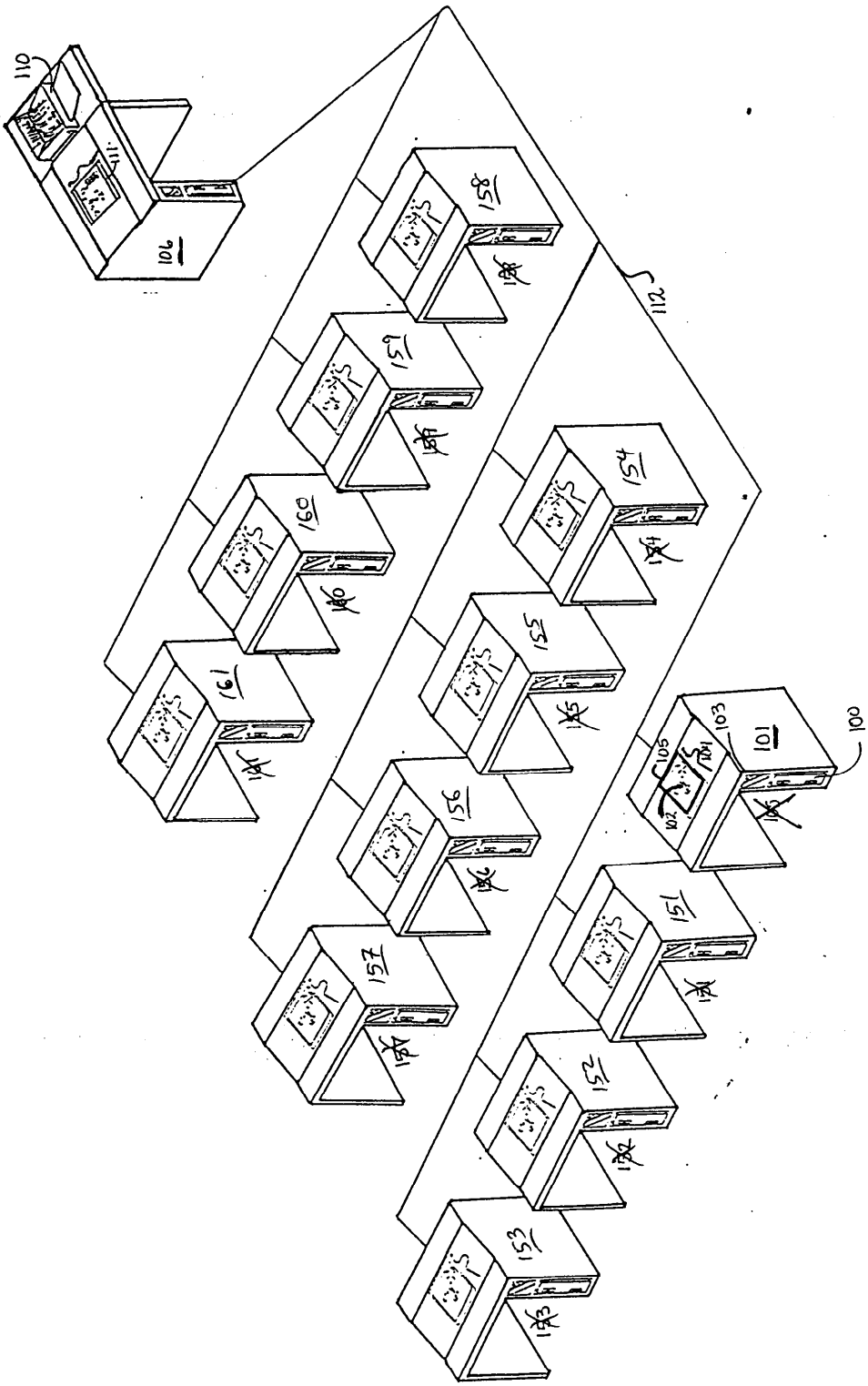
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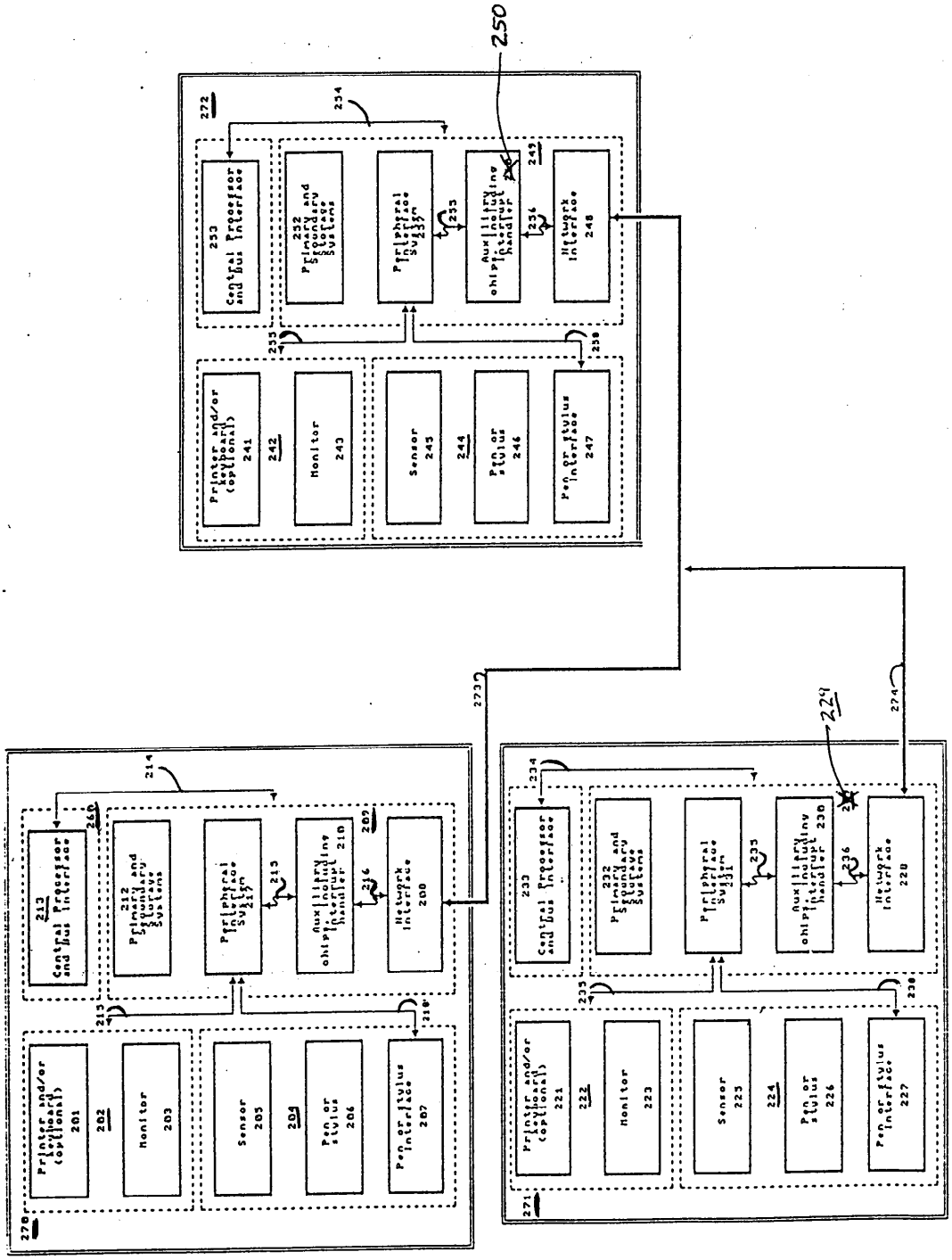
Figure 1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Central Processor and Bus Interface
Primary and Secondary Storage Systems
Peripheral Interface System
Auxiliary Input/Output Handler
Network Interface
Printer and/or Keyboard (optional)
Monitor
Sensor
Pointing Stylus
Pen or Stylus Interface

Figure 2

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Date: August 5, 1991
File No.: 0867/50841

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of Eric R. Hamilton

Serial No.: 07/510,141

Filed: April 17, 1990

For: COMPUTER ASSISTED INSTRUCTIONAL DELIVERY SYSTEM

Group Art Unit: 332

Examiner: P. Kubel

I hereby certify that this paper is being deposited with the United States Postal Service as Express Mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on this date.

8/5/91 Robert Smith
Date

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THE COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

Sir:

Transmitted herewith is an amendment in the above-identified application.

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GROUP 330

( ) No additional fee is required.

Fee Calculation For Claims As Amended

	As Amended		Previously Paid For		Present Extra	Rate		Additional Fee
Total Claims	32	-	20	=	12	x $20.00	= $	240.00
Independent Claims	4	-	3	=	1	x $60.00	= $	60.00
Fee for Multiple Claims						$200.00	= $	0.00
						Total Additional Fee	$	300.00
							$	150.00

(X) Small Entity Fee (reduced by half)

(X) A check in the amount of $150.00 is attached.

( ) Charge $_____ to Deposit Account No. 23-0920.

(X) The Commissioner is hereby authorized to charge any additional fees which may be required to this application under 37 C.F.R. §§1.16-1.17, or credit any overpayment, to Deposit Account No. 23-0920. Should no proper amount be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 23-0920. A duplicate copy of this sheet is enclosed.

135 S. LaSalle Street
Chicago, Illinois 60603
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WELSH & KATZ, LTD

By: Douglas A. Boehm 8/5/91
Registration No. 32,014

ADM064/1290