AO 120 (Rev. 08/10)

TO:	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court for the Western District of Texas, Waco Division on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
6:22-cv-421	4/27/2022	for the Western District of Texas, Waco Division

PLAINTIFF	DEFENDANT
BUFFALO PATENTS, LLC	ONEPLUS TECHNOLOGY (SHENZHEN) CO., LTD.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	6,856,086	2/15/2005	BUFFALO PATENTS, LLC
2	6,904,405	6/7/2005	BUFFALO PATENTS, LLC
3	8,204,737	6/19/2012	BUFFALO PATENTS, LLC
4			
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In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT
10/17/2022 Doc #9 ORDER GRANTING 8 Motion to Dismiss.

CLERK	(BY) DEPUTY CLERK	DATE
PHILIP J. DEVLIN		10/17/2022

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

AO 120 (Rev. 08/10)

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DECISION/JUDGEMENT

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AO 120 (Rev. 08/10)

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Mail Stop 8 **Director of the U.S. Patent and Trademark Office** **P.O. Box 1450** **Alexandria, VA 22313-1450**	

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court for the Western District of Texas, Waco Division on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
6:22-cv-422	4/27/2022	for the Western District of Texas, Waco Division

PLAINTIFF	DEFENDANT
BUFFALO PATENTS, LLC	TCL Technology Group Corporation, TCL Electronics Holdings Limited, TCL Communication Technology Holdings Limited, and TCL Communication Limited

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	6,856,086	2/15/2005	BUFFALO PATENTS, LLC
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6:22-cv-423	4/27/2022	for the Western District of Texas, Waco Division

PLAINTIFF	DEFENDANT
BUFFALO PATENTS, LLC	ZTE CORPORATION

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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PLAINTIFF	DEFENDANT
BUFFALO PATENTS, LLC	TCL Technology Group Corporation, TCL Electronics Holdings Limited, TCL Communication Technology Holdings Limited, and TCL Communication Limited

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☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
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PLAINTIFF	DEFENDANT
BUFFALO PATENTS, LLC	ONEPLUS TECHNOLOGY (SHENZHEN) CO., LTD.

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DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

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AO 120 (Rev. 08/10)

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Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Eastern District of Texas - Marshall Division on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
2-16-cv-01377-RWS	12/9/2016	Eastern District of Texas - Marshall Division

PLAINTIFF	DEFENDANT
Rothschild Patent Imaging LLC	Edimax Computer Company d/b/a Edimax Technology Co., Ltd.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	US 8,433,797	5/7/2013	Rothschild Patent Imaging, LLC
2	US 8,594,722	11/26/2013	Rothschild Patent Imaging, LLC
3	US 8,204,437	6/19/2012	Rothschild Patent Imaging, LLC
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In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT
IT IS ORDERED that Plaintiff's claims against Defendant are dismissed with prejudice and with each party to bear its own attorneys' fees and costs

CLERK	(BY) DEPUTY CLERK	DATE
David A. O'Toole	Sonja Oliver	3/13/17

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 8,204,737 B2
APPLICATION NO. : 11/088032
DATED : June 19, 2012
INVENTOR(S) : Suominen

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the Title Page, Item (57), under "ABSTRACT", in Column 2, Line 3, delete "an" and insert -- a --, therefor.

On Title Page 2, Item (56), under "OTHER PUBLICATIONS", in Column 1, Line 4, delete "Erros,"" and insert -- Errors," --, therefor.

On Title Page 2, Item (56), under "OTHER PUBLICATIONS", in Column 1, Line 4, delete "Proc.of" and insert -- Proc. of --, therefor.

On Title Page 2, Item (56), under "OTHER PUBLICATIONS", in Column 1, Line 15, delete "forl" and insert -- for --, therefor.

On Title Page 2, Item (56), under "OTHER PUBLICATIONS", in Column 2, Line 15, delete "Processirig" and insert -- Processing --, therefor.

In the Drawings

In Fig. 10, Sheet 12 of 17, for Tag "1020", in Line 1, delete "OCCURENCES" and insert -- OCCURRENCES --, therefor.

In Fig. 11, Sheet 13 of 17, delete "OCCURENCES" and insert -- OCCURRENCES --, therefor.

In Fig. 14, Sheet 16 of 17, delete " 

" and insert -- 

--, therefor.

In the Specification

In Column 5, Line 1, delete "DRAWING" and insert -- DRAWINGS --, therefor.

Signed and Sealed this
Ninth Day of July, 2013

Teresa Stanek Rea
Acting Director of the United States Patent and Trademark Office

In Column 5, Line 58, delete "DESCRIPTION" and insert -- DETAILED DESCRIPTION --, therefor.

In Column 5, Line 66, delete "(e.&," and insert -- (e.g., --, therefor.

In Column 9, Line 31, delete "Bole" and insert -- Boie --, therefor.

In Column 9, Line 40, delete "infixed" and insert -- infrared --, therefor.

In Column 9, Line 48, delete "infix" and insert -- infrared --, therefor.

In Column 11, Line 16, delete "(e.g." and insert -- (e.g., --, therefor.

In Column 12, Line 54, delete "grater" and insert -- greater --, therefor.

In Column 17, Line 27, delete "(i.e." and insert -- (i.e., --, therefor.

In Column 19, Line 19, delete "establishes" and insert -- establishes unidirectional --, therefor.

In Column 22, Line 15, delete "algorithm" and insert -- algorithm, --, therefor.

In Column 25, Line 59, delete "here," and insert -- (here, --, therefor.

In Column 26, Line 63, delete "recognize," and insert -- recognizer, --, therefor.

In Column 35, Line 19, delete "segments;" and insert -- segments. --, therefor.

In Column 38, Line 6, delete "Process" and insert -- (Process --, therefor.

In the Claims

In Column 39, Line 52, in Claim 3, delete "2" and insert -- 2, --, therefor.

In Column 40, Line 6, in Claim 9, delete "the-language" and insert -- the language --, therefor.

UNITED STATES DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450

APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
11/088,032	22 March, 2005	SUOMINEN, EDWIN A.	6257-33703

MEYERTONS, HOOD, KIVLIN, KOWERT & GOETZEL, P.C.
P.O. BOX 398
AUSTIN, TX 78767-0398

EXAMINER	
MICHAEL COLUCCI	
ART UNIT	PAPER
2658	20130610

DATE MAILED:

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

Commissioner for Patents

Certificates considered. OK.

/MICHAEL COLUCCI/
Primary Examiner, Art Unit 2658

PTO-90C (Rev.04-03)

SPE RESPONSE FOR CERTIFICATE OF CORRECTION

DATE : 12-11-12 Paper No.: _____

TO SPE OF : ART UNIT ~~2621~~ 2658

SUBJECT : Request for Certificate of Correction for Appl. No.: 11/088032 Patent No.: 8204737

COCIN mailroom date: 11/20/12

Please respond to this request for a certificate of correction within 7 days.

FOR IFW FILES: Should COFC be approved

Please review the requested changes/corrections as shown in the **COCIN** document(s) in the IFW application image. No new matter should be introduced nor should the scope or meaning of the claims be changed.

Please complete the response (see below) and forward the completed response to scanning using document code **COCX**.

FOR PAPER FILES:

Please review the requested changes/corrections as shown in the attached certificate of correction. Please complete this form (see below) and forward it with the file to:

Certificates of Correction Branch (CofC)
Randolph Square – 9D10-A
Palm Location 7580

In particular note: _____

Certificates of Correction Branch
703-756-1814

Thank You For Your Assistance

The request for issuing the above-identified correction(s) is hereby:
Note your decision on the appropriate box.

- ☐ **Approved** — **All** changes apply.
- ☐ **Approved in Part** — Specify below which changes **do not** apply.
- ☐ **Denied** — State the reasons for denial below.

Comments: _____

_____

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_____ _____
SPE **Art Unit**

PTO/SB/44 (09-07)
Approved for use through 08/31/2013. OMB 0651-0033
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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.
(Also Form PTO-1050)

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 8,204,737 B2

APPLICATION NO. : 11/088,032

ISSUE DATE : June 19, 2012

INVENTOR(S) : Suominen

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the Face Page, in Field (57), under "ABSTRACT", in Column 2, Line 3, delete "an" and insert - - a - -, therefor.

On Page 2, in Field (56), under "OTHER PUBLICATIONS", in Column 1, Line 4, delete "Erros,"" and insert - - Errors," - -, therefor.

On Page 2, in Field (56), under "OTHER PUBLICATIONS", in Column 1, Line 4, delete "Proc.of" and insert - - Proc. of - -, therefor.

On Page 2, in Field (56), under "OTHER PUBLICATIONS", in Column 1, Line 15, delete "forl" and insert - - for - -, therefor.

On Page 2, in Field (56), under "OTHER PUBLICATIONS", in Column 2, Line 15, delete "Processirig" and insert - - Processing - -, therefor.

In Fig. 10, Sheet 12 of 17, for Tag "1020", in Line 1, delete "OCCURENCES" and insert - - OCCURRENCES - -, therefor.

In Fig. 11, Sheet 13 of 17, delete "OCCURENCES" and insert - - OCCURRENCES - -, therefor.

MAILING ADDRESS OF SENDER (Please do not use customer number below):

Maschoff Gilmore & Israelsen
1441 West Ute Boulevard, Suite 100
Park City, UT 84098 United States

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour 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: Attention Certificate of Corrections Branch, 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.

PTO/SB/44 (09-07)
Approved for use through 08/31/2013. OMB 0651-0033
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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.
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CERTIFICATE OF CORRECTION

PATENT NO. : 8,204,737 B2

APPLICATION NO. : 11/088,032

ISSUE DATE : June 19, 2012

INVENTOR(S) : Suominen

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In Fig. 14, Sheet 16 of 17, delete " 

" and insert - - 

- -, therefor.

In Column 5, Line 1, delete "DRAWING" and insert - - DRAWINGS - -, therefor.

In Column 5, Line 58, delete "DESCRIPTION" and insert - - DETAILED DESCRIPTION - -, therefor.

In Column 5, Line 66, delete "(e.&," and insert - - (e.g., - -, therefor.

In Column 9, Line 31, delete "Bole" and insert - - Boie - -, therefor.

In Column 9, Line 40, delete "infixed" and insert - - infrared - -, therefor.

In Column 9, Line 48, delete "infix" and insert - - infrared - -, therefor.

In Column 11, Line 16, delete "(e.g." and insert - - (e.g., - -, therefor.

In Column 12, Line 54, delete "grater" and insert - - greater - -, therefor.

MAILING ADDRESS OF SENDER (Please do not use customer number below):

Maschoff Gilmore & Israelsen
1441 West Ute Boulevard, Suite 100
Park City, UT 84098 United States

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour 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: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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In Column 38, Line 6, delete "Process" and insert - - (Process - -, therefor.

In Column 39, Line 52, in Claim 3, delete "2" and insert - - 2, - -, therefor.

In Column 40, Line 6, in Claim 9, delete "the-language" and insert - - the language - -, therefor.

MAILING ADDRESS OF SENDER (Please do not use customer number below):

Maschoff Gilmore & Israelsen
1441 West Ute Boulevard, Suite 100
Park City, UT 84098 United States

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour 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: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

PATENT NO.: 8,204,737

USPTO CONFIRMATION CODE: 6401

APPLICATION NO.: 11/088,032

FILED: March 22, 2005

EXAMINER: Michael Colucci

GROUP ART UNIT: 2626

FOR: MESSAGE RECOGNITION USING SHARED LANGUAGE MODEL

37 CFR 1.322 & 37 CFR 1.323 REQUEST FOR CERTIFICATE OF CORRECTION FOR USPTO AND/OR APPLICANT MISTAKE

Commissioner for Patents
Office of Patent Publication
ATTN: Certificate of Correction Branch
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

A certificate of correction under 35 USC 254 is respectfully requested in the above-identified patent.

It is believed that all errors identified herein were the fault of both the applicant and USPTO and, accordingly, please charge **$100.00** to our Deposit Account No. 50-5394. In the event that a further fee is required, please charge the amount to the same Deposit Account.

The exact locations where the errors appear in the patent and patent application are as follows:

On the Face Page, in Field (57), under "ABSTRACT", in Column 2, Line 3, delete "an" and insert - - a - -, therefor.
(ORIGINALLY FILED SPECIFICATION, IN THE ABSTRACT DATED MARCH 22, 2005, PAGE 81 (PAGE 590 OF FW), LINE 2)

On Page 2, in Field (56), under "OTHER PUBLICATIONS", in Column 1, Line 4, delete "Erros,"" and insert - - Errors," - -, therefor.
(LIST OF REFERENCES CITED BY APPLICANT AND CONSIDERED BY EXAMINER DATED NOVEMBER 15, 2007, SHEET 5 OF 9 (PAGE 434 OF FW), UNDER "OTHER DOCUMENTS", ENTRY 3, LINE 2)

On Page 2, in Field (56), under "OTHER PUBLICATIONS", in Column 1, Line 4, delete "Proc.of" and insert - - Proc. of - -, therefor.
(LIST OF REFERENCES CITED BY APPLICANT AND CONSIDERED BY EXAMINER DATED NOVEMBER 15, 2007, SHEET 5 OF 9 (PAGE 434 OF FW), UNDER "OTHER DOCUMENTS", ENTRY 3, LINE 2)

On Page 2, in Field (56), under "OTHER PUBLICATIONS", in Column 1, Line 15, delete "forl" and insert - - for - -, therefor.
(LIST OF REFERENCES CITED BY APPLICANT AND CONSIDERED BY EXAMINER DATED NOVEMBER 15, 2007, SHEET 5 OF 9 (PAGE 434 OF FW), UNDER "OTHER DOCUMENTS", ENTRY 7, LINE 1)

On Page 2, in Field (56), under "OTHER PUBLICATIONS", in Column 2, Line 15, delete "Processirig" and insert - - Processing - -, therefor.
(LIST OF REFERENCES CITED BY APPLICANT AND CONSIDERED BY EXAMINER DATED NOVEMBER 15, 2007, SHEET 6 OF 9 (PAGE 435 OF FW), UNDER "OTHER DOCUMENTS", ENTRY 3, LINE 2)

In Fig. 10, Sheet 12 of 17, for Tag "1020", in Line 1, delete "OCCURENCES" and insert - - OCCURRENCES - -, therefor.
(ORIGINALLY FILED SPECIFICATION, IN THE DRAWINGS DATED MARCH 22, 2005, SHEET 12 (PAGE 602 OF FW), FIGURE 10, TAG "1020", LINE 1)

In Fig. 11, Sheet 13 of 17, delete "OCCURENCES" and insert - - OCCURRENCES - -, therefor.
(ORIGINALLY FILED SPECIFICATION, IN THE DRAWINGS DATED MARCH 22, 2005, SHEET 13 (PAGE 603 OF FW), FIGURE 11)

In Fig. 14, Sheet 16 of 17, delete " 

" and insert - - 

- -, therefor.
(ORIGINALLY FILED SPECIFICATION, IN THE DRAWINGS DATED MARCH 22, 2005, SHEET 16 (PAGE 606 OF FW), FIGURE 14)

In Column 5, Line 1, delete "DRAWING" and insert - - DRAWINGS - -, therefor.
(ORIGINALLY FILED SPECIFICATION DATED MARCH 22, 2005, PAGE 6 (PAGE 514 OF FW), LINE 20)

In Column 5, Line 58, delete "DESCRIPTION" and insert - - DETAILED DESCRIPTION - -, therefor.
(ORIGINALLY FILED SPECIFICATION DATED MARCH 22, 2005, PAGE 8 (PAGE 516 OF FW), LINE 5)

In Column 5, Line 66, delete "(e.&," and insert - - (e.g., - -, therefor.
(ORIGINALLY FILED SPECIFICATION DATED MARCH 22, 2005, PAGE 8 (PAGE 516 OF FW), LINE 9)

In Column 9, Line 31, delete "Bole" and insert - - Boie - -, therefor.
(ORIGINALLY FILED SPECIFICATION DATED MARCH 22, 2005, PAGE 13 (PAGE 521 OF FW), LINE 11)

In Column 9, Line 40, delete "infixed" and insert - - infrared - -, therefor.
(ORIGINALLY FILED SPECIFICATION DATED MARCH 22, 2005, PAGE 13 (PAGE 521 OF FW), LINE 17)

In Column 9, Line 48, delete "infix" and insert - - infrared - -, therefor.
(ORIGINALLY FILED SPECIFICATION DATED MARCH 22, 2005, PAGE 13 (PAGE 521 OF FW), LINE 22)

In Column 11, Line 16, delete "(e.g." and insert - - (e.g., - -, therefor.
(ORIGINALLY FILED SPECIFICATION DATED MARCH 22, 2005, PAGE 15 (PAGE 523 OF FW), LINE 20)

In Column 12, Line 54, delete "grater" and insert - - greater - -, therefor.
(ORIGINALLY FILED SPECIFICATION DATED MARCH 22, 2005, PAGE 18 (PAGE 526 OF FW), LINE 11)

In Column 17, Line 27, delete "(i.e." and insert - - (i.e., - -, therefor.
(ORIGINALLY FILED SPECIFICATION DATED MARCH 22, 2005, PAGE 24 (PAGE 532 OF FW), LINE 20)

In Column 19, Line 19, delete "establishes" and insert - - establishes unidirectional - -, therefor.
(AMENDMENTS TO THE SPECIFICATION DATED MARCH 22, 2005, PAGE 2 (PAGE 613 OF FW), LINE 17)

In Column 22, Line 15, delete "algorithm" and insert - - algorithm, - -, therefor.
(ORIGINALLY FILED SPECIFICATION DATED MARCH 22, 2005, PAGE 31 (PAGE 539 OF FW), LINE 26)

In Column 25, Line 59, delete "here," and insert - - (here, - -, therefor.
(ORIGINALLY FILED SPECIFICATION DATED MARCH 22, 2005, PAGE 37 (PAGE 545 OF FW), LINE 7)

In Column 26, Line 63, delete "recognize," and insert - - recognizer, - -, therefor.
(ORIGINALLY FILED SPECIFICATION DATED MARCH 22, 2005, PAGE 38 (PAGE 546 OF FW), LINE 23)

In Column 35, Line 19, delete "segments;" and insert - - segments. - -, therefor.
(ORIGINALLY FILED SPECIFICATION DATED MARCH 22, 2005, PAGE 51 (PAGE 559 OF FW), LINE 6)

In Column 38, Line 6, delete "Process" and insert - - (Process - -, therefor.
(ORIGINALLY FILED SPECIFICATION DATED MARCH 22, 2005, PAGE 55 (PAGE 563 OF FW), LINE 16)

In Column 39, Line 52, in Claim 3, delete "2" and insert - - 2, - -, therefor.
(AMENDMENTS TO THE CLAIMS DATED DECEMBER 23, 2011, PAGE 3 OF 11, CLAIM 83, LINE 1)

In Column 40, Line 6, in Claim 9, delete "the-language" and
insert - - the language - -, therefor.
(AMENDMENTS TO THE CLAIMS DATED DECEMBER 23, 2011, PAGE 4 OF 11, CLAIM 90, LINE 3)

The requested corrections are attached on Form PTO/SB/44.

Dated this 20th day of November, 2012.

Respectfully Submitted,

/R. Burns Israelsen/ Reg. # 42,685
R. BURNS ISRAELSEN
Acting in Representative Capacity
(37 CFR 1.34)
Registration No. 42,685
Telephone No. (435) 252-1360

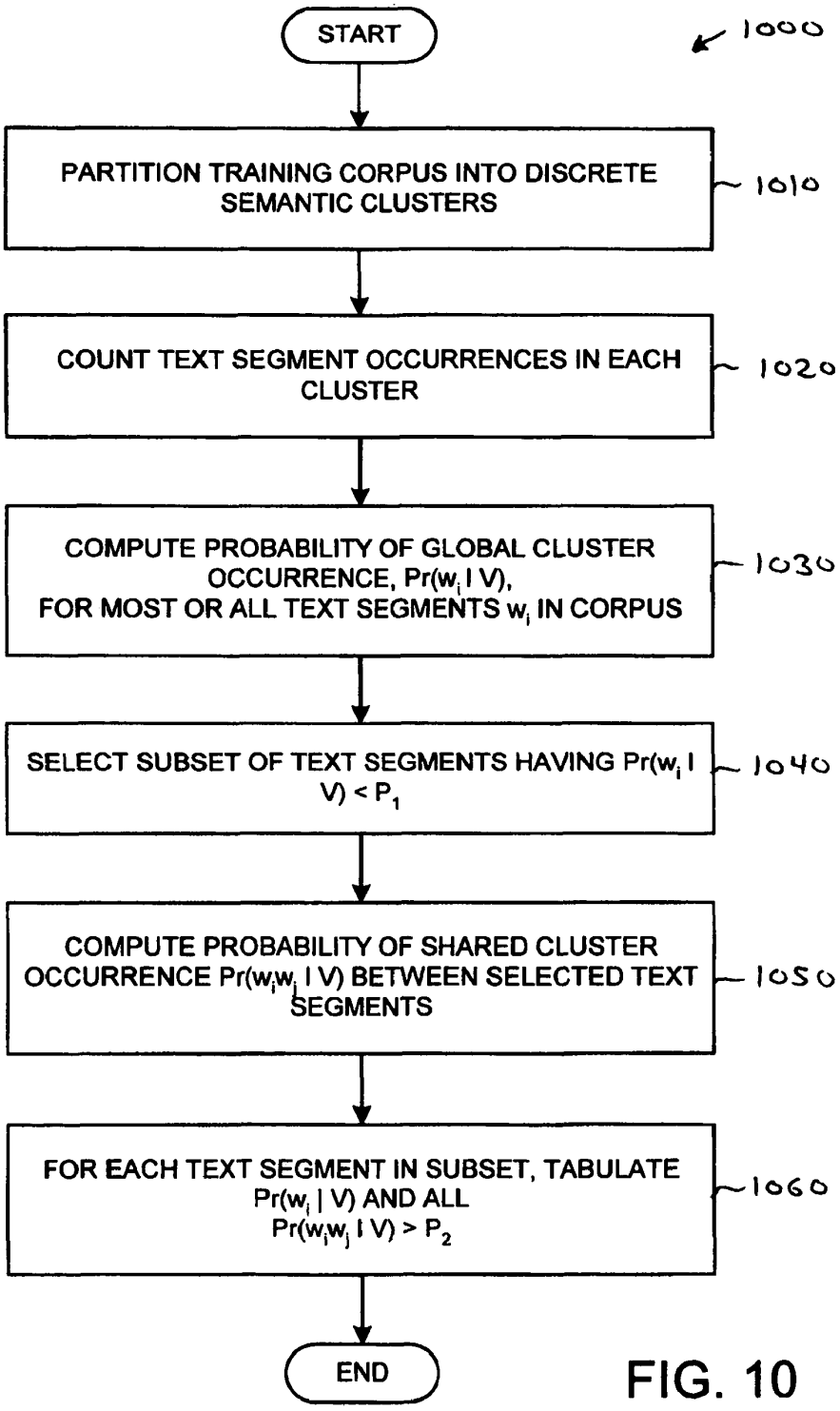

START
1000
PARTITION TRAINING CORPUS INTO DISCRETE SEMANTIC CLUSTERS
1010
COUNT TEXT SEGMENT OCCURRENCES IN EACH CLUSTER
1020
COMPUTE PROBABILITY OF GLOBAL CLUSTER OCCURRENCE, Pr(w_i | V), FOR MOST OR ALL TEXT SEGMENTS w_i IN CORPUS
1030
SELECT SUBSET OF TEXT SEGMENTS HAVING Pr(w_i | V) < P_1
1040
COMPUTE PROBABILITY OF SHARED CLUSTER OCCURRENCE Pr(w_i w_j | V) BETWEEN SELECTED TEXT SEGMENTS
1050
FOR EACH TEXT SEGMENT IN SUBSET, TABULATE Pr(w_i | V) AND ALL Pr(w_i w_j | V) > P_2
1060
END

FIG. 10

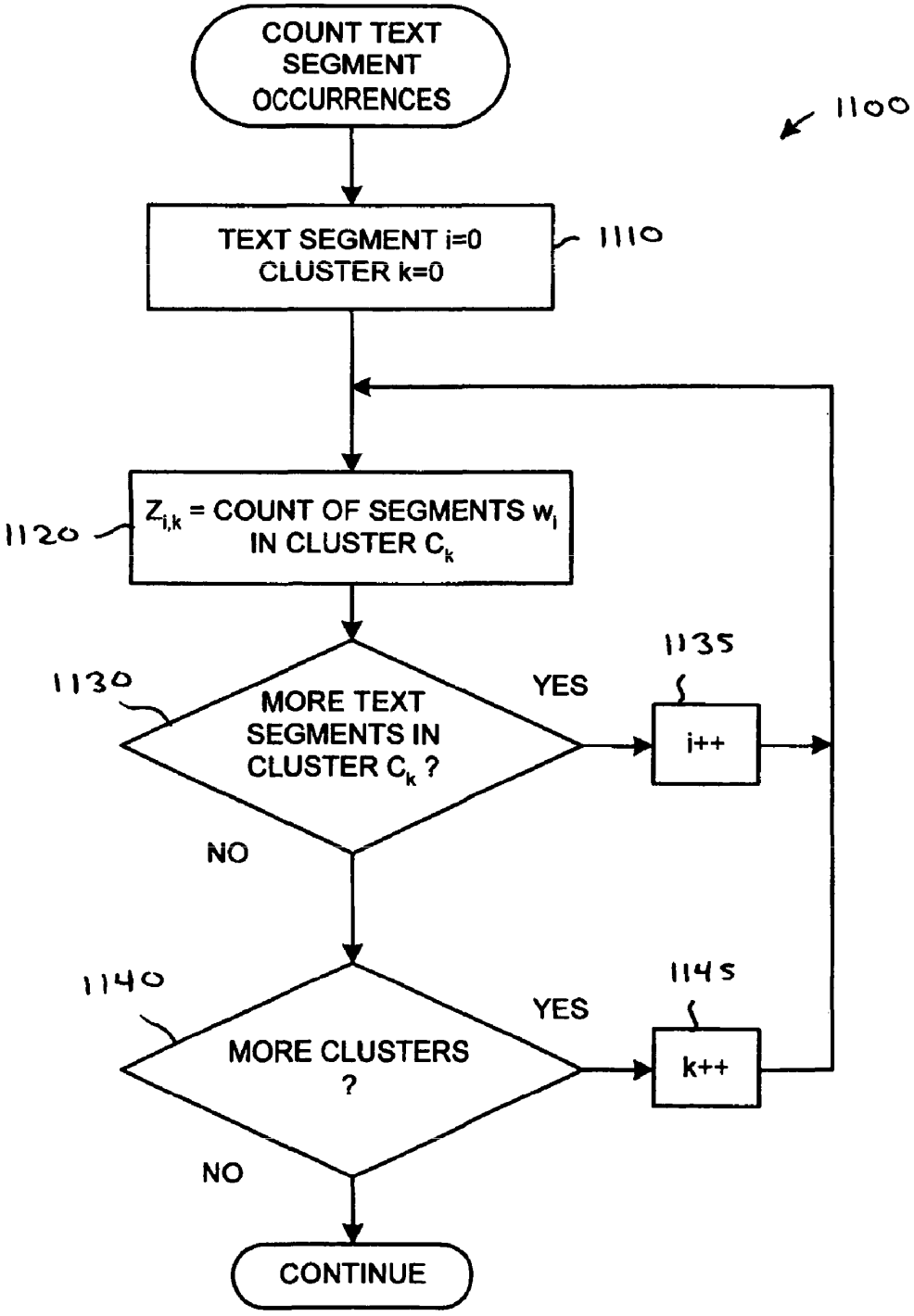

COUNT TEXT SEGMENT OCCURRENCES
1100
TEXT SEGMENT i=0
CLUSTER k=0
1110
$Z_{i,k}$ = COUNT OF SEGMENTS w_i IN CLUSTER C_k
1120
1130
MORE TEXT SEGMENTS IN CLUSTER C_k ?
YES
1135
i++
NO
1140
MORE CLUSTERS ?
YES
1145
k++
NO
CONTINUE

FIG. 11

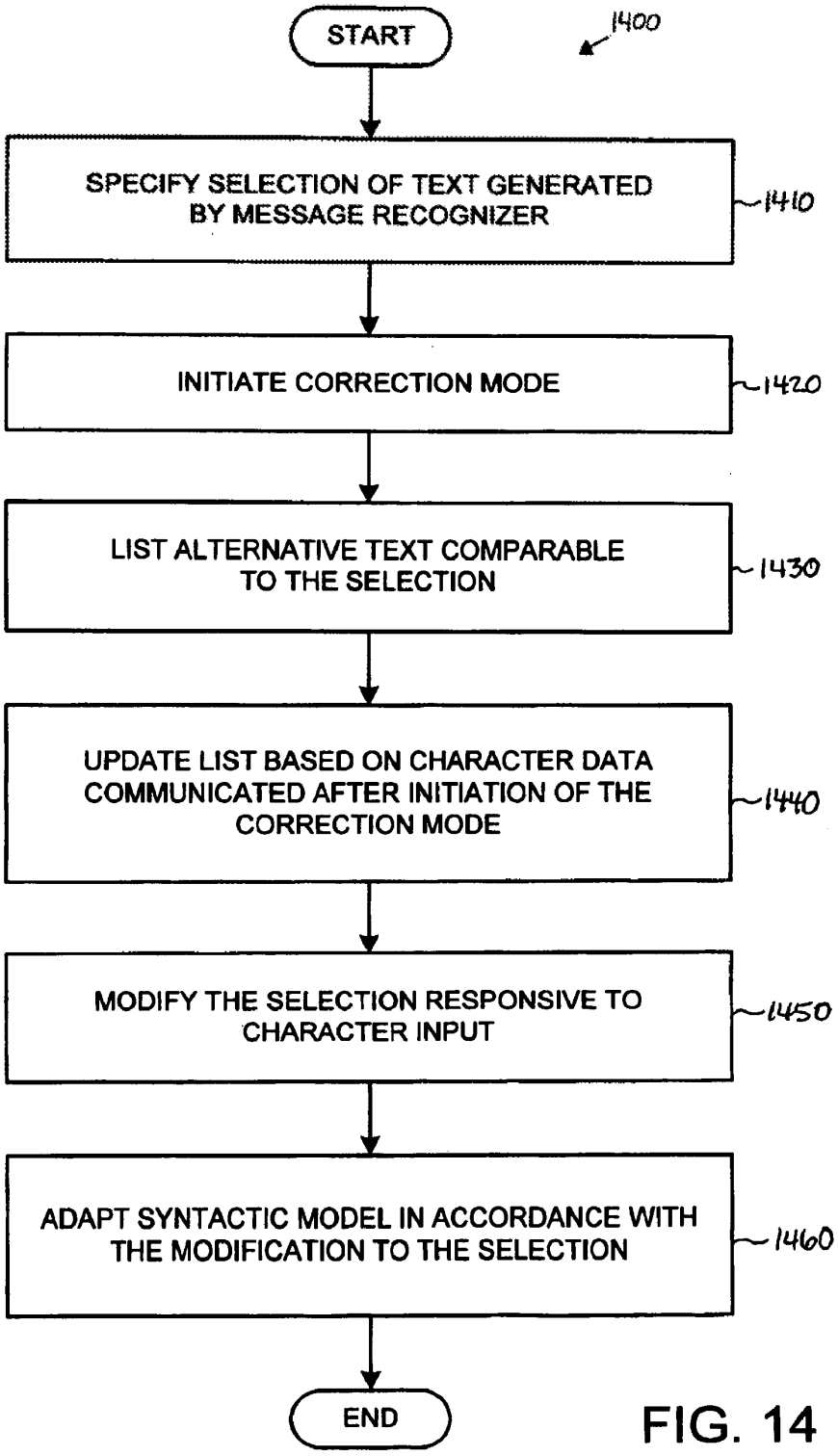

START
1400
SPECIFY SELECTION OF TEXT GENERATED BY MESSAGE RECOGNIZER
1410
INITIATE CORRECTION MODE
1420
LIST ALTERNATIVE TEXT COMPARABLE TO THE SELECTION
1430
UPDATE LIST BASED ON CHARACTER DATA COMMUNICATED AFTER INITIATION OF THE CORRECTION MODE
1440
MODIFY THE SELECTION RESPONSIVE TO CHARACTER INPUT
1450
ADAPT SYNTACTIC MODEL IN ACCORDANCE WITH THE MODIFICATION TO THE SELECTION
1460
END

FIG. 14

Electronic Patent Application Fee Transmittal

Application Number:	11088032
Filing Date:	22-Mar-2005
Title of Invention:	MESSAGE RECOGNITION USING SHARED LANGUAGE MODEL
First Named Inventor/Applicant Name:	Edwin A. Suominen
Filer:	Robert Burns Israelsen/Tonya Kusitor
Attorney Docket Number:	6257-33703

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Certificate of correction	1811	1	100	100
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**100**

Electronic Acknowledgement Receipt	
EFS ID:	14273976
Application Number:	11088032
International Application Number:	
Confirmation Number:	6401
Title of Invention:	MESSAGE RECOGNITION USING SHARED LANGUAGE MODEL
First Named Inventor/Applicant Name:	Edwin A. Suominen
Customer Number:	35690
Filer:	Robert Burns Israelsen/Tonya Kusitor
Filer Authorized By:	Robert Burns Israelsen
Attorney Docket Number:	6257-33703
Receipt Date:	20-NOV-2012
Filing Date:	22-MAR-2005
Time Stamp:	11:42:52
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$100
RAM confirmation Number	11351
Deposit Account	505394
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Certificate of Correction	0156USCN113372_20121120_CoC.pdf	302844 951ae0feb2bedd3271f5d6d35a5c69d8e0dad918	no	4
Warnings:					
Information:					
2	Request for Certificate of Correction	0156USCN113372_20121120_RequestLetter.pdf	179231 8f32cd7fd99e0e1712354c7b76519e29227dc7b8	no	4
Warnings:					
Information:					
3	Miscellaneous Incoming Letter	0156USCN113372_20121120_ReplacementSheet.pdf	72637 603f713d52a85478d4f7600224de253ff9e7cbcb	no	3
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30095 e514f819a4d452cdd3dd5757f78c5e51cd75a171	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	584807		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/088,032	06/19/2012	8204737	6257-33703	6401

35690 7590 05/30/2012

MEYERTONS, HOOD, KIVLIN, KOWERT & GOETZEL, P.C.
P.O. BOX 398
AUSTIN, TX 78767-0398

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 1031 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Edwin A. Suominen, Valley, WA;

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

35690 7590 02/24/2012

MEYERTONS, HOOD, KIVLIN, KOWERT & GOETZEL, P.C.
P.O. BOX 398
AUSTIN, TX 78767-0398

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/088,032	03/22/2005	Edwin A. Suominen	6257-33703	6401

TITLE OF INVENTION: MESSAGE RECOGNITION USING SHARED LANGUAGE MODEL

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1740	$300	$0	$2040	05/24/2012

EXAMINER	ART UNIT	CLASS-SUBCLASS
COLUCCI, MICHAEL C	2626	704-009000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: Optical Research Partners LLC

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Las Vegas, NV

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

☒ Issue Fee

☒ Publication Fee (No small entity discount permitted)

☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)

☐ A check is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number 501505 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature /Dean M. Munyon/ Date May 22, 2012

Typed or printed name Dean M. Munyon Registration No. 42,914

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor:	Edwin A. Suominen	Atty.Dkt.No.:	6257-33703
Serial Number:	11/088,032	Examiner:	Colucci, Michael C.
Filing Date:	March 22, 2005	Group/Art Unit:	2626
Title:	MESSAGE RECOGNITION USING SHARED LANGUAGE MODEL	Conf. No.	6401

******CERTIFICATE OF E-FILING TRANSMISSION******

I hereby certify that this correspondence is being transmitted via electronic filing to the United States Patent and Trademark Office on the date shown below:

On: May 22, 2012 /Dean M. Munyon/
Date Dean M. Munyon, # 42,914

COMMENTS ON STATEMENT OF REASONS FOR ALLOWANCE

Applicant acknowledges Examiner's statements of Reasons for Allowance of the above-referenced patent application and agrees that the claimed subject matter is patentable. However, Applicant takes no position regarding the Reasons for Allowance presented by the Examiner other than the positions Applicant may have previously taken during prosecution. Therefore, the Examiner's Reasons for Allowance should not be attributed to Applicant as an indication of the basis for Applicant's belief that the claims are patentable. Furthermore, Applicant respectfully asserts that there may also be additional reasons for patentability of the claimed subject matter not explicitly stated in this record and Applicant does not waive its rights to such arguments by not further addressing such reasons herein.

No fees are believed necessary; however, the Commissioner is authorized to charge any fees which may be required, or credit any overpayment, to Meyertons, Hood, Kivlin, Kowert & Goetzel, P.C. Deposit Account No. 501505/6257-33703/DMM.

Respectfully submitted,

Date: May 22, 2012

By: /Dean M. Munyon/
Dean M. Munyon
Reg. No. 42,914

Meyertons, Hood, Kivlin, Kowert & Goetzel, P.C.
P.O. Box 398
Austin, TX 78767-0398
(512) 853-8847

Electronic Patent Application Fee Transmittal	
Application Number:	11088032
Filing Date:	22-Mar-2005
Title of Invention:	MESSAGE RECOGNITION USING SHARED LANGUAGE MODEL
First Named Inventor/Applicant Name:	Edwin A. Suominen
Filer:	Dean M. Munyon/Deena Beasley
Attorney Docket Number:	6257-33703
Filed as Large Entity	

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl issue fee	1501	1	1740	1740
Publ. Fee- early, voluntary, or normal	1504	1	300	300

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**2040**

Electronic Acknowledgement Receipt	
EFS ID:	12838116
Application Number:	11088032
International Application Number:	
Confirmation Number:	6401
Title of Invention:	MESSAGE RECOGNITION USING SHARED LANGUAGE MODEL
First Named Inventor/Applicant Name:	Edwin A. Suominen
Customer Number:	35690
Filer:	Dean M. Munyon/Deena Beasley
Filer Authorized By:	Dean M. Munyon
Attorney Docket Number:	6257-33703
Receipt Date:	22-MAY-2012
Filing Date:	22-MAR-2005
Time Stamp:	16:22:37
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$2040
RAM confirmation Number	3341
Deposit Account	501505
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)	
Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)	
Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	Issue_Fee_Transmittal.pdf	95189 576d4da3cbd456cb5720e2aea0364a0a0d2ac2d0	no	1
Warnings:					
Information:					
2	Miscellaneous Incoming Letter	Reasons_for_Allowance.pdf	65039 7f187f738c4fe1ed15deba3083a8651abcab41f4	no	2
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	31884 63c87f0b5b074f853ce5de8574776de41ee6003b	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	192112		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

35690 7590 02/24/2012

MEYERTONS, HOOD, KIVLIN, KOWERT & GOETZEL, P.C.
P.O. BOX 398
AUSTIN, TX 78767-0398

EXAMINER	
COLUCCI, MICHAEL C	
ART UNIT	PAPER NUMBER
2626	

DATE MAILED: 02/24/2012

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/088,032	03/22/2005	Edwin A. Suominen	6257-33703	6401

TITLE OF INVENTION: MESSAGE RECOGNITION USING SHARED LANGUAGE MODEL

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1740	$300	$0	$2040	05/24/2012

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

35690 7590 02/24/2012

MEYERTONS, HOOD, KIVLIN, KOWERT & GOETZEL, P.C.
P.O. BOX 398
AUSTIN, TX 78767-0398

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/088,032	03/22/2005	Edwin A. Suominen	6257-33703	6401

TITLE OF INVENTION: MESSAGE RECOGNITION USING SHARED LANGUAGE MODEL

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1740	$300	$0	$2040	05/24/2012

EXAMINER	ART UNIT	CLASS-SUBCLASS
COLUCCI, MICHAEL C	2626	704-009000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:

❑ Issue Fee

❑ Publication Fee (No small entity discount permitted)

❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)

❑ A check is enclosed.

❑ Payment by credit card. Form PTO-2038 is attached.

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

❑ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

❑ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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.

UNITED STATES PATENT AND TRADEMARK OFFICE

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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/088,032	03/22/2005	Edwin A. Suominen	6257-33703	6401

35690 7590 02/24/2012

MEYERTONS, HOOD, KIVLIN, KOWERT & GOETZEL, P.C.
P.O. BOX 398
AUSTIN, TX 78767-0398

EXAMINER	
COLUCCI, MICHAEL C	
ART UNIT	PAPER NUMBER
2626	

DATE MAILED: 02/24/2012

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 704 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 704 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No.	Applicant(s)	
	11/088,032	SUOMINEN, EDWIN A.	
	Examiner	Art Unit	
	MICHAEL COLUCCI	2626	

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

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *12/23/2011*.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are *81-83,85-93 and 103-110*.

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

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

/MICHAEL COLUCCI/
Primary Examiner, Art Unit 2626

DETAILED ACTION

Allowable Subject Matter

1. Claims 81-83, 85-93, and 103-110 are allowed.

2. The following is an examiner's statement of reasons for allowance:

After careful review of the amended claims, Examiner believes that the prior art taken alone or in combination fails to teach the complex claim limitations.

All claims were considered in light of the specification and are believed to overcome the current references used for rejection, particularly the closest:

A)	US 6285785 B1	Bellegarda et al.	20010904
B)	US 6363348 B1	Besling et al.	20020326
C)	US 6853850 B2	Shim et al.	20050208
D)	US 6307956 B1	Black	20011023
E)	US 6167376 A	Ditzik	20001226
F)	US 5839106 A	Bellegarda	19981117

Independent claims 81, 103, 109, and 110 are allowed because the prior art taken in any combination teaches at best the use of a speech language model, handwriting language model, speech Markov word model (HMM), handwriting Markov word model (HMM), and an additional language model. The prior art fails to teach an adjusted

language model. A) is the closest reference and at best teaches a user training a model, wherein an output message is generated. There is no user message model present in A). B) however teaches adapting a single type language model based on which model a user selects. Assuming arguendo that

1) A)'s training is considered adjusting a model

2) B)'s adaptation of a single user selected model is equivalent to a user message model

3) the group of HMM's and speech & handwriting language models are together part of a larger model e.g. local message model that somehow utilize a separate user message model…

combining B) with A) would not be obvious to one of ordinary skill in the art. For instance, there is no user model that exists independent of the language models and HMM's in A), therefore adding a user model as a means for at least training in A) would destroy the inventive concept of A) since the training and building of models is dependent on direct input and not any type of model , let alone a user message model. Therefore any combination of A)-F) instead teaches at best teaches trained recognition of speech and handwriting using a speech language model, and a handwriting language model, wherein a user can select which model he or she would like to specifically train based on his or her interests without storing or even training a seperate user message model (i.e. a user model is shared by multiple users). A users input selects only a single model that is best for him or her trained previously.

When searching for additional prior art for the limitation as recited in claim 81, 103, 109, and 110 the most relevant topics pertained to material from the same Inventor and Assignee but did not teach or suggest the aforementioned limitation of claims 81, 103, 109, and 110. Further, all claims dependent on claims 81, 103, 109, and 110 are allowed because they further limit their respective parent claims.

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."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael C. Colucci whose telephone number is (571)-270-1847. The examiner can normally be reached on 9:30 am - 6:00 pm, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571)-272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MICHAEL COLUCCI/

Primary Examiner, Art Unit 2626

(571)-270-1847
Examiner FAX: (571)-270-2847
Michael.Colucci@uspto.gov

Notice of References Cited	Application/Control No. 11/088,032	Applicant(s)/Patent Under Reexamination SUOMINEN, EDWIN A.	
	Examiner MICHAEL COLUCCI	Art Unit 2626	Page 1 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-4,969,180 A	11-1990	Watterson et al.	379/56.1
*	B	US-5,313,557 A	05-1994	Osterhout, Ralph	704/272
*	C	US-5,396,443 A	03-1995	Mese et al.	713/321
*	D	US-5,550,930 A	08-1996	Berman et al.	382/187
*	E	US-5,642,522 A	06-1997	Zaenen et al.	715/246
*	F	US-5,680,511 A	10-1997	Baker et al.	704/257
*	G	US-5,737,490 A	04-1998	Austin et al.	704/256
*	H	US-5,839,106 A	11-1998	Bellegarda, Jerome R.	704/257
*	I	US-5,841,901 A	11-1998	Arai et al.	382/187
*	J	US-6,122,614 A	09-2000	Kahn et al.	704/235
*	K	US-6,154,722 A	11-2000	Bellegarda, Jerome R.	704/257
*	L	US-6,167,376 A	12-2000	Ditzik, Richard Joseph	704/235
*	M	US-6,173,259 B1	01-2001	Bijl et al.	704/235

FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

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

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

Notice of References Cited	Application/Control No. 11/088,032	Applicant(s)/Patent Under Reexamination SUOMINEN, EDWIN A.	
	Examiner MICHAEL COLUCCI	Art Unit 2626	Page 2 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,285,785 B1	09-2001	Bellegarda et al.	382/187
*	B	US-6,307,956 B1	10-2001	Black, Gerald R.	382/124
*	C	US-6,363,348 B1	03-2002	Besling et al.	704/270.1
*	D	US-6,430,551 B1	08-2002	Thelen et al.	1/1
*	E	US-2002/0158599 A1	10-2002	Fujita et al.	318/568.11
*	F	US-6,853,850 B2	02-2005	Shim et al.	455/550.1
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

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

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

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L29	2	26 and handwriting and asr and (user near5 model)	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2012/02/17 16:34
L28	12	26 and handwriting and asr	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2012/02/17 16:34
L27	982	26 and handwriting	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2012/02/17 16:34
L26	23838	((704/257) or (704/256) or (704/235) or (455/550.1) or (382/187) or (382/124) or (379/56.1) or (318/568.11) or (1/1)).CCLS.	USPAT; USOCR	OR	OFF	2012/02/17 16:34
L25	1	21 and (language same adapt$6) and (user$2 with adapt$4)	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2012/02/17 15:30
L24	1	21 and (language same adapt$6) and (user$2 with model$2)	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2012/02/17 15:26
L23	1	21 and (language same adapt$6)	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2012/02/17 15:23
L22	1	21 and (language same adapt$4)	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2012/02/17 15:23
L21	1	(US-6363348-$).did.	USPAT	OR	OFF	2012/02/17 15:23
L20	1	14 and (markov same (stroke$2)) and (markov with phoneme$3)	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2012/02/17 15:06
L19	1	14 and (markov same (stroke$2)) and (markov with (speech acoustic phoneme$3))	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2012/02/17 15:06
L18	0	14 and (markov with (stroke$2)) and (markov with (speech acoustic phoneme$3))	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2012/02/17 15:06
L17	1	14 and (markov with (handwriting stroke$2)) and (markov with (speech	US-PGPUB;	OR	OFF	2012/02/17 15:05

		acoustic phoneme$3))	USPAT; EPO; JPO			
L16	1	14 and (markov with (handwriting stroke)) and (markov with (speech acoustic phoneme$3))	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2012/02/17 15:05
L15	1	14 and (markov with handwriting)	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2012/02/17 15:04
L14	1	(US-6285785-$).did.	USPAT	OR	OFF	2012/02/17 15:03
L13	6	12 and 9	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2012/02/17 14:44
L12	43	language same acoustic same hand$2writing same model$3	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2012/02/17 14:44
L11	0	7 and 9	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2012/02/17 14:43
L10	0	8 and 9	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2012/02/17 14:43
L9	10274961	@ad<="19990717"	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2012/02/17 14:43
L8	12	language with acoustic with hand$2writing with model$3	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2012/02/17 14:43
L7	18	language with acoustic with hand$2writing	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2012/02/17 14:43

2/17/2012 4:35:00 PM
C:\East\Workspaces\11088032.wsp

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11088032	SUOMINEN, EDWIN A.
	Examiner	**Art Unit**
	Colucci, Michael C	2626

SEARCHED			
Class	**Subclass**	**Date**	**Examiner**
382	187	11/5/2007	MC
704	256, 270	11/5/2007	MC
704	235, 257	6/4/2008	MC
379	56.1	6/4/2008	MC
382	124, 187	6/4/2008	MC
455	550.1	6/4/2008	MC
704	257	4/16/2009	MC
382	187	10/20/2009	MC
704	235	11/12/2010	MC
704	270.1	9/19/2011	MC
704	257, 256, 235	2/17/2012	MC
455	550.1	2/17/2012	MC
382	187, 124	2/17/2012	MC
379	56.1	2/17/2012	MC
318	568.11	2/17/2012	MC

SEARCH NOTES		
Search Notes	**Date**	**Examiner**
Searched 382/187 with keyword limitations	11/5/2007	MC
Searched 704/256 with keyword limitations	11/5/2007	MC
Searched 704/270 with keyword limitations	11/5/2007	MC
Consulted SPE Richemond Dorvil	11/5/2007	MC
Searched 704/235 with keyword limitations	6/4/2008	MC
Searched 704/257 with keyword limitations	6/4/2008	MC
Searched 379/56.1 with keyword limitations	6/4/2008	MC
Searched 382/124 with keyword limitations	6/4/2008	MC
Searched 455/550.1 with keyword limitations	6/4/2008	MC
Searched 382/187 with keyword limitations	6/4/2008	MC
Performed a double patenting search	5/27/2008	MC
Performed an inventors search	5/27/2008	MC
Consulted SPE Richemond Dorvil	5/27/2008	MC
Consulted Primary Examiner Talivaldis Smits	5/27/2008	MC
Checked the spec. for "medium" - not a signal	11/7/2008	MC
Searched 704/257 with keyword limitations	4/16/2009	MC
Searched 382/187 with keyword limitations	10/20/2009	MC

SEARCH NOTES

Search Notes	Date	Examiner
Searched 704/235 with keyword limitations	11/12/2010	MC
rechecked CRM claims - ok - magnetic medium [0016]	11/12/2010	MC
checked system claims - ok - computer memory and stylus tablet	11/12/2010	MC
checked method claims - ok - computer memory on device	11/12/2010	MC
checked apparatus claims - ok - computer memory within apparatus	11/12/2010	MC
checked new method, apparatus, and system claims - ok, tablet is physical hardware which contains additional hardware or software. The present invention itself is not implemented as software. further "a device" is explicilty mentioned using a microphone and stylus input. Can not be performed mentally either, since there is a physical signal input into a microphone and a stylus is digital. In other words, it is not a field of use to use results from both ASR and handwriting together	4/13/2011	MC
checked CRM - ok tangible non-transitory	4/13/2011	MC
Searched 704/270.1 with keyword limitations	9/19/2011	MC
searched 704/257, 256, 235 with keyword limitations	2/17/2012	MC
searched 455/550.1 with keyword limitations	2/17/2012	MC
searched 382/187, 124 with keyword limitations	2/17/2012	MC
searched 379/56.1 with keyword limitations	2/17/2012	MC
searched 318/568.11 with keyword limitations	2/17/2012	MC
searched IEEE	2/17/2012	MC
searched Google Scholar	2/17/2012	MC
searched ACM	2/17/2012	MC
searched ASE	2/17/2012	MC
searched Bellagarda NPL	2/17/2012	MC

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner
704	257, 256, 235	2/17/2012	MC
455	550.1	2/17/2012	MC
382	187, 124	2/17/2012	MC
379	56.1	2/17/2012	MC
318	568.1	2/17/2012	MC

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11088032	SUOMINEN, EDWIN A.
	Examiner	**Art Unit**
	MICHAEL COLUCCI	2626

ORIGINAL		INTERNATIONAL CLASSIFICATION										
CLASS	SUBCLASS	CLAIMED					NON-CLAIMED					
704	9	G	0	6	F	17 / 27 (2006.01.01)						

CROSS REFERENCE(S)

CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
704	257	256	235		
455	550.1				
382	187	124			
379	56.1				
318	568.11				

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	81		97												
2	82		98												
3	83		99												
	84		100												
4	85		101												
5	86		102												
6	87	13	103												
7	88	14	104												
8	89	15	105												
9	90	16	106												
10	91	17	107												
11	92	18	108												
12	93	19	109												
	94	20	110												
	95														
	96														

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	20	
/MICHAEL COLUCCI/ Primary Examiner.Art Unit 2626	02/17/2012	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	81	3b

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor:	Edwin A. Suominen	Atty.Dkt.No.:	6257-33703
Serial Number:	11/088,032	Examiner:	Colucci, Michael C.
Filing Date:	March 22, 2005	Group/Art Unit:	2626
Title:	MESSAGE RECOGNITION USING SHARED LANGUAGE MODEL	Conf. No.	6401

******CERTIFICATE OF E-FILING TRANSMISSION******

I hereby certify that this correspondence is being transmitted via electronic filing to the United States Patent and Trademark Office on the date shown below:

On: December 23, 2011 /Eric B. Min/
Date Eric B. Min, # 54,761

RESPONSE TO OFFICE ACTION MAILED SEPTEMBER 26, 2011

This paper is submitted in response to an Office Action of September 26, 2011, to further highlight why the application is in condition for allowance.

Please amend the case as listed below.

IN THE CLAIMS:

The following is a current listing of claims and will replace all prior versions and listings of claims in the application. Please amend the claims as follows:

1-80. (Canceled)

81. (Currently Amended) A system for generating text responsive to voice and handwriting input, comprising:

a tablet surface, wherein the system is configured to receive freehand input based at least in part on manipulation of a stylus relative to the tablet surface; and

a microphone for receiving voice input;

wherein the system is configured to:

select a particular user message model from a plurality of user message models;

adjust a language model of a local message model based at least in part on the particular user message model, wherein the local message model includes the language model, a handwriting model, and an acoustic model;

generate text data based at least in part on the freehand input, the adjusted language model, and [[on a]] the handwriting model ~~of the adjusted local message model~~; and

generate text data based at least in part on the voice input, the adjusted language model, and [[on an]] the acoustic model ~~of the adjusted local message model~~.

82. (Previously Presented) The system of claim 81, wherein the system is further configured to:

identify information relating to a particular user;

wherein the particular user message model is selected based at least in part on the information relating to the particular user; and.

wherein the plurality of user message models includes two or more user message models corresponding to users that are different from the particular user.

83. (Previously Presented) The system of claim 82 wherein the microphone is housed in the stylus.

84. (Canceled)

85. (Currently Amended) The system of claim 81, wherein the system is further configured to train the particular user message model by updating the acoustic model.

86. (Previously Presented) The system of claim 81, further comprising a proximity sensor configured to sense a proximity of a user to the microphone.

87. (Previously Presented) The system of claim 81, further comprising an identification circuit configured to identify an owner of the stylus, wherein the system is configured to select the particular user message model at least in part in response to the identification circuit.

88. (Previously Presented) The system of claim 81, wherein the system is configured to select the particular user message model based at least in part on an identifying signal received from the microphone.

89. (Previously Presented) The system of claim 88, wherein the system is configured to access the particular user message model via a wide area network.

90. (Currently Amended) The system of claim 81, wherein the system adjusting the language model includes adjusting ~~system is configure to adjust text data generated from the acoustic model based at least in part on~~ a syntactic model and a semantic model included in the language model ~~particular user message model~~.

91. (Currently Amended) The system of claim 90, wherein the semantic model comprises at least one semantic cluster selected from the group consisting of:

a semantic cluster of a first type that is a mathematically derived group of vectors representing text segments;

a semantic cluster of a second type that is a discrete grouping of text having a particular context; and

a semantic cluster of a third type that is defined with respect to an individual reference word that is indicative of a particular context.

92. (Previously Presented) The system of claim 81, further comprising an activation circuit configured to sense movement of the stylus toward the tablet surface, wherein the system is further configured to receive the freehand input in response to the activation circuit sensing the movement.

93. (Previously Presented) The system of claim 81, wherein the particular user message model includes user-specific acoustic model information and user-specific handwriting model information.

94-102. (Canceled)

103. (Currently Amended) A method, comprising:

receiving, at a device, freehand input based at least in part on manipulation of a stylus;

receiving, at the device, audio input based at least in part on information received at a microphone;

selecting, via the device, a selected user message model from a plurality of user message models;

adjusting, via the device, a language model of a local message model, wherein the local message model ~~that~~ includes the language model, a handwriting model, and an acoustic model, wherein the adjusting the ~~local message model~~ language model is based at least in part on the selected user message model;

generating, by the device, converted handwriting text data based at least in part on the freehand input, the adjusted language model, and [[on]] the handwriting model ~~of the adjusted local message model~~; and

generating, by the device, converted speech text data based at least in part on the audio input, the adjusted language model, and [[on]] the acoustic model ~~of the adjusted local message model~~.

104. (Previously Presented) The method according to claim 103, further comprising switching from receiving audio input to receiving freehand input in response to detecting movement of the stylus towards a tablet.

105. (Previously Presented) The method according to claim 103, further comprising accessing the selected user message model via a network.

106. (Previously Presented) The method according to claim 103, further comprising training the selected user message model.

107. (Currently Amended) The method according to claim 103, further comprising training the local message model by adjusting the acoustic model of the local message model and leaving the language model of the local message model unchanged.

108. (Currently Amended) The method according to claim 103, further comprising training the local message model by adjusting the handwriting model of the local message model and leaving the language model of the local message model unchanged.

109. (Currently Amended) An article of manufacture including a ~~tangible~~ non-transitory computer-readable medium having stored thereon instructions executable by a computing device to cause the computing device to perform operations comprising:

receiving freehand input based at least in part on manipulation of a stylus;

receiving audio input based at least in part on information received at a microphone;

selecting a particular user message model from a plurality of user message models;

adjusting a language model of a local message model based at least in part on the particular user message model, the local message model including the language model, a handwriting model and an acoustic model;

generating converted handwriting text data based at least in part on the freehand input, on the adjusted language model, and on the handwriting model ~~of the adjusted local message model~~; and

generating converted speech text data based at least in part on the audio input, on the adjusted language model, and on the acoustic model ~~of the adjusted local message model~~.

110. (Currently Amended) An apparatus, comprising:

means for receiving freehand input based at least in part on manipulation of a stylus;

means for receiving audio input based at least in part on audio information;

means for selecting a particular user message model from a plurality of user message models;

means for adjusting a language model of a local message model based at least in part on the particular user message model, the local message model including the language model, a handwriting model, and an acoustic model;

means for generating converted handwriting text data based at least in part on the freehand input, on the adjusted language model, and on the handwriting model ~~of the adjusted local message model~~; and

means for generating converted speech text data based at least in part on the audio input, on the adjusted language model, and on the acoustic model ~~of the adjusted local message model~~.

REMARKS:

Claims 81-83, 85-93, and 103-110 were pending in the application at the time of the Office Action. No claims are added or canceled herein. Claims 81, 85, 90, 91, 103, and 107-110 are amended. Therefore, claims 81-83, 85-93, and 103-110 remain pending in this application.

Art-Based Rejections

All pending claims stand rejected under 35 U.S.C. § 103 as being unpatentable over various combinations of Bellegarda '785, Besling (U.S. Patent No. 6,285,785), Shim (U.S. Patent No. 6853850), Black (U.S. Patent No. 6,307,956), Ditzik (U.S. Patent No. 6,167,376), and Bellegarda '106 (U.S. Patent No. 5,839,106). Applicant respectfully disagrees with the rejections. However, amendments are presented herein in an effort to bring the claims to issue more rapidly.

For example, claim 81 as amended herein recites in part:

> adjust a ***language model*** of a local message model based at least in part on the particular user message model, wherein the local message model includes the language model, a handwriting model, and an acoustic model;
>
> generate text data based at least in part on the freehand input, the ***adjusted language model***, and the handwriting model; and
>
> generate text data based at least in part on the voice input, the ***adjusted language model***, and the acoustic model.

As discussed in detail below, these "adjusted language model" related features are not taught or suggested by the cited references.

The Bellegarda '785 reference is directed to "method and apparatus that employs an integrated use of speech and handwriting recognition to improve an overall accuracy, in terms of throughput, of an automatic recognizer." Bellegarda '785 at col. 3, lines 54-57. As the Office Action correctly acknowledges, Bellegarda '785 "fails to teach selecting a particular user message model from a plurality of user message models" and "adjusting a local message model based at least in part on the particular user message model, wherein the local message model includes a handwriting model and an acoustic model," as was recited in the previously-pending

version of claim 81. Applicant submits that Bellegarda '785 similarly fails to teach or suggest the "adjusted language model" related features recited in amended claim 81. For example, Bellegarda '785 fails to teach or suggest "adjust[ing] a language model" and "generat[ing] text data based at least in part on the freehand input, the adjusted language model, and the handwriting model" and further "generat[ing] text data based at least in part on the voice input, the adjusted language model, and the acoustic model."

The Besling reference fails to cure the deficiencies of Bellegarda '785. Besling is cited in the Office Action as teaching a "plurality of recognition models of a same type is performed by a basic recognition model and a plurality of profiles." Office Action at 5. However, absent from Besling's discussion of use of "different recognition models of a same type" is any teaching or suggestion of the above-discussed "adjusted language model" related features that are recited in amended claim 81. The Office Action does not contend otherwise. For example, Besling failst to teach or suggest "adjust[ing] a language model" and "generat[ing] text data based at least in part on the freehand input, the adjusted language model, and the handwriting model" and further "generat[ing] text data based at least in part on the voice input, the adjusted language model, and the acoustic model."

The other cited references fail to cure the deficiencies of Bellagara '785 and Belsing. For example, the Shim reference is directed to a "[m]ethod and system for controlling operation of radiotelephone speaker volume and/or microphone gain." Shim at Abstract. The Office Action relies on Shim in the rejection of dependent claims as allegedly teaching "a proximity sensor configured to sense a proximity of a user to the microphone." Office Action at 35. The Black reference is directed to an "identity verification system [that] employs biometric technology for identity verification." Black at Abstract. Black is cited in the rejection of dependent claims as allegedly teaching "an identification circuit configured to identify an owner of [] the stylus, wherein the system is configured to select the selected message model at least in part in response to the identification circuit." Office Action at 39. Ditzik is directed to "[a] computer system with speech recognition systems and handwriting recognition systems . . . that work closely together to improve the total recognition accuracy of each system alone." The Office Action relies on Ditzik as allegedly teaching "a system that uses ASR and AHR to correct user errors, which can be implemented via telephone, internet computer, etc. wherein a tablet can have internet connections such as a laptop having the screen" in the rejection of dependent claims.

Office Action at 42. Bellegarda '106 is directed to "[m]ethods and apparatus for performing large-vocabulary speech recognition employing an integrated syntactic and semantic statistical language model." Bellegarda '106 at Abstract. In rejecting dependent claims, the Office Action cites the Bellegarda '106 reference as allegedly teaching "use [of] an n-gram syntactic-type first model 310 to produce a list of candidate text messages from a sequence of feature vectors." Office Action at 46. Applicant submits that these references, taken alone or in combination, fail to teach or suggest the above-discussed "adjusted language model" related features that are recited in amended claim 81. The Office Action does not contend otherwise.

For at least the reasons discussed above, the cited references do not teach, or suggest all of the features recited in amended independent claim 81. Thus, a *prima facie* of case of obviousness cannot be established with respect to independent claim 81 or the claims that depend therefrom. Similar remarks also apply to amended independent claims 103, 109, and 110, as well as the claims that depend therefrom, although these claims have different scope than claim 81.

CONCLUSION:

Applicant respectfully submits the application is in condition for allowance, and an early notice to that effect is requested.

If any extension of time (under 37 C.F.R. § 1.136) is necessary to prevent the above-referenced application from becoming abandoned, Applicant hereby petitions for such extension.

The Commissioner is authorized to charge any fees that may be required, or credit any overpayment, to Meyertons, Hood, Kivlin, Kowert & Goetzel, P.C. Deposit Account No. 501505/6257-33703/EBM.

Respectfully submitted,

Date: December 23, 2011

By: /Eric B. Min/
Eric B. Min
Reg. No. 54,761
Attorney for Applicant

Meyertons, Hood, Kivlin, Kowert & Goetzel, P.C.
P.O. Box 398
Austin, TX 78767-0398
(512) 853-8862

Electronic Acknowledgement Receipt	
EFS ID:	11703813
Application Number:	11088032
International Application Number:	
Confirmation Number:	6401
Title of Invention:	Message recognition using shared language model
First Named Inventor/Applicant Name:	Edwin A. Suominen
Customer Number:	35690
Filer:	Eric B. Min/Deena Beasley
Filer Authorized By:	Eric B. Min
Attorney Docket Number:	6257-33703
Receipt Date:	23-DEC-2011
Filing Date:	22-MAR-2005
Time Stamp:	17:10:00
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Response_to_OA_09_26_11.pdf	109033 2cd39ef24543e36ab1ff0f87c401ac1514189019	yes	11

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	7
	Applicant Arguments/Remarks Made in an Amendment	8	11
Warnings:			
Information:			
	Total Files Size (in bytes):	109033	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 11/088,032	Filing Date 03/22/2005	☐ To be Mailed

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☐		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

		(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
AMENDMENT	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1)		(Column 2)	(Column 3)					
	12/23/2011	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
AMENDMENT	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0	X $ =		OR	X $60 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0	X $ =		OR	X $250 =	0
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	**0**

* 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.

Legal Instrument Examiner:
/C. Dessau/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/088,032	03/22/2005	Edwin A. Suominen	6257-33703	6401

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MEYERTONS, HOOD, KIVLIN, KOWERT & GOETZEL, P.C.
P.O. BOX 398
AUSTIN, TX 78767-0398

EXAMINER	
COLUCCI, MICHAEL C	
ART UNIT	PAPER NUMBER
2626	

NOTIFICATION DATE	DELIVERY MODE
09/26/2011	ELECTRONIC

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

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patent_docketing@intprop.com
ptomhkkg@gmail.com

Office Action Summary	Application No.	Applicant(s)	
	11/088,032	SUOMINEN, EDWIN A.	
	Examiner	Art Unit	
	MICHAEL COLUCCI	2626	

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 July 2011*.

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

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ 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

5)☒ Claim(s) *81-83,85-93 and 103-110* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *81-83,85-93 and 103-110* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

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

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

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

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

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

Priority under 35 U.S.C. § 119

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

a)☐ All b)☐ Some * c)☐ None of:

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

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

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

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

Attachment(s)

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

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 07/25/2011 has been entered.

Response to Arguments

2. Applicants arguments with respect to claims 81-83, 85, 88, 92, 93, and 103-110 have been considered but are moot in view of the new grounds of rejection. Examiner believes that the current amendment narrows the scope of the claims to user directed training (such as multiple user models from an interface identified), wherein Examiner believes that while Bellegarda teaches a user interface, the current prior art lacks the teaching of a user model. Therefore, Examiner has incorporated Besling et al. US 6363348 B1 (hereinafter Besling) to address the addition of user models to adapt local models. Besling improves the existing language models of Bellegarda by allowing existing models to be updated for particular users, for instance, Besling already teaches existing word models such as that in Bellegarda. Specifically, Besling teaches a plurality of recognition models of a same type is formed by a basic recognition model

and a plurality of adaptation profiles. Preferably, the basic model and the adaptation profiles are stored in a same storage, such as the storage means 314. The selection means 316 *selects a recognition model by selecting at least one of the adaptation profiles in dependence on the model improvement data associated with the user of the user station*. Storing means 318 are used for storing an indication of the selected adaptation profile in association with the user identifier. The retrieving means 320 retrieves a recognition model from the storage means 314 by retrieving an adaptation profile associated with the user identifier and adapting the basic recognition model under control of the adaptation profile (Besling Col 7 lines 45-65). Besling claims a plurality of different user-oriented recognition model sets, each set of a same type; in that the recognition enrolment step comprises selecting a user-oriented recognition model from a set of a same type in dependence on the model improvement data associated with the user; and storing an indication of the selected user-oriented recognition model in association with the user identifier; and in that the step of recognizing the input pattern comprises retrieving a user-oriented recognition model associated with the user identifier transferred to the server station and incorporating the retrieved user-oriented recognition model in the model collection (e.g. Besling Claim 1 with Fig. 3 user stations).

Further, Besling analogously teaches well known uses of word language models with respect to HMM and statistic speech and handwriting models, wherein speech and handwriting recognition models can be applied for matching various input patterns (Besling Col. 2 line 27 – Col. 3 line 7). Please see rejection below.

Claim Rejections - 35 USC § 103

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

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 81-83, 85, 88, 92, 93, and 103-110 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bellegarda et al. US 6285785 B1 (Bellegarda) in view of Besling et al. US 6363348 B1 (hereinafter Besling).

Re claim 81, Bellegarda teaches a system for generating text responsive to ~ voice and handwriting input, comprising:

a tablet surface, wherein the system is configured to receive freehand input based at least in part on manipulation of a stylus relative to the tablet surface (Col 12 lines 39-65, tablet surface to accept hand writing).

a microphone for receiving voice input (Fig. 1 element 22 microphone);

wherein the system is configured to:

generate text data based at least in part on the freehand input and on a handwriting model of the adjusted local message model (Col. 12 lines 5-38 hand writing converted to text compatible with keyboard or word processing system for instance, well known for AHR)

generate text data based at least in part on the voice input and on an acoustic model of the adjusted local message model (Col 12 lines 39-65, handwriting input, ASR and AHR used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model)

While Bellegarda teaches training handwriting and acoustic models, Bellegarda fails to teach selecting a particular user message model from a plurality of user message models;

adjusting a local message model based at least in part on the particular user message model, wherein the local message model includes a handwriting model and an acoustic model;

Besling improves the existing language models of Bellegarda by allowing existing models to be updated for particular users, for instance, Besling already teaches existing word models such as that in Bellegarda. Specifically, Besling teaches a plurality of recognition models of a same type is formed by a basic recognition model and a plurality of adaptation profiles. Preferably, the basic model and the adaptation profiles are stored in a same storage, such as the storage means 314. The selection means 316 *selects a recognition model by selecting at least one of the adaptation profiles in dependence on the model improvement data associated with the user of the user station*. Storing means 318 are used for storing an indication of the selected adaptation profile in association with the user identifier. The retrieving means 320 retrieves a recognition model from the storage means 314 by retrieving an adaptation profile

associated with the user identifier and adapting the basic recognition model under control of the adaptation profile (Besling Col 7 lines 45-65). Besling claims a plurality of different user-oriented recognition model sets, each set of a same type; in that the recognition enrolment step comprises selecting a user-oriented recognition model from a set of a same type in dependence on the model improvement data associated with the user; and storing an indication of the selected user-oriented recognition model in association with the user identifier; and in that the step of recognizing the input pattern comprises retrieving a user-oriented recognition model associated with the user identifier transferred to the server station and incorporating the retrieved user-oriented recognition model in the model collection (e.g. Besling Claim 1 with Fig. 3 user stations).

Further, Besling analogously teaches well known uses of word language models with respect to HMM and statistic speech and handwriting models, wherein speech and handwriting recognition models can be applied for matching various input patterns (Besling Col. 2 line 27 – Col. 3 line 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Bellegarda to incorporate selecting a particular user message model from a plurality of user message models;

adjusting a local message model based at least in part on the particular user message model, wherein the local message model includes a handwriting model and an acoustic model as taught by Besling to allow for improvement of basic trained statistical language data, by retrieving a user-oriented recognition model associated with a user identifier transferred to a server and incorporating the retrieved user-oriented

recognition model in a model collection and retrieving a user-oriented recognition model associated with the user identifier transferred to the server and incorporating the retrieved user-oriented recognition model in the model collection (e.g. Besling Claim 1 with Fig. 3 user stations), where Besling can handle various patterns (i.e. handwriting and acoustic) (Besling Col. 2 line 27 – Col. 3 line 7), wherein the existing microphone & handwriting tablet/stylus as well as handwriting and speech models of Bellegarda are improved by Besling to have a collection updated based on multiple users utilizing tablets,stylus,microphones/etc. at multiple stations, wherein the user identification data via user-oriented models can be used to adapt the existing trained models with user *and/or* pre-existing training data (Besling Col 7 lines 45-65).

It would have also been obvious to one of ordinary skill in the art to apply a known technique of Besling acoustic/handwriting language user-model training to the known method of Bellegarda's acoustic/handwriting language model training with an existing user interface, wherein the teaching a of Bellegarda and Besling are analogous combinations that *now* include the incorporation of user-models as part of training for an explicitly improved and adapted set of already present system models (as in Bellegarda).

Re claim 82, While Bellegarda teaches training handwriting and acoustic models, Bellegarda fails to teach the system of claim 81, wherein the system is further configured to:

identify information relating to a particular user;

wherein the particular user message model is selected based at least in part on the information relating to the particular user; and

wherein the plurality of user message models includes two or more user message models corresponding to users that are different from the particular user

Besling improves the existing language models of Bellegarda by allowing existing models to be updated for particular users, for instance, Besling already teaches existing word models such as that in Bellegarda. Specifically, Besling teaches a plurality of recognition models of a same type is formed by a basic recognition model and a plurality of adaptation profiles. Preferably, the basic model and the adaptation profiles are stored in a same storage, such as the storage means 314. The selection means 316 *selects a recognition model by selecting at least one of the adaptation profiles in dependence on the model improvement data associated with the user of the user station*. Storing means 318 are used for storing an indication of the selected adaptation profile in association with the user identifier. The retrieving means 320 retrieves a recognition model from the storage means 314 by retrieving an adaptation profile associated with the user identifier and adapting the basic recognition model under control of the adaptation profile (Besling Col 7 lines 45-65). Besling claims a plurality of different user-oriented recognition model sets, each set of a same type; in that the

recognition enrolment step comprises selecting a user-oriented recognition model from a set of a same type in dependence on the model improvement data associated with the user; and storing an indication of the selected user-oriented recognition model in association with the user identifier; and in that the step of recognizing the input pattern comprises retrieving a user-oriented recognition model associated with the user identifier transferred to the server station and incorporating the retrieved user-oriented recognition model in the model collection (e.g. Besling Claim 1 with Fig. 3 user stations).

Further, Besling analogously teaches well known uses of word language models with respect to HMM and statistic speech and handwriting models, wherein speech and handwriting recognition models can be applied for matching various input patterns (Besling Col. 2 line 27 – Col. 3 line 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Bellegarda to incorporate identify information relating to a particular user;

wherein the particular user message model is selected based at least in part on the information relating to the particular user; and

wherein the plurality of user message models includes two or more user message models corresponding to users that are different from the particular user

as taught by Besling to allow for improvement of basic trained statistical language data, by retrieving a user-oriented recognition model associated with a user identifier transferred to a server and incorporating the retrieved user-oriented recognition model in a model collection and retrieving a user-oriented recognition model

associated with the user identifier transferred to the server and incorporating the retrieved user-oriented recognition model in the model collection (e.g. Besling Claim 1 with Fig. 3 user stations), where Besling can handle various patterns (i.e. handwriting and acoustic) (Besling Col. 2 line 27 – Col. 3 line 7), wherein the existing microphone & handwriting tablet/stylus as well as handwriting and speech models of Bellegarda are improved by Besling to have a collection updated based on multiple users utilizing tablets,stylus,microphones/etc. at multiple stations, wherein the user identification data via user-oriented models can be used to adapt the existing trained models with user *and/or* pre-existing training data (Besling Col 7 lines 45-65).

It would have also been obvious to one of ordinary skill in the art to apply a known technique of Besling acoustic/handwriting language user-model training to the known method of Bellegarda's acoustic/handwriting language model training with an existing user interface, wherein the teaching a of Bellegarda and Besling are analogous combinations that *now* include the incorporation of user-models as part of training for an explicitly improved and adapted set of already present system models (as in Bellegarda).

Re claim 83, Bellegarda teaches the system of claim 82 wherein the microphone is housed in the stylus (Col 12 lines 39-65, tablet surface to accept hand writing, stylus element 20 in Fig. 1).

Re claim 85, While Bellegarda teaches training handwriting and acoustic models, Bellegarda fails to teach selecting a particular user message model from a plurality of user message models;

adjusting a local message model based at least in part on the particular user message model, wherein the local message model includes a handwriting model and an acoustic model;

Besling improves the existing language models of Bellegarda by allowing existing models to be updated for particular users, for instance, Besling already teaches existing word models such as that in Bellegarda. Specifically, Besling teaches a plurality of recognition models of a same type is formed by a basic recognition model and a plurality of adaptation profiles. Preferably, the basic model and the adaptation profiles are stored in a same storage, such as the storage means 314. The selection means 316 *selects a recognition model by selecting at least one of the adaptation profiles in dependence on the model improvement data associated with the user of the user station*. Storing means 318 are used for storing an indication of the selected adaptation profile in association with the user identifier. The retrieving means 320 retrieves a recognition model from the storage means 314 by retrieving an adaptation profile associated with the user identifier and adapting the basic recognition model under control of the adaptation profile (Besling Col 7 lines 45-65). Besling claims a plurality of different user-oriented recognition model sets, each set of a same type; in that the recognition enrolment step comprises selecting a user-oriented recognition model from a set of a same type in dependence on the model improvement data associated with the

user; and storing an indication of the selected user-oriented recognition model in association with the user identifier; and in that the step of recognizing the input pattern comprises retrieving a user-oriented recognition model associated with the user identifier transferred to the server station and incorporating the retrieved user-oriented recognition model in the model collection (e.g. Besling Claim 1 with Fig. 3 user stations).

Further, Besling analogously teaches well known uses of word language models with respect to HMM and statistic speech and handwriting models, wherein speech and handwriting recognition models can be applied for matching various input patterns (Besling Col. 2 line 27 – Col. 3 line 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Bellegarda to incorporate the system of claim 82 wherein the system is further configured to train the particular user message model as taught by Besling to allow for improvement of basic trained statistical language data, by retrieving a user-oriented recognition model associated with a user identifier transferred to a server and incorporating the retrieved user-oriented recognition model in a model collection and retrieving a user-oriented recognition model associated with the user identifier transferred to the server and incorporating the retrieved user-oriented recognition model in the model collection (e.g. Besling Claim 1 with Fig. 3 user stations), where Besling can handle various patterns (i.e. handwriting and acoustic) (Besling Col. 2 line 27 – Col. 3 line 7), wherein the existing microphone & handwriting tablet/stylus as well as handwriting and speech models of Bellegarda are improved by Besling to have a collection updated based on multiple users utilizing

tablets,stylus,microphones/etc. at multiple stations, wherein the user identification data via user-oriented models can be used to adapt the existing trained models with user *and/or* pre-existing training data (Besling Col 7 lines 45-65).

It would have also been obvious to one of ordinary skill in the art to apply a known technique of Besling acoustic/handwriting language user-model training to the known method of Bellegarda's acoustic/handwriting language model training with an existing user interface, wherein the teaching a of Bellegarda and Besling are analogous combinations that *now* include the incorporation of user-models as part of training for an explicitly improved and adapted set of already present system models (as in Bellegarda).

Re claim 88, While Bellegarda teaches training handwriting and acoustic models (Col 12 lines 39-65, ASR and AHR used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model), Bellegarda fails to teach wherein the system is configured to select the particular user message model based at least in part on an identifying signal received from the microphone Besling improves the existing language models of Bellegarda by allowing existing models to be updated for particular users, for instance, Besling already teaches existing word models such as that in Bellegarda. Specifically, Besling teaches a plurality of recognition models of a same type is formed by a basic recognition model and a plurality of adaptation profiles. Preferably, the basic model and the adaptation profiles are stored

in a same storage, such as the storage means 314. The selection means 316 *selects a recognition model by selecting at least one of the adaptation profiles in dependence on the model improvement data associated with the user of the user station*. Storing means 318 are used for storing an indication of the selected adaptation profile in association with the user identifier. The retrieving means 320 retrieves a recognition model from the storage means 314 by retrieving an adaptation profile associated with the user identifier and adapting the basic recognition model under control of the adaptation profile (Besling Col 7 lines 45-65). Besling claims a plurality of different user-oriented recognition model sets, each set of a same type; in that the recognition enrolment step comprises selecting a user-oriented recognition model from a set of a same type in dependence on the model improvement data associated with the user; and storing an indication of the selected user-oriented recognition model in association with the user identifier; and in that the step of recognizing the input pattern comprises retrieving a user-oriented recognition model associated with the user identifier transferred to the server station and incorporating the retrieved user-oriented recognition model in the model collection (e.g. Besling Claim 1 with Fig. 3 user stations).

Further, Besling analogously teaches well known uses of word language models with respect to HMM and statistic speech and handwriting models, wherein speech and handwriting recognition models can be applied for matching various input patterns (Besling Col. 2 line 27 – Col. 3 line 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Bellegarda to incorporate wherein the

system is configured to select the particular user message model based at least in part on an identifying signal received from the microphone as taught by Besling to allow for improvement of basic trained statistical language data, by retrieving a user-oriented recognition model associated with a user identifier transferred to a server and incorporating the retrieved user-oriented recognition model in a model collection and retrieving a user-oriented recognition model associated with the user identifier transferred to the server and incorporating the retrieved user-oriented recognition model in the model collection (e.g. Besling Claim 1 with Fig. 3 user stations), where Besling can handle various patterns (i.e. handwriting and acoustic) (Besling Col. 2 line 27 – Col. 3 line 7), wherein the existing microphone & handwriting tablet/stylus as well as handwriting and speech models of Bellegarda are improved by Besling to have a collection updated based on multiple users utilizing tablets,stylus,microphones/etc. at multiple stations, wherein the user identification data via user-oriented models can be used to adapt the existing trained models with user *and/or* pre-existing training data (Besling Col 7 lines 45-65).

It would have also been obvious to one of ordinary skill in the art to apply a known technique of Besling acoustic/handwriting language user-model training to the known method of Bellegarda's acoustic/handwriting language model training with an existing user interface, wherein the teaching a of Bellegarda and Besling are analogous combinations that *now* include the incorporation of user-models as part of training for an explicitly improved and adapted set of already present system models (as in Bellegarda).

Re claim 92, Bellegarda teaches the system of claim 81, further comprising an activation circuit configured to sense movement of the stylus toward the tablet surface, wherein the system is further configured to receive the freehand input in response to the activation circuit sensing the movement (Fig 4a, such as pressure when contact is made toward the surface).

Re claim 93, Bellegarda teaches the system of claim 81, wherein the particular message model includes user-specific acoustic model information and user-specific handwriting model information (Col 12 lines 39-65, user editing such as element 12 interface for correction, training, ASR and AHR used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model).

While Bellegarda teaches training handwriting and acoustic models, Bellegarda fails to teach the use of particular user message model to substitute the general model of Bellegarda

Besling improves the existing language models of Bellegarda by allowing existing models to be updated for particular users, for instance, Besling already teaches existing word models such as that in Bellegarda. Specifically, Besling teaches a plurality of recognition models of a same type is formed by a basic recognition model and a plurality of adaptation profiles. Preferably, the basic model and the adaptation profiles are stored in a same storage, such as the storage means 314. The selection means

316 *selects a recognition model by selecting at least one of the adaptation profiles in dependence on the model improvement data associated with the user of the user station*. Storing means 318 are used for storing an indication of the selected adaptation profile in association with the user identifier. The retrieving means 320 retrieves a recognition model from the storage means 314 by retrieving an adaptation profile associated with the user identifier and adapting the basic recognition model under control of the adaptation profile (Besling Col 7 lines 45-65). Besling claims a plurality of different user-oriented recognition model sets, each set of a same type; in that the recognition enrolment step comprises selecting a user-oriented recognition model from a set of a same type in dependence on the model improvement data associated with the user; and storing an indication of the selected user-oriented recognition model in association with the user identifier; and in that the step of recognizing the input pattern comprises retrieving a user-oriented recognition model associated with the user identifier transferred to the server station and incorporating the retrieved user-oriented recognition model in the model collection (e.g. Besling Claim 1 with Fig. 3 user stations).

Further, Besling analogously teaches well known uses of word language models with respect to HMM and statistic speech and handwriting models, wherein speech and handwriting recognition models can be applied for matching various input patterns (Besling Col. 2 line 27 – Col. 3 line 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Bellegarda to incorporate the use of particular user message model as taught by Besling to allow for improvement of basic

trained statistical language data, by retrieving a user-oriented recognition model associated with a user identifier transferred to a server and incorporating the retrieved user-oriented recognition model in a model collection and retrieving a user-oriented recognition model associated with the user identifier transferred to the server and incorporating the retrieved user-oriented recognition model in the model collection (e.g. Besling Claim 1 with Fig. 3 user stations), where Besling can handle various patterns (i.e. handwriting and acoustic) (Besling Col. 2 line 27 – Col. 3 line 7), wherein the existing microphone & handwriting tablet/stylus as well as handwriting and speech models of Bellegarda are improved by Besling to have a collection updated based on multiple users utilizing tablets,stylus,microphones/etc. at multiple stations, wherein the user identification data via user-oriented models can be used to adapt the existing trained models with user *and/or* pre-existing training data (Besling Col 7 lines 45-65).

It would have also been obvious to one of ordinary skill in the art to apply a known technique of Besling acoustic/handwriting language user-model training to the known method of Bellegarda's acoustic/handwriting language model training with an existing user interface, wherein the teaching a of Bellegarda and Besling are analogous combinations that *now* include the incorporation of user-models as part of training for an explicitly improved and adapted set of already present system models (as in Bellegarda).

Re claim 103, Bellegarda teaches a method, comprising:

receiving, at a device, freehand input based at least in part on manipulation of a stylus (Col 12 lines 39-65, tablet surface to accept hand writing element 20 stylus);

receiving, at a device, audio input based at least in part on information received at a microphone (Fig. 1 element 22 microphone);

selecting, via the device, a particular user message model from a plurality of message models (Col. 12 lines 5-38 hand writing converted to text compatible with keyboard or word processing system for instance, well known for AHR);

generating, by the device, converted handwriting text data based at least in part on the freehand input, a handwriting model of the adjusted local message model (Col 12 lines 39-65, handwriting input, ASR and AHR used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model);

generating, by the device, converted speech text data based at least in part on the audio input, an acoustic model, of the adjusted local message model (Col 12 lines 39-65, speech input, ASR and AHR used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model).

While Bellegarda teaches training handwriting and acoustic models, Bellegarda fails to teach

adjusting, via the device, a local message model that includes a handwriting model and an acoustic model, wherein the adjusting the local message model is based at least in part on the selected user message model

Besling improves the existing language models of Bellegarda by allowing existing models to be updated for particular users, for instance, Besling already teaches existing

word models such as that in Bellegarda. Specifically, Besling teaches a plurality of recognition models of a same type is formed by a basic recognition model and a plurality of adaptation profiles. Preferably, the basic model and the adaptation profiles are stored in a same storage, such as the storage means 314. The selection means 316 *selects a recognition model by selecting at least one of the adaptation profiles in dependence on the model improvement data associated with the user of the user station*. Storing means 318 are used for storing an indication of the selected adaptation profile in association with the user identifier. The retrieving means 320 retrieves a recognition model from the storage means 314 by retrieving an adaptation profile associated with the user identifier and adapting the basic recognition model under control of the adaptation profile (Besling Col 7 lines 45-65). Besling claims a plurality of different user-oriented recognition model sets, each set of a same type; in that the recognition enrolment step comprises selecting a user-oriented recognition model from a set of a same type in dependence on the model improvement data associated with the user; and storing an indication of the selected user-oriented recognition model in association with the user identifier; and in that the step of recognizing the input pattern comprises retrieving a user-oriented recognition model associated with the user identifier transferred to the server station and incorporating the retrieved user-oriented recognition model in the model collection (e.g. Besling Claim 1 with Fig. 3 user stations).

Further, Besling analogously teaches well known uses of word language models with respect to HMM and statistic speech and handwriting models, wherein speech and

handwriting recognition models can be applied for matching various input patterns (Besling Col. 2 line 27 – Col. 3 line 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Bellegarda to incorporate adjusting, via the device, a local message model that includes a handwriting model and an acoustic model, wherein the adjusting the local message model is based at least in part on the selected user message model

as taught by Besling to allow for improvement of basic trained statistical language data, by retrieving a user-oriented recognition model associated with a user identifier transferred to a server and incorporating the retrieved user-oriented recognition model in a model collection and retrieving a user-oriented recognition model associated with the user identifier transferred to the server and incorporating the retrieved user-oriented recognition model in the model collection (e.g. Besling Claim 1 with Fig. 3 user stations), where Besling can handle various patterns (i.e. handwriting and acoustic) (Besling Col. 2 line 27 – Col. 3 line 7), wherein the existing microphone & handwriting tablet/stylus as well as handwriting and speech models of Bellegarda are improved by Besling to have a collection updated based on multiple users utilizing tablets,stylus,microphones/etc. at multiple stations, wherein the user identification data via user-oriented models can be used to adapt the existing trained models with user *and/or* pre-existing training data (Besling Col 7 lines 45-65).

It would have also been obvious to one of ordinary skill in the art to apply a known technique of Besling acoustic/handwriting language user-model training to the

known method of Bellegarda's acoustic/handwriting language model training with an existing user interface, wherein the teaching a of Bellegarda and Besling are analogous combinations that *now* include the incorporation of user-models as part of training for an explicitly improved and adapted set of already present system models (as in Bellegarda).

Re claim 104, Bellegarda teaches the method according to claim 103, further comprising switching from receiving audio input to receiving freehand input in response to detecting movement of the stylus towards a tablet (Fig 4a, such as pressure when contact is made toward the surface).

Re claim 105, Bellegarda teaches the method according to claim 103, further comprising accessing at least one of the handwriting model, the acoustic model and the particular user message model via a network (Col 12 lines 39-65, handwriting input, ASR and AHR used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model).

While Bellegarda teaches training handwriting and acoustic models, Bellegarda fails to teach the use of particular user message model to substitute the general model of Bellegarda

Besling improves the existing language models of Bellegarda by allowing existing models to be updated for particular users, for instance, Besling already teaches existing

word models such as that in Bellegarda. Specifically, Besling teaches a plurality of recognition models of a same type is formed by a basic recognition model and a plurality of adaptation profiles. Preferably, the basic model and the adaptation profiles are stored in a same storage, such as the storage means 314. The selection means 316 *selects a recognition model by selecting at least one of the adaptation profiles in dependence on the model improvement data associated with the user of the user station*. Storing means 318 are used for storing an indication of the selected adaptation profile in association with the user identifier. The retrieving means 320 retrieves a recognition model from the storage means 314 by retrieving an adaptation profile associated with the user identifier and adapting the basic recognition model under control of the adaptation profile (Besling Col 7 lines 45-65). Besling claims a plurality of different user-oriented recognition model sets, each set of a same type; in that the recognition enrolment step comprises selecting a user-oriented recognition model from a set of a same type in dependence on the model improvement data associated with the user; and storing an indication of the selected user-oriented recognition model in association with the user identifier; and in that the step of recognizing the input pattern comprises retrieving a user-oriented recognition model associated with the user identifier transferred to the server station and incorporating the retrieved user-oriented recognition model in the model collection (e.g. Besling Claim 1 with Fig. 3 user stations).

Further, Besling analogously teaches well known uses of word language models with respect to HMM and statistic speech and handwriting models, wherein speech and

handwriting recognition models can be applied for matching various input patterns (Besling Col. 2 line 27 – Col. 3 line 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Bellegarda to incorporate the use of particular user message model as taught by Besling to allow for improvement of basic trained statistical language data, by retrieving a user-oriented recognition model associated with a user identifier transferred to a server and incorporating the retrieved user-oriented recognition model in a model collection and retrieving a user-oriented recognition model associated with the user identifier transferred to the server and incorporating the retrieved user-oriented recognition model in the model collection (e.g. Besling Claim 1 with Fig. 3 user stations), where Besling can handle various patterns (i.e. handwriting and acoustic) (Besling Col. 2 line 27 – Col. 3 line 7), wherein the existing microphone & handwriting tablet/stylus as well as handwriting and speech models of Bellegarda are improved by Besling to have a collection updated based on multiple users utilizing tablets,stylus,microphones/etc. at multiple stations, wherein the user identification data via user-oriented models can be used to adapt the existing trained models with user *and/or* pre-existing training data (Besling Col 7 lines 45-65).

It would have also been obvious to one of ordinary skill in the art to apply a known technique of Besling acoustic/handwriting language user-model training to the known method of Bellegarda's acoustic/handwriting language model training with an existing user interface, wherein the teaching a of Bellegarda and Besling are analogous combinations that *now* include the incorporation of user-models as part of training for an

explicitly improved and adapted set of already present system models (as in Bellegarda).

Re claim 106, Bellegarda teaches the method according to claim 103, further comprising training the user message model (Fig. 1 elements 12 fed back into element 28 and 32 for instance to train through hand writing).

While Bellegarda teaches training handwriting and acoustic models, Bellegarda fails to teach the use of particular user message model to substitute the general model of Bellegarda

Besling improves the existing language models of Bellegarda by allowing existing models to be updated for particular users, for instance, Besling already teaches existing word models such as that in Bellegarda. Specifically, Besling teaches a plurality of recognition models of a same type is formed by a basic recognition model and a plurality of adaptation profiles. Preferably, the basic model and the adaptation profiles are stored in a same storage, such as the storage means 314. The selection means 316 *selects a recognition model by selecting at least one of the adaptation profiles in dependence on the model improvement data associated with the user of the user station*. Storing means 318 are used for storing an indication of the selected adaptation profile in association with the user identifier. The retrieving means 320 retrieves a recognition model from the storage means 314 by retrieving an adaptation profile associated with the user identifier and adapting the basic recognition model under control of the adaptation profile (Besling Col 7 lines 45-65). Besling claims a plurality of

different user-oriented recognition model sets, each set of a same type; in that the recognition enrolment step comprises selecting a user-oriented recognition model from a set of a same type in dependence on the model improvement data associated with the user; and storing an indication of the selected user-oriented recognition model in association with the user identifier; and in that the step of recognizing the input pattern comprises retrieving a user-oriented recognition model associated with the user identifier transferred to the server station and incorporating the retrieved user-oriented recognition model in the model collection (e.g. Besling Claim 1 with Fig. 3 user stations).

Further, Besling analogously teaches well known uses of word language models with respect to HMM and statistic speech and handwriting models, wherein speech and handwriting recognition models can be applied for matching various input patterns (Besling Col. 2 line 27 – Col. 3 line 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Bellegarda to incorporate the use of particular user message model as taught by Besling to allow for improvement of basic trained statistical language data, by retrieving a user-oriented recognition model associated with a user identifier transferred to a server and incorporating the retrieved user-oriented recognition model in a model collection and retrieving a user-oriented recognition model associated with the user identifier transferred to the server and incorporating the retrieved user-oriented recognition model in the model collection (e.g. Besling Claim 1 with Fig. 3 user stations), where Besling can handle various patterns (i.e. handwriting and acoustic) (Besling Col. 2 line 27 – Col. 3 line 7), wherein the

existing microphone & handwriting tablet/stylus as well as handwriting and speech models of Bellegarda are improved by Besling to have a collection updated based on multiple users utilizing tablets,stylus,microphones/etc. at multiple stations, wherein the user identification data via user-oriented models can be used to adapt the existing trained models with user *and/or* pre-existing training data (Besling Col 7 lines 45-65).

It would have also been obvious to one of ordinary skill in the art to apply a known technique of Besling acoustic/handwriting language user-model training to the known method of Bellegarda's acoustic/handwriting language model training with an existing user interface, wherein the teaching a of Bellegarda and Besling are analogous combinations that *now* include the incorporation of user-models as part of training for an explicitly improved and adapted set of already present system models (as in Bellegarda).

Re claim 107, Bellegarda teaches the method according to claim 103, further comprising training the acoustic model of the local message model (Fig. 1 element 34, speech model trained through element 12 and 30).

Re claim 108, Bellegarda teaches the method according to claim 103, further comprising training the handwriting model of the local message model (Fig. 1 element 32, handwriting model trained through element 12 and 28)

Re claim 109, Bellegarda teaches an article of manufacture including a tangible non-transitory computer-readable medium having stored thereon instructions executable by a computing device to cause the computing device to perform operations comprising:

receiving freehand input based at least in part on manipulation of a stylus (Col 12 lines 39-65, tablet surface to accept hand writing);

receiving audio input based at least in part on information received at a microphone (Fig. 1 element 22 microphone);

selecting a particular user message model from a plurality of message models (Col 12 lines 39-65, ASR and AHR used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model);

generating converted handwriting text data based at least in part on the freehand input and on a handwriting model of the adjusted local message model (Col 12 lines 39-65, handwriting input, ASR and AHR used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model);

generating converted speech text data based at least in part on the audio input and on an acoustic model of the adjusted local message model (Col 12 lines 39-65, speech input, ASR and AHR used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model); and

While Bellegarda teaches training handwriting and acoustic models, Bellegarda fails to teach

adjusting a local message model based at least in part on the particular user message model, the local message model including a handwriting model and an acoustic model

Besling improves the existing language models of Bellegarda by allowing existing models to be updated for particular users, for instance, Besling already teaches existing word models such as that in Bellegarda. Specifically, Besling teaches a plurality of recognition models of a same type is formed by a basic recognition model and a plurality of adaptation profiles. Preferably, the basic model and the adaptation profiles are stored in a same storage, such as the storage means 314. The selection means 316 *selects a recognition model by selecting at least one of the adaptation profiles in dependence on the model improvement data associated with the user of the user station*. Storing means 318 are used for storing an indication of the selected adaptation profile in association with the user identifier. The retrieving means 320 retrieves a recognition model from the storage means 314 by retrieving an adaptation profile associated with the user identifier and adapting the basic recognition model under control of the adaptation profile (Besling Col 7 lines 45-65). Besling claims a plurality of different user-oriented recognition model sets, each set of a same type; in that the recognition enrolment step comprises selecting a user-oriented recognition model from a set of a same type in dependence on the model improvement data associated with the user; and storing an indication of the selected user-oriented recognition model in association with the user identifier; and in that the step of recognizing the input pattern comprises retrieving a user-oriented recognition model associated with the user

identifier transferred to the server station and incorporating the retrieved user-oriented recognition model in the model collection (e.g. Besling Claim 1 with Fig. 3 user stations).

Further, Besling analogously teaches well known uses of word language models with respect to HMM and statistic speech and handwriting models, wherein speech and handwriting recognition models can be applied for matching various input patterns (Besling Col. 2 line 27 – Col. 3 line 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Bellegarda to incorporate adjusting a local message model based at least in part on the particular user message model, the local message model including a handwriting model and an acoustic model

as taught by Besling to allow for improvement of basic trained statistical language data, by retrieving a user-oriented recognition model associated with a user identifier transferred to a server and incorporating the retrieved user-oriented recognition model in a model collection and retrieving a user-oriented recognition model associated with the user identifier transferred to the server and incorporating the retrieved user-oriented recognition model in the model collection (e.g. Besling Claim 1 with Fig. 3 user stations), where Besling can handle various patterns (i.e. handwriting and acoustic) (Besling Col. 2 line 27 – Col. 3 line 7), wherein the existing microphone & handwriting tablet/stylus as well as handwriting and speech models of Bellegarda are improved by Besling to have a collection updated based on multiple users utilizing tablets,stylus,microphones/etc. at multiple stations, wherein the user identification data

via user-oriented models can be used to adapt the existing trained models with user *and/or* pre-existing training data (Besling Col 7 lines 45-65).

It would have also been obvious to one of ordinary skill in the art to apply a known technique of Besling acoustic/handwriting language user-model training to the known method of Bellegarda's acoustic/handwriting language model training with an existing user interface, wherein the teaching a of Bellegarda and Besling are analogous combinations that *now* include the incorporation of user-models as part of training for an explicitly improved and adapted set of already present system models (as in Bellegarda).

Re claim 110, Bellegarda teaches an apparatus, comprising:

means for receiving freehand input based at least in part on manipulation of a stylus (Col 12 lines 39-65, tablet surface to accept hand writing);

means for receiving audio input based at least in part on audio information (Fig. 1 element 22 microphone); and

means for selecting a particular user message model from a plurality of message models (Col 12 lines 39-65, ASR and AHR used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model);

wherein the apparatus is configured to:

generate converted handwriting text data based at least in part on the freehand input and on the handwriting model of the adjusted local message model (Col 12 lines

39-65, handwriting input, ASR and AHR used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model); and

generate converted speech text data based at least in part on the audio input and on the acoustic model of the adjusted local message model (Col 12 lines 39-65, speech input, ASR and AHR used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model)

While Bellegarda teaches training handwriting and acoustic models, Bellegarda fails to teach adjusting a local message model based at least in part on the particular user message model, the local message model including a handwriting model and an acoustic model

Besling improves the existing language models of Bellegarda by allowing existing models to be updated for particular users, for instance, Besling already teaches existing word models such as that in Bellegarda. Specifically, Besling teaches a plurality of recognition models of a same type is formed by a basic recognition model and a plurality of adaptation profiles. Preferably, the basic model and the adaptation profiles are stored in a same storage, such as the storage means 314. The selection means 316 *selects a recognition model by selecting at least one of the adaptation profiles in dependence on the model improvement data associated with the user of the user station*. Storing means 318 are used for storing an indication of the selected adaptation profile in association with the user identifier. The retrieving means 320 retrieves a recognition model from the storage means 314 by retrieving an adaptation profile associated with the user identifier and adapting the basic recognition model under

control of the adaptation profile (Besling Col 7 lines 45-65). Besling claims a plurality of different user-oriented recognition model sets, each set of a same type; in that the recognition enrolment step comprises selecting a user-oriented recognition model from a set of a same type in dependence on the model improvement data associated with the user; and storing an indication of the selected user-oriented recognition model in association with the user identifier; and in that the step of recognizing the input pattern comprises retrieving a user-oriented recognition model associated with the user identifier transferred to the server station and incorporating the retrieved user-oriented recognition model in the model collection (e.g. Besling Claim 1 with Fig. 3 user stations).

Further, Besling analogously teaches well known uses of word language models with respect to HMM and statistic speech and handwriting models, wherein speech and handwriting recognition models can be applied for matching various input patterns (Besling Col. 2 line 27 – Col. 3 line 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Bellegarda to incorporate adjusting a local message model based at least in part on the particular user message model, the local message model including a handwriting model and an acoustic model as taught by Besling to allow for improvement of basic trained statistical language data, by retrieving a user-oriented recognition model associated with a user identifier transferred to a server and incorporating the retrieved user-oriented recognition model in a model collection and retrieving a user-oriented recognition model associated with the user identifier transferred to the server and incorporating the retrieved user-oriented

recognition model in the model collection (e.g. Besling Claim 1 with Fig. 3 user stations), where Besling can handle various patterns (i.e. handwriting and acoustic) (Besling Col. 2 line 27 – Col. 3 line 7), wherein the existing microphone & handwriting tablet/stylus as well as handwriting and speech models of Bellegarda are improved by Besling to have a collection updated based on multiple users utilizing tablets,stylus,microphones/etc. at multiple stations, wherein the user identification data via user-oriented models can be used to adapt the existing trained models with user *and/or* pre-existing training data (Besling Col 7 lines 45-65).

It would have also been obvious to one of ordinary skill in the art to apply a known technique of Besling acoustic/handwriting language user-model training to the known method of Bellegarda's acoustic/handwriting language model training with an existing user interface, wherein the teaching a of Bellegarda and Besling are analogous combinations that *now* include the incorporation of user-models as part of training for an explicitly improved and adapted set of already present system models (as in Bellegarda).

5. Claims 86 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bellegarda et al. US 6285785 B1 (Bellegarda) in view of Besling and further in view of Shim et al. US 6853850 B2 (hereinafter Shim).

Re claim 86, Bellegarda in view of Besling fails to teach the system of claim 81, further comprising a proximity sensor configured to sense a proximity of a user to the microphone.

Shim teaches adjusting the speaker volume and/or the microphone gain to provide optimum audio signal levels for that situation. If the estimated sensor-head distance is greater than the reference distance, the system (1) adjusts the speaker volume and/or the microphone gain to its maximum signal level and/or (2) notifies the user that the maximum signal level may be inadequate to maintain acceptable audio communication and/or (3) disables the speaker and/or the microphone until the sensor-head distance is no greater than the reference distance or (4) takes no action. More than one proximity zone, each with its own reference distance and/or zone center, can be defined and sensed by the system. The minimum-to-maximum range for speaker volume and/or for microphone gain is adjustable for each user (Shim Col. 1 line 67 – Col. 2 line 22).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Bellegarda in view of Besling to incorporate a proximity sensor configured to sense a proximity of a user to the microphone as taught by Shim to allow for ideal audio levels that can be input into the processor for accurate speech recognition, wherein a minimum and maximum distance from the microphone can be implemented to establish thresholds

6. **Claim 87 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bellegarda et al. US 6285785 B1 (Bellegarda) in view of Besling and further in view of Black US 6307956 B1 (hereinafter Black).**

Re claim 87, Bellegarda in view of Besling fails to teach system of claim 81, further comprising an identification circuit configured to identify an owner of said the stylus, wherein the system is configured to select the particular user message model at least in part in response to the identification circuit.

While Bellegarda teaches training handwriting and acoustic models, Bellegarda fails to teach the use of particular user message model to substitute the general model of Bellegarda

Besling improves the existing language models of Bellegarda by allowing existing models to be updated for particular users, for instance, Besling already teaches existing word models such as that in Bellegarda. Specifically, Besling teaches a plurality of recognition models of a same type is formed by a basic recognition model and a plurality of adaptation profiles. Preferably, the basic model and the adaptation profiles are stored in a same storage, such as the storage means 314. The selection means 316 *selects a recognition model by selecting at least one of the adaptation profiles in dependence on the model improvement data associated with the user of the user station*. Storing means 318 are used for storing an indication of the selected adaptation profile in association with the user identifier. The retrieving means 320 retrieves a recognition model from the storage means 314 by retrieving an adaptation profile

associated with the user identifier and adapting the basic recognition model under control of the adaptation profile (Besling Col 7 lines 45-65). Besling claims a plurality of different user-oriented recognition model sets, each set of a same type; in that the recognition enrolment step comprises selecting a user-oriented recognition model from a set of a same type in dependence on the model improvement data associated with the user; and storing an indication of the selected user-oriented recognition model in association with the user identifier; and in that the step of recognizing the input pattern comprises retrieving a user-oriented recognition model associated with the user identifier transferred to the server station and incorporating the retrieved user-oriented recognition model in the model collection (e.g. Besling Claim 1 with Fig. 3 user stations).

Further, Besling analogously teaches well known uses of word language models with respect to HMM and statistic speech and handwriting models, wherein speech and handwriting recognition models can be applied for matching various input patterns (Besling Col. 2 line 27 – Col. 3 line 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Bellegarda to incorporate the use of particular user message model as taught by Besling to allow for improvement of basic trained statistical language data, by retrieving a user-oriented recognition model associated with a user identifier transferred to a server and incorporating the retrieved user-oriented recognition model in a model collection and retrieving a user-oriented recognition model associated with the user identifier transferred to the server and incorporating the retrieved user-oriented recognition model in the model collection (e.g.

Besling Claim 1 with Fig. 3 user stations), where Besling can handle various patterns (i.e. handwriting and acoustic) (Besling Col. 2 line 27 – Col. 3 line 7), wherein the existing microphone & handwriting tablet/stylus as well as handwriting and speech models of Bellegarda are improved by Besling to have a collection updated based on multiple users utilizing tablets,stylus,microphones/etc. at multiple stations, wherein the user identification data via user-oriented models can be used to adapt the existing trained models with user *and/or* pre-existing training data (Besling Col 7 lines 45-65).

It would have also been obvious to one of ordinary skill in the art to apply a known technique of Besling acoustic/handwriting language user-model training to the known method of Bellegarda's acoustic/handwriting language model training with an existing user interface, wherein the teaching a of Bellegarda and Besling are analogous combinations that *now* include the incorporation of user-models as part of training for an explicitly improved and adapted set of already present system models (as in Bellegarda).

Black teaches a stylus 15 includes one or more sensors 20 that capture biometric properties of the user. The computer (chip) 40 processes the captured information to determine whether to enable access to an account/network/entry, or other entry or privilege once identification has been confirmed. In one preferred embodiment, the system includes means to enable the user to enter a primary identifier, the identifier being a series of letters, digits, a spoken word converted to text (speech recognition), or

the like. The primary identifier is preferably the user's printed name, the user's birthday (and year), zip code, mother's maiden name, or PIN or password. (Black Col. 10 line 28-39 & Fig. 1).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Bellegarda in view of Besling to incorporate an identification circuit configured to identify an owner of said the stylus, wherein the system is configured to select the particular user message model at least in part in response to the identification circuit as taught by Black to allow for the proper identification of an owner of said stylus for the purposes of preventing an unknown user from accessing specific user-trained models/databases, wherein information specific to a user must be input prior to operation speech and/or handwriting operations

7. **Claims 89 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bellegarda et al. US 6285785 B1 (Bellegarda) in view of Besling and further in view of Ditzik US 6167376 A (hereinafter Ditzik).**

Re claim 89, Bellegarda in view of Besling fails to teach the system of claim 88, the system is configured to access the particular user message model is remotely available over via a wide area network.

While Bellegarda teaches training handwriting and acoustic models, Bellegarda fails to teach the use of particular user message model to substitute the general model of Bellegarda

Besling improves the existing language models of Bellegarda by allowing existing models to be updated for particular users, for instance, Besling already teaches existing word models such as that in Bellegarda. Specifically, Besling teaches a plurality of recognition models of a same type is formed by a basic recognition model and a plurality of adaptation profiles. Preferably, the basic model and the adaptation profiles are stored in a same storage, such as the storage means 314. The selection means 316 *selects a recognition model by selecting at least one of the adaptation profiles in dependence on the model improvement data associated with the user of the user station*. Storing means 318 are used for storing an indication of the selected adaptation profile in association with the user identifier. The retrieving means 320 retrieves a recognition model from the storage means 314 by retrieving an adaptation profile associated with the user identifier and adapting the basic recognition model under control of the adaptation profile (Besling Col 7 lines 45-65). Besling claims a plurality of different user-oriented recognition model sets, each set of a same type; in that the recognition enrolment step comprises selecting a user-oriented recognition model from a set of a same type in dependence on the model improvement data associated with the user; and storing an indication of the selected user-oriented recognition model in association with the user identifier; and in that the step of recognizing the input pattern comprises retrieving a user-oriented recognition model associated with the user

identifier transferred to the server station and incorporating the retrieved user-oriented recognition model in the model collection (e.g. Besling Claim 1 with Fig. 3 user stations).

Further, Besling analogously teaches well known uses of word language models with respect to HMM and statistic speech and handwriting models, wherein speech and handwriting recognition models can be applied for matching various input patterns (Besling Col. 2 line 27 – Col. 3 line 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Bellegarda to incorporate the use of particular user message model as taught by Besling to allow for improvement of basic trained statistical language data, by retrieving a user-oriented recognition model associated with a user identifier transferred to a server and incorporating the retrieved user-oriented recognition model in a model collection and retrieving a user-oriented recognition model associated with the user identifier transferred to the server and incorporating the retrieved user-oriented recognition model in the model collection (e.g. Besling Claim 1 with Fig. 3 user stations), where Besling can handle various patterns (i.e. handwriting and acoustic) (Besling Col. 2 line 27 – Col. 3 line 7), wherein the existing microphone & handwriting tablet/stylus as well as handwriting and speech models of Bellegarda are improved by Besling to have a collection updated based on multiple users utilizing tablets,stylus,microphones/etc. at multiple stations, wherein the user identification data via user-oriented models can be used to adapt the existing trained models with user *and/or* pre-existing training data (Besling Col 7 lines 45-65).

It would have also been obvious to one of ordinary skill in the art to apply a known technique of Besling acoustic/handwriting language user-model training to the known method of Bellegarda's acoustic/handwriting language model training with an existing user interface, wherein the teaching a of Bellegarda and Besling are analogous combinations that *now* include the incorporation of user-models as part of training for an explicitly improved and adapted set of already present system models (as in Bellegarda).

Ditzik teaches a system that uses ASR and AHR to correct user errors, which can be implemented via telephone, internet computer, etc. wherein a tablet can have internet connections such as a laptop having the screen shown in Fig. 4 of Ditzik (Claim 11 explicitly teaches a WAN such as the internet via a browser implemented via Fig. 4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Bellegarda in view of Besling to incorporate the system is configured to access the particular user message model is remotely available over via a wide area network as taught by Ditzik to allow for an improvement of Bellegarda to be portable or mobile, such as a tablet to engage in internet access while implementing ASR and AHR on a tablet (Claim 11 explicitly teaches a WAN such as the internet via a browser implemented via Fig. 4).

8. **Claims 90 and 91 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bellegarda et al. US 6285785 B1 (Bellegarda) in view of Besling and further in view of Bellegarda US 5839106 A (hereinafter Bellegarda(2)).**

Re claim 90, Bellegarda in view of Besling fails to teach the system of claim 81, wherein the system is configure to adjust text data generated from the acoustic model based at least in part on a syntactic model and a semantic model included in the particular user message model .

While Bellegarda teaches training handwriting and acoustic models, Bellegarda fails to teach the use of particular user message model to substitute the general model of Bellegarda

Besling improves the existing language models of Bellegarda by allowing existing models to be updated for particular users, for instance, Besling already teaches existing word models such as that in Bellegarda. Specifically, Besling teaches a plurality of recognition models of a same type is formed by a basic recognition model and a plurality of adaptation profiles. Preferably, the basic model and the adaptation profiles are stored in a same storage, such as the storage means 314. The selection means 316 *selects a recognition model by selecting at least one of the adaptation profiles in dependence on the model improvement data associated with the user of the user station*. Storing means 318 are used for storing an indication of the selected adaptation profile in association with the user identifier. The retrieving means 320 retrieves a recognition model from the storage means 314 by retrieving an adaptation profile associated with the user identifier and adapting the basic recognition model under

control of the adaptation profile (Besling Col 7 lines 45-65). Besling claims a plurality of different user-oriented recognition model sets, each set of a same type; in that the recognition enrolment step comprises selecting a user-oriented recognition model from a set of a same type in dependence on the model improvement data associated with the user; and storing an indication of the selected user-oriented recognition model in association with the user identifier; and in that the step of recognizing the input pattern comprises retrieving a user-oriented recognition model associated with the user identifier transferred to the server station and incorporating the retrieved user-oriented recognition model in the model collection (e.g. Besling Claim 1 with Fig. 3 user stations).

Further, Besling analogously teaches well known uses of word language models with respect to HMM and statistic speech and handwriting models, wherein speech and handwriting recognition models can be applied for matching various input patterns (Besling Col. 2 line 27 – Col. 3 line 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Bellegarda to incorporate the use of particular user message model as taught by Besling to allow for improvement of basic trained statistical language data, by retrieving a user-oriented recognition model associated with a user identifier transferred to a server and incorporating the retrieved user-oriented recognition model in a model collection and retrieving a user-oriented recognition model associated with the user identifier transferred to the server and incorporating the retrieved user-oriented recognition model in the model collection (e.g. Besling Claim 1 with Fig. 3 user stations), where Besling can handle various patterns

(i.e. handwriting and acoustic) (Besling Col. 2 line 27 – Col. 3 line 7), wherein the existing microphone & handwriting tablet/stylus as well as handwriting and speech models of Bellegarda are improved by Besling to have a collection updated based on multiple users utilizing tablets,stylus,microphones/etc. at multiple stations, wherein the user identification data via user-oriented models can be used to adapt the existing trained models with user *and/or* pre-existing training data (Besling Col 7 lines 45-65).

It would have also been obvious to one of ordinary skill in the art to apply a known technique of Besling acoustic/handwriting language user-model training to the known method of Bellegarda's acoustic/handwriting language model training with an existing user interface, wherein the teaching a of Bellegarda and Besling are analogous combinations that *now* include the incorporation of user-models as part of training for an explicitly improved and adapted set of already present system models (as in Bellegarda).

Bellegarda teaches a message recognition system 10 constructed and operated in accordance with a first embodiment of the invention. As employed herein a message is considered to be information generated by a human subject and entered into the system 10, the information being entered through an acoustic signal, a handwritten stroke signal, or through a combination of acoustic and stroke signals. The information may represent individual characters, including numbers, letters of the alphabet, punctuation and the like. The information may also represent words, phrases, and paragraphs.

Additionally, Bellegarda teaches a feature vector that is a combination of FV.sub.S and FV.sub.H. The speech and handwriting feature vectors are each generated in response to simultaneously provided acoustic and handwriting input. In that the sampling rates and durations of the input are different for the speech and handwriting channels a normalization block 52 normalizes the two inputs to a common time base and combines the normalized feature vectors into a single feature vector. This combination may be a synthetic concatenation of the four dimensional handwriting vector with the 20 dimensional speech vector, as indicated in FIG. 4e, to provide a 24 dimensional combined vector (FV.sub.S,H). (Bellegarda Col. 10 line 57 – Col. 11 line 7).

However, Bellegarda fails to teach a syntactic model and a semantic model

Bellegarda(2) teaches a hybrid recognition processor 220 might use an n-gram syntactic-type first model 310 to produce a list of candidate text messages from a sequence of feature vectors, and then employ a latent semantic-type second model 320 to rescore the list so that the most likely candidate, or hypothesis, is moved to the top of the list as necessary (Bellegarda(2) Col. 6 lines 51-67). Of course, such a sequential approach to integration will fail if the correct hypothesis is not included in the original list of candidates produced during the first recognition pass. Such failure may be prevented, however, by producing a relatively long list of candidates during the first pass, so that the original list is virtually guaranteed to include the correct hypothesis.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Bellegarda in view of Besling to incorporate wherein the system is configure to adjust text data generated from the acoustic model

based at least in part on a syntactic model and a semantic model included in the particular user message model as taught by Bellegarda(2) to allow for writing and speech complementing one another, wherein difficult pronunciations or spelling error may occur (i.e. a user can override writing a long word by just uttering the word itself). Additionally, it would have been obvious to one of ordinary skill in the art at the time of the invention a semantic and syntactic model for the purposes of further correcting a ranked list of potential candidates by analyzing the context and grammar rules for a language to receive speech or handwriting, wherein the best candidate can be selected to be generated as text while conserving memory resources

Re claim 91, Bellegarda in view of Besling fails to teach the system of claim 90, wherein said semantic model comprises at least one of:

(a) a semantic cluster of a first type that is a mathematically derived group of vectors representing text segments (Bellegarda(2) Col. 6 lines 51-67);

(b) a semantic cluster of a second type that is a discrete grouping of text that has a particular context; and

(c) a semantic cluster of a third type that is defined with respect to an individual reference word that is indicative of a particular context.

Bellegarda(2) teaches a hybrid recognition processor 220 might use an n-gram syntactic-type first model 310 to produce a list of candidate text messages from a sequence of feature vectors, and then employ a latent semantic-type second model 320 to rescore the list so that the most likely candidate, or hypothesis, is moved to the top of

the list as necessary (Bellegarda(2) Col. 6 lines 51-67). Of course, such a sequential approach to integration will fail if the correct hypothesis is not included in the original list of candidates produced during the first recognition pass. Such failure may be prevented, however, by producing a relatively long list of candidates during the first pass, so that the original list is virtually guaranteed to include the correct hypothesis.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Bellegarda in view of Besling to incorporate wherein said semantic model comprises at least one of:

(a) a semantic cluster of a first type that is a mathematically derived group of vectors representing text segments

(b) a semantic cluster of a second type that is a discrete grouping of text that has a particular context; and

(c) a semantic cluster of a third type that is defined with respect to an individual reference word that is indicative of a particular context.

as taught by Bellegarda(2) to allow for correcting a ranked list of potential candidates by analyzing the context and grammar rules for a language to receive speech or handwriting, wherein the best candidate can be selected to be generated as text while conserving memory resources (Bellegarda(2) Col. 6 lines 51-67);

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL COLUCCI whose telephone number is (571)270-1847. The examiner can normally be reached on 9 am - 6:00 pm , Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571)-272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael C Colucci/
Examiner, Art Unit 2626
Patent Examiner
AU 2626

(571)-270-1847
Examiner FAX: (571)-270-2847
Michael.Colucci@uspto.gov

Notice of References Cited	Application/Control No. 11/088,032	Applicant(s)/Patent Under Reexamination SUOMINEN, EDWIN A.	
	Examiner MICHAEL COLUCCI	Art Unit 2626	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,363,348 B1	03-2002	Besling et al.	704/270.1
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

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

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

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11088032	SUOMINEN, EDWIN A.
	Examiner	**Art Unit**
	Colucci, Michael C	2626

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/05/2007	06/04/2008	11/07/2008	04/16/2009	10/20/2009	11/12/2010	04/13/2011	09/19/2011	
	81	✓	✓	✓	✓	✓	✓	✓	✓	
	82	✓	✓	✓	✓	✓	✓	✓	✓	
	83	✓	✓	✓	✓	✓	✓	✓	✓	
	84	✓	✓	-	-	-	-	-	-	
	85	✓	✓	✓	✓	✓	✓	✓	✓	
	86		✓	✓	✓	✓	✓	✓	✓	
	87		✓	✓	✓	✓	✓	✓	✓	
	88		✓	✓	✓	✓	✓	✓	✓	
	89		✓	✓	✓	✓	✓	✓	✓	
	90		✓	✓	✓	✓	✓	✓	✓	
	91		✓	✓	✓	✓	✓	✓	✓	
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	102			✓	✓	✓	✓	-	-	
	103							✓	✓	
	104							✓	✓	
	105							✓	✓	
	106							✓	✓	
	107							✓	✓	
	108							✓	✓	
	109							✓	✓	
	110							✓	✓	

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L2	40	1 and handwriting	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2011/09/19 16:54
L1	729	(704/270.1).CCLS.	USPAT; USOCR	OR	OFF	2011/09/19 16:53
S159	21	S157 and S158	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2011/09/16 21:20
S158	10274881	@ad<="19990717"	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2011/09/16 21:20
S157	234	((hand$1writing (hand near1 writing)) same (voice speech)) and (user with model with (adapt$6 custom$7))	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2011/09/16 21:19

9/19/2011 4:55:35 PM
C:\East\Workspaces\11088032.wsp

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11088032	SUOMINEN, EDWIN A.
	Examiner	**Art Unit**
	Colucci, Michael C	2626

SEARCHED

Class	Subclass	Date	Examiner
382	187	11/5/2007	MC
704	256, 270	11/5/2007	MC
704	235, 257	6/4/2008	MC
379	56.1	6/4/2008	MC
382	124, 187	6/4/2008	MC
455	550.1	6/4/2008	MC
704	257	4/16/2009	MC
382	187	10/20/2009	MC
704	235	11/12/2010	MC
704	270.1	9/19/2011	mc

SEARCH NOTES

Search Notes	Date	Examiner
Searched 382/187 with keyword limitations	11/5/2007	MC
Searched 704/256 with keyword limitations	11/5/2007	MC
Searched 704/270 with keyword limitations	11/5/2007	MC
Consulted SPE Richemond Dorvil	11/5/2007	MC
Searched 704/235 with keyword limitations	6/4/2008	MC
Searched 704/257 with keyword limitations	6/4/2008	MC
Searched 379/56.1 with keyword limitations	6/4/2008	MC
Searched 382/124 with keyword limitations	6/4/2008	MC
Searched 455/550.1 with keyword limitations	6/4/2008	MC
Searched 382/187 with keyword limitations	6/4/2008	MC
Performed a double patenting search	5/27/2008	MC
Performed an inventors search	5/27/2008	MC
Consulted SPE Richemond Dorvil	5/27/2008	MC
Consulted Primary Examiner Talivaldis Smits	5/27/2008	MC
Checked the spec. for "medium" - not a signal	11/7/2008	MC
Searched 704/257 with keyword limitations	4/16/2009	MC
Searched 382/187 with keyword limitations	10/20/2009	MC
Searched 704/235 with keyword limitations	11/12/2010	MC
rechecked CRM claims - ok - magnetic medium [0016]	11/12/2010	MC
checked system claims - ok - computer memory and stylus tablet	11/12/2010	MC
checked method claims - ok - computer memory on device	11/12/2010	MC
checked apparatus claims - ok - computer memory within apparatus	11/12/2010	MC

SEARCH NOTES		
Search Notes	**Date**	**Examiner**
checked new method, apparatus, and system claims - ok, tablet is physical hardware which contains additional hardware or software. The present invention itself is not implemented as software. further "a device" is explicilty mentioned using a microphone and stylus input. Can not be performed mentally either, since there is a physical signal input into a microphone and a stylus is digital. In other words, it is not a field of use to use results from both ASR and handwriting together	4/13/2011	MC
checked CRM - ok tangible non-transitory	4/13/2011	MC
Searched 704/270.1 with keyword limitations	9/19/2011	MC

INTERFERENCE SEARCH			
Class	**Subclass**	**Date**	**Examiner**

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	11088032	Filing Date	2005-03-22	Docket Number (if applicable)	6257-33703	Art Unit	2626
First Named Inventor	Edwin A. Suominen			Examiner Name	Colucci, Michael C.		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

☐ Other _____

☒ Enclosed

☒ Amendment/Reply

☐ Information Disclosure Statement (IDS)

☐ Affidavit(s)/ Declaration(s)

☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____
(Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

☒ **The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.**
The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 501505

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Signature of Registered U.S. Patent Practitioner			
Signature	/Eric B. Min/	Date (YYYY-MM-DD)	2011-07-25
Name	Eric B. Min	Registration Number	54761

This collection of information is required by 37 CFR 1.114. 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.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal	
Application Number:	11088032
Filing Date:	22-Mar-2005
Title of Invention:	Message recognition using shared language model
First Named Inventor/Applicant Name:	Edwin A. Suominen
Filer:	Eric B. Min/Deena Beasley
Attorney Docket Number:	6257-33703
Filed as Large Entity	

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Request for continued examination	1801	1	810	810
		Total in USD ($)		**810**

Electronic Acknowledgement Receipt	
EFS ID:	10589045
Application Number:	11088032
International Application Number:	
Confirmation Number:	6401
Title of Invention:	Message recognition using shared language model
First Named Inventor/Applicant Name:	Edwin A. Suominen
Customer Number:	35690
Filer:	Eric B. Min/Deena Beasley
Filer Authorized By:	Eric B. Min
Attorney Docket Number:	6257-33703
Receipt Date:	25-JUL-2011
Filing Date:	22-MAR-2005
Time Stamp:	15:17:38
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$810
RAM confirmation Number	1663
Deposit Account	501505
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees) Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees) Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Response_to_Final_OA_04_25_11.pdf	101567 d2ef9727b1263acfb105557580edc80b9262f4b8	yes	11

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment Submitted/Entered with Filing of CPA/RCE	1	1
	Claims	2	7
	Applicant Arguments/Remarks Made in an Amendment	8	11

Warnings:					
Information:					
2	Request for Continued Examination (RCE)	RCE_Transmittal.pdf	697394 16d5a97f1672140b663c999795e999e2583b5f90	no	3
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	29815 a587c2619e3ecef9fb35f5f6fab3eb6d7883566f	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	828776	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor:	Edwin A. Suominen	§	Atty.Dkt.No.: 6257-33703
Serial Number:	11/088,032	§	Examiner: Colucci, Michael C.
Filing Date:	March 22, 2005	§	Group/Art Unit: 2626
Title:	MESSAGE RECOGNITION USING SHARED LANGUAGE MODEL	§	Conf. No. 6401

******CERTIFICATE OF E-FILING TRANSMISSION******

I hereby certify that this correspondence is being transmitted via electronic filing to the United States Patent and Trademark Office on the date shown below:

On: July 25, 2011 /Eric B. Min/
Date Eric B. Min, # 54,761

RESPONSE TO FINAL OFFICE ACTION MAILED APRIL 25, 2011

This paper is submitted in response to a Final Office Action of April 25, 2011, to further highlight why the application is in condition for allowance.

Please amend the case as listed below.

IN THE CLAIMS:

The following is a current listing of claims and will replace all prior versions and listings of claims in the application. Please amend the claims as follows:

1-80. (Canceled)

81. (Currently Amended) A system for generating text responsive to voice and handwriting input, comprising:

a tablet surface, wherein the system is configured to receive freehand input based at least in part on manipulation of a stylus relative to the tablet surface; and

a microphone for receiving voice input;

wherein the system is configured to:

select a particular user message model from a plurality of user message models;

adjust a local message model based at least in part on the particular user message model, wherein the local message model includes a handwriting model and an acoustic model;

generate text data based at least in part on the freehand input and on a handwriting model of the adjusted local message model; and

generate text data based at least in part on the voice input and on an acoustic model of the adjusted local message model[[;]]

~~adjust the text data generated from the freehand input based at least in part on a selected message model from a plurality of message models; and~~

~~adjust the text data generated from the voice input based at least in part on the selected message model~~.

82. (Currently Amended) The system of claim 81, wherein the system is further configured to:

identify information relating to a particular user;

wherein the particular user message model is selected ~~select the selected message model~~ based at least in part on the information relating to the particular user; and ~~a received user selection~~.

wherein the plurality of user message models includes two or more user message models corresponding to users that are different from the particular user.

83. (Previously Presented) The system of claim 82 wherein the microphone is housed in the stylus.

84. (Canceled)

85. (Currently Amended) The system of claim 81, wherein the system is further configured to train the ~~selected~~ particular user message model.

86. (Previously Presented) The system of claim 81, further comprising a proximity sensor configured to sense a proximity of a user to the microphone.

87. (Currently Amended) The system of claim 81, further comprising an identification circuit configured to identify an owner of the stylus, wherein the system is configured to select the ~~selected~~ particular user message model at least in part in response to the identification circuit.

88. (Currently Amended) The system of claim 81, wherein the system is configured to select the ~~selected~~ particular user message model based at least in part on an identifying signal received from the microphone.

89. (Currently Amended) The system of claim 88, wherein the system is configured to access the ~~selected~~ particular user message model via a wide area network.

90. (Currently Amended) The system of claim 81, wherein the system is configure to adjust text data generated from the acoustic model based at least in part on a syntactic model and a semantic model included in the ~~selected~~ particular user message model.

91. (Previously Presented) The system of claim 90, wherein the semantic model comprises at least one of:

a semantic cluster of a first type that is a mathematically derived group of vectors representing text segments;

a semantic cluster of a second type that is a discrete grouping of text having a particular context; and

a semantic cluster of a third type that is defined with respect to an individual reference word that is indicative of a particular context.

92. (Previously Presented) The system of claim 81, further comprising an activation circuit configured to sense movement of the stylus toward the tablet surface, wherein the system is further configured to receive the freehand input in response to the activation circuit sensing the movement.

93. (Currently Amended) The system of claim 81, wherein the ~~selected~~ particular user message model includes user-specific acoustic model information and user-specific handwriting model information.

94-102. (Canceled)

103. (Currently Amended) A method, comprising:

receiving, at a device, freehand input based at least in part on manipulation of a stylus;

receiving, at [[a]] the device, audio input based at least in part on information received at a microphone;

selecting, via the device, a selected user message model from a plurality of user message models;

adjusting, via the device, a local message model that includes a handwriting model and an acoustic model, wherein the adjusting the local message model is based at least in part on the selected user message model;

generating, by the device, converted handwriting text data based at least in part on the freehand input[[,]] and on the [[a]] handwriting model[[,]] ~~and the selected~~ of the adjusted local message model; and

generating, by the device, converted speech text data based at least in part on the audio input[[,]] and on the [[an]] acoustic model[[,]] ~~and the selected~~ of the adjusted local message model.

104. (Previously Presented) The method according to claim 103, further comprising switching from receiving audio input to receiving freehand input in response to detecting movement of the stylus towards a tablet.

105. (Currently Amended) The method according to claim 103, further comprising accessing ~~at least one of the handwriting model, the acoustic model and~~ the selected user message model via a network.

106. (Currently Amended) The method according to claim 103, further comprising training the selected user message model.

107. (Currently Amended) The method according to claim 103, further comprising training the acoustic model of the local message model.

108. (Currently Amended) The method according to claim 103, further comprising training the handwriting model of the local message model.

109. (Currently Amended) An article of manufacture including a tangible non-transitory computer-readable medium having stored thereon instructions executable by a computing device to cause the computing device to perform operations comprising:

receiving freehand input based at least in part on manipulation of a stylus;

receiving audio input based at least in part on information received at a microphone;

selecting a ~~selected~~ particular user message model from a plurality of user message models;

adjusting a local message model based at least in part on the particular user message model, the local message model including a handwriting model and an acoustic model;

generating converted handwriting text data based at least in part on the freehand input and on [[a]] the handwriting model of the adjusted local message model; and

generating converted speech text data based at least in part on the audio input and on [[an]] the acoustic model of the adjusted local message model[[; and]]

~~adjusting, using the selected message model, at least one of the converted handwriting text data and the converted speech text data~~.

110. (Currently Amended) An apparatus, comprising:

means for receiving freehand input based at least in part on manipulation of a stylus;

means for receiving audio input based at least in part on audio information; ~~and~~

means for selecting a ~~selected~~ particular user message model from a plurality of user message models;

means for adjusting a local message model based at least in part on the particular user message model, the local message model including a handwriting model and an acoustic model;

~~wherein the apparatus is configured to:~~ means for generat[[e]]ing converted handwriting text data based at least in part on the freehand input[[,]] ~~a handwriting model,~~ and on the ~~selected~~ handwriting model of the adjusted local message model; and

means for generat[[e]]ing converted speech text data based at least in part on the audio input[[,]] ~~an acoustic model,~~ and on the ~~selected~~ acoustic model of the adjusted local message model.

REMARKS:

Claims 81-83, 85-93, and 103-110 were pending in the application at the time of the Office Action. No claims are added or canceled herein. Claims 81, 82, 85, 87-90, 93, 103, and 105-110 are amended. Therefore, claims 81-83, 85-93, and 103-110 remain pending in this application.

Statement of Substance of Interview

Applicant thanks the Examiner for extending the courtesy of conducting a telephone interview on June 14, 2011, and continuing on June 16, 2011. Participating in the interview were Examiner Colucci and Applicant's undersigned representative. Applicant's proposed clarifying amendments were discussed in view of the cited references and the specification.

The Examiner agreed that the discussed amendments, presented herein, overcome the art of record. No agreement was reached as to allowability.

Art-Based Rejections

All pending claims stand rejected under 35 U.S.C. § 102(b) as being anticipated by Bellegarda '785 (U.S. Patent No. 6,285,785), or under 35 U.S.C. § 103 as being unpatentable over various combinations of Bellegarda '785, Shim (U.S. Patent No. 6853850), Black (U.S. Patent No. 6,307,956), Ditzik (U.S. Patent No. 6,167,376), and Bellegarda '106 (U.S. Patent No. 5,839,106). Applicant respectfully disagrees with the rejections. However, amendments are presented herein in an effort to bring the claims to issue more rapidly.

In rejecting the previously pending version of claim 81, the Office Action applies the Bellegarda '785 reference as follows:

> generate text data based at least in part on the freehand input and on a **handwriting model** (Col. 12 lines 5-38 hand writing converted to text compatible with keyboard or word processing system for instance, well known for [automated handwriting recognition])
>
> generate text data based at least in part on the voice input and on an **acoustic model** (Col 12 lines 39-65, handwriting input, [automated

> speech recognition] and [automated handwriting recognition] used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model)
>
> adjust the text data generated from the freehand input based at least in part on a **selected message model** from a plurality of message models (Col 12 lines 39-65, speech input, [automated speech recognition] and [automated handwriting recognition] used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model);

Office Action at 3 (emphasis added). Thus, the Office Action relies on the Bellegarda '785 reference's general description of automated handwriting recognition as corresponding to both the "handwriting model" and the "message model" recited in claim 81. Similarly, the Office Action appears to rely on the Belegarda '785 reference's general description of automated speech recognition as corresponding to both the "acoustic model" and the "message model" of claim 81.

Amended claim 81 clarifies features related to the "message model," "acoustic model," and "handwriting model" that are not disclosed in Bellegarda '785. For example, amended claim 81 recites in part as follows:

> select a particular **user message model** from a plurality of user message models;
>
> adjust a **local message model** based at least in part on the particular user message model, wherein the local message model includes a **handwriting model** and an **acoustic model**;

Accordingly, Applicant submits that Bellegarda '785 fails to disclose, teach, or suggest "select[ing] a particular user message model" and "adjust[ing] a local message model" that "includes a handwriting model and an acoustic model," as is recited in amended claim 81.

The other cited references fail to cure the deficiencies of Bellagara. For example, the Shim reference is directed to a "[m]ethod and system for controlling operation of radiotelephone speaker volume and/or microphone gain." Shim at Abstract. The Office Action cites Shim as allegedly teaching "a proximity sensor configured to sense a proximity of a user to the microphone." Office Action at 10. The Black reference is directed to an "identity verification system [that] employs biometric technology for identity verification." Black at Abstract. Black is cited as allegedly teaching "an identification circuit configured to identify an owner of [] the

stylus, wherein the system is configured to select the selected message model at least in part in response to the identification circuit." Office Action at 11. Ditzik is directed to "[a] computer system with speech recognition systems and handwriting recognition systems . . . that work closely together to improve the total recognition accuracy of each system alone." The Office Action cites Ditzik as allegedly teaching "a system that uses ASR and AHR to correct user errors, which can be implemented via telephone, internet computer, etc. wherein a tablet can have internet connections such as a laptop having the screen." Office Action at 12. Bellegarda '106 is directed to "[m]ethods and apparatus for performing large-vocabulary speech recognition employing an integrated syntactic and semantic statistical language model." Bellegarda '106 at Abstract. The Office Action cites the Bellegarda '106 reference as allegedly teaching "use [of] an n-gram syntactic-type first model 310 to produce a list of candidate text messages from a sequence of feature vectors." Office Action at 14. Applicant submits that these references, taken alone or in combination, fail to teach or suggest "select[ing] a particular user message model" and "adjust[ing] a local message model" that "includes a handwriting model and an acoustic model," as is recited in amended claim 81.

As noted above, the Examiner agreed during the June 14 / June 16 interview that the above-discussed amendments overcome the present rejections.

For at least the reasons discussed above, the cited references do not disclose, teach, or suggest all of the features of amended independent claim 81. Thus, neither a *prima facie* of anticipation nor a *prima facie* case of obviousness can be established with respect to independent claim 81 or the claims that depend therefrom. Similar remarks also apply to amended independent claims 103, 109, and 110, as well as the claims that depend therefrom, although these claims have different scope than claim 81.

CONCLUSION:

Applicant respectfully submits the application is in condition for allowance, and an early notice to that effect is requested.

If any extension of time (under 37 C.F.R. § 1.136) is necessary to prevent the above-referenced application from becoming abandoned, Applicant hereby petitions for such extension.

The Commissioner is authorized to charge any fees that may be required, or credit any overpayment, to Meyertons, Hood, Kivlin, Kowert & Goetzel, P.C. Deposit Account No. 501505/6257-33703/EBM.

Also filed herewith are the following items:

☒ Request for Continued Examination

Respectfully submitted,

Date: July 25, 2011

By: /Eric B. Min/
Eric B. Min
Reg. No. 54,761
Attorney for Applicant

Meyertons, Hood, Kivlin, Kowert & Goetzel, P.C.
P.O. Box 398
Austin, TX 78767-0398
(512) 853-8862

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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MEYERTONS, HOOD, KIVLIN, KOWERT & GOETZEL, P.C.
P.O. BOX 398
AUSTIN, TX 78767-0398

EXAMINER	
COLUCCI, MICHAEL C	
ART UNIT	PAPER NUMBER
2626	

NOTIFICATION DATE	DELIVERY MODE
04/25/2011	ELECTRONIC

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

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patent_docketing@intprop.com
ptomhkkg@gmail.com

Office Action Summary	Application No.	Applicant(s)	
	11/088,032	SUOMINEN, EDWIN A.	
	Examiner	Art Unit	
	MICHAEL C. COLUCCI	2626	

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 February 2011*.

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

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

Disposition of Claims

4)☒ Claim(s) *81-83,85-93 and 103-110* is/are pending in the application.

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

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *81-83,85-93 and 103-110* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

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

Application Papers

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

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

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

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

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

Priority under 35 U.S.C. § 119

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

a)☐ All b)☐ Some * c)☐ None of:

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

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

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

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

Attachment(s)

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

DETAILED ACTION

Response to Arguments

1. Applicants arguments with respect to claims 81-83, 85-93, and 103-110 have been considered but are moot in view of the new grounds of rejection. In view of the February 8th 2011 interview, Examiner has incorporated the use of Bellegarda et al. US 6285785 B1 (Bellegarda) alone to address amended independent claims, wherein "context" is omitted and the claim language clarified. Please see rejection below.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 81-83, 85, 88, 92, 93, and 103-110 are rejected under 35 U.S.C. 102(b) as being anticipated by Bellegarda et al. US 6285785 B1 (Bellegarda).

Re claim 81, Bellegarda teaches a system for generating text responsive to ~ voice and handwriting input, comprising:

a tablet surface, wherein the system is configured to receive freehand input based at least in part on manipulation of a stylus relative to the tablet surface (Col 12 lines 39-65, tablet surface to accept hand writing).

a microphone for receiving voice input (Fig. 1 element 22 microphone);

wherein the system is configured to:

generate text data based at least in part on the freehand input and on a handwriting model (Col. 12 lines 5-38 hand writing converted to text compatible with keyboard or word processing system for instance, well known for AHR)

generate text data based at least in part on the voice input and on an acoustic model (Col 12 lines 39-65, handwriting input, ASR and AHR used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model)

adjust the text data generated from the freehand input based at least in part on a selected message model from a plurality of message models (Col 12 lines 39-65, speech input, ASR and AHR used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model);

adjust the text data generated from the voice input based at least in part on the selected message model (Col 12 lines 39-65, ASR and AHR used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model)

Re claim 82, Bellegarda teaches the system of claim 81, wherein the system is further configured to select the selected message model based at least in part on a received user selection (Col 12 lines 39-65, ASR and AHR used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model)

Re claim 83, Bellegarda teaches the system of claim 82 wherein the microphone is housed in the stylus (Col 12 lines 39-65, tablet surface to accept hand writing, stylus element 20 in Fig. 1).

Re claim 85, Bellegarda teaches the system of claim 82 wherein the system is further configured to train the selected message model (Fig. 1 training via feedback).

Re claim 88, Bellegarda teaches the system of claim 81, wherein the system is configured to select the selected message model based at least in part on an identifying signal received from the microphone (Col 12 lines 39-65, ASR and AHR used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model).

Re claim 92, Bellegarda teaches the system of claim 81, further comprising an activation circuit configured to sense movement of the stylus toward the tablet surface, wherein the system is further configured to receive the freehand input in response to the

activation circuit sensing the movement (Fig 4a, such as pressure when contact is made toward the surface).

Re claim 93, Bellegarda teaches the system of claim 81, wherein the selected message model includes user-specific acoustic model information and user-specific handwriting model information (Col 12 lines 39-65, user editing such as element 12 interface for correction, training, ASR and AHR used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model).

Re claim 103, Bellegarda teaches a method, comprising:

receiving, at a device, freehand input based at least in part on manipulation of a stylus (Col 12 lines 39-65, tablet surface to accept hand writing element 20 stylus);

receiving, at a device, audio input based at least in part on information received at a microphone (Fig. 1 element 22 microphone);

selecting, via the device, a selected message model from a plurality of message models (Col. 12 lines 5-38 hand writing converted to text compatible with keyboard or word processing system for instance, well known for AHR);

generating, by the device, converted handwriting text data based at least in part on the freehand input, a handwriting model, and the selected message model (Col 12 lines 39-65, handwriting input, ASR and AHR used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model);

generating, by the device, converted speech text data based at least in part on the audio input, an acoustic model, and the selected message model (Col 12 lines 39-65, speech input, ASR and AHR used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model).

Re claim 104, Bellegarda teaches the method according to claim 103, further comprising switching from receiving audio input to receiving freehand input in response to detecting movement of the stylus towards a tablet (Fig 4a, such as pressure when contact is made toward the surface).

Re claim 105, Bellegarda teaches the method according to claim 103, further comprising accessing at least one of the handwriting model, the acoustic model and the selected message model via a network (Col 12 lines 39-65, handwriting input, ASR and AHR used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model).

Re claim 106, Bellegarda teaches the method according to claim 103, further comprising training the selected message model (Fig. 1 elements 12 fed back into element 28 and 32 for instance to train through hand writing).

Re claim 107, Bellegarda teaches the method according to claim 103, further comprising training the acoustic model (Fig. 1 element 34, speech model trained through element 12 and 30).

Re claim 108, Bellegarda teaches the method according to claim 103, further comprising training the handwriting model (Fig. 1 element 32, handwriting model trained through element 12 and 28)

Re claim 109, Bellegarda teaches an article of manufacture including a tangible non-transitory computer-readable medium having stored thereon instructions executable by a computing device to cause the computing device to perform operations comprising:

receiving freehand input based at least in part on manipulation of a stylus (Col 12 lines 39-65, tablet surface to accept hand writing);

receiving audio input based at least in part on information received at a microphone (Fig. 1 element 22 microphone);

selecting a selected message model from a plurality of message models (Col 12 lines 39-65, ASR and AHR used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model);

generating converted handwriting text data based at least in part on the freehand input and on a handwriting model (Col 12 lines 39-65, handwriting input, ASR and AHR

used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model);

generating converted speech text data based at least in part on the audio input and on an acoustic model (Col 12 lines 39-65, speech input, ASR and AHR used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model); and

adjusting, using the selected message model, at least one of the converted handwriting text data and the converted speech text data (Col 12 lines 39-65, ASR and AHR used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model)

Re claim 110, Bellegarda teaches an apparatus, comprising:

means for receiving freehand input based at least in part on manipulation of a stylus (Col 12 lines 39-65, tablet surface to accept hand writing);

means for receiving audio input based at least in part on audio information (Fig. 1 element 22 microphone); and

means for selecting a selected message model from a plurality of message models (Col 12 lines 39-65, ASR and AHR used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model);

wherein the apparatus is configured to:

generate converted handwriting text data based at least in part on the freehand

input, a handwriting model, and the selected message model (Col 12 lines 39-65, handwriting input, ASR and AHR used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model); and

generate converted speech text data based at least in part on the audio input, an acoustic model, and the selected message model (Col 12 lines 39-65, speech input, ASR and AHR used to correct one another via training through element 34 and 32 of Fig. 1, speech model and writing model)

Claim Rejections - 35 USC § 103

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

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 86 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bellegarda et al. US 6285785 B1 (Bellegarda) in view of Shim et al. US 6853850 B2 (hereinafter Shim).

Re claim 86, Bellegarda fails to teach the system of claim 81, further comprising a proximity sensor configured to sense a proximity of a user to the microphone.

Shim teaches adjusting the speaker volume and/or the microphone gain to provide optimum audio signal levels for that situation. If the estimated sensor-head distance is greater than the reference distance, the system (1) adjusts the speaker volume and/or the microphone gain to its maximum signal level and/or (2) notifies the user that the maximum signal level may be inadequate to maintain acceptable audio communication and/or (3) disables the speaker and/or the microphone until the sensor-head distance is no greater than the reference distance or (4) takes no action. More than one proximity zone, each with its own reference distance and/or zone center, can be defined and sensed by the system. The minimum-to-maximum range for speaker volume and/or for microphone gain is adjustable for each user (Shim Col. 1 line 67 – Col. 2 line 22).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Bellegarda to incorporate a proximity sensor configured to sense a proximity of a user to the microphone as taught by Shim to allow for ideal audio levels that can be input into the processor for accurate speech recognition, wherein a minimum and maximum distance from the microphone can be implemented to establish thresholds

6. **Claim 87 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bellegarda et al. US 6285785 B1 (Bellegarda) in view of Black US 6307956 B1 (hereinafter Black).**

Re claim 87, Bellegarda fails to teach system of claim 81, further comprising an identification circuit configured to identify an owner of said the stylus, wherein the system is configured to select the selected message model at least in part in response to the identification circuit.

Black teaches a stylus 15 includes one or more sensors 20 that capture biometric properties of the user. The computer (chip) 40 processes the captured information to determine whether to enable access to an account/network/entry, or other entry or privilege once identification has been confirmed. In one preferred embodiment, the system includes means to enable the user to enter a primary identifier, the identifier being a series of letters, digits, a spoken word converted to text (speech recognition), or the like. The primary identifier is preferably the user's printed name, the user's birthday (and year), zip code, mother's maiden name, or PIN or password. (Black Col. 10 line 28-39 & Fig. 1).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Bellegarda to incorporate an identification circuit configured to identify an owner of said the stylus, wherein the system is configured to select the selected message model at least in part in response to the identification circuit as taught by Black to allow for the proper identification of an owner of said stylus for the purposes of preventing an unknown user from accessing specific

user-trained models/databases, wherein information specific to a user must be input prior to operation speech and/or handwriting operations

7. **Claims 89 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bellegarda et al. US 6285785 B1 (Bellegarda) in view of Ditzik US 6167376 A (hereinafter Ditzik).**

Re claim 89, Bellegarda fails to teach the system of claim 88, the system is configured to access the selected message model is remotely available over via a wide area network.

Ditzik teaches a system that uses ASR and AHR to correct user errors, which can be implemented via telephone, internet computer, etc. wherein a tablet can have internet connections such as a laptop having the screen shown in Fig. 4 of Ditzik (Claim 11 explicitly teaches a WAN such as the internet via a browser implemented via Fig. 4).

Therefore, it would have been obvious Bellegarda one of ordinary skill in the art at the time of the invention to modify the system of Ditzik to incorporate the system is configured to access the selected message model is remotely available over via a wide area network as taught by Ditzik to allow for an improvement of Bellegarda to be portable or mobile, such as a tablet to engage in internet access while implementing ASR and AHR on a tablet (Claim 11 explicitly teaches a WAN such as the internet via a browser implemented via Fig. 4).

8. **Claims 90 and 91 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bellegarda et al. US 6285785 B1 (Bellegarda) in view of Bellegarda US 5839106 A (hereinafter Bellegarda(2)).**

Re claim 90, Bellegarda fails to teach the system of claim 81, wherein the system is configure to adjust text data generated from the acoustic model based at least in part on a syntactic model and a semantic model included in the selected message model

Bellegarda teaches a message recognition system 10 constructed and operated in accordance with a first embodiment of the invention. As employed herein a message is considered to be information generated by a human subject and entered into the system 10, the information being entered through an acoustic signal, a handwritten stroke signal, or through a combination of acoustic and stroke signals. The information may represent individual characters, including numbers, letters of the alphabet, punctuation and the like. The information may also represent words, phrases, and paragraphs.

Additionally, Bellegarda teaches a feature vector that is a combination of FV.sub.S and FV.sub.H. The speech and handwriting feature vectors are each generated in response to simultaneously provided acoustic and handwriting input. In that the sampling rates and durations of the input are different for the speech and handwriting channels a normalization block 52 normalizes the two inputs to a common

time base and combines the normalized feature vectors into a single feature vector. This combination may be a synthetic concatenation of the four dimensional handwriting vector with the 20 dimensional speech vector, as indicated in FIG. 4e, to provide a 24 dimensional combined vector (FV.sub.S,H). (Bellegarda Col. 10 line 57 – Col. 11 line 7).

However, Bellegarda fails to teach a syntactic model and a semantic model

Bellegarda(2) teaches a hybrid recognition processor 220 might use an n-gram syntactic-type first model 310 to produce a list of candidate text messages from a sequence of feature vectors, and then employ a latent semantic-type second model 320 to rescore the list so that the most likely candidate, or hypothesis, is moved to the top of the list as necessary (Bellegarda(2) Col. 6 lines 51-67). Of course, such a sequential approach to integration will fail if the correct hypothesis is not included in the original list of candidates produced during the first recognition pass. Such failure may be prevented, however, by producing a relatively long list of candidates during the first pass, so that the original list is virtually guaranteed to include the correct hypothesis.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Bellegarda to incorporate wherein the system is configure to adjust text data generated from the acoustic model based at least in part on a syntactic model and a semantic model included in the selected message model as taught by Bellegarda(2) to allow for writing and speech complementing one another, wherein difficult pronunciations or spelling error may occur (i.e. a user can override writing a long word by just uttering the word itself). Additionally, it would have been obvious to one of ordinary skill in the art at the time of the invention a semantic

and syntactic model for the purposes of further correcting a ranked list of potential candidates by analyzing the context and grammar rules for a language to receive speech or handwriting, wherein the best candidate can be selected to be generated as text while conserving memory resources

Re claim 91, Ditzik in view of Bellegarda and Kahn fails to teach the system of claim 90, wherein said semantic model comprises at least one of:

(a) a semantic cluster of a first type that is a mathematically derived group of vectors representing text segments (Bellegarda(2) Col. 6 lines 51-67);

(b) a semantic cluster of a second type that is a discrete grouping of text that has a particular context; and

(c) a semantic cluster of a third type that is defined with respect to an individual reference word that is indicative of a particular context.

Bellegarda(2) teaches a hybrid recognition processor 220 might use an n-gram syntactic-type first model 310 to produce a list of candidate text messages from a sequence of feature vectors, and then employ a latent semantic-type second model 320 to rescore the list so that the most likely candidate, or hypothesis, is moved to the top of the list as necessary (Bellegarda(2) Col. 6 lines 51-67). Of course, such a sequential approach to integration will fail if the correct hypothesis is not included in the original list of candidates produced during the first recognition pass. Such failure may be prevented, however, by producing a relatively long list of candidates during the first pass, so that the original list is virtually guaranteed to include the correct hypothesis.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Bellegarda to incorporate wherein said semantic model comprises at least one of:

(a) a semantic cluster of a first type that is a mathematically derived group of vectors representing text segments

(b) a semantic cluster of a second type that is a discrete grouping of text that has a particular context; and

(c) a semantic cluster of a third type that is defined with respect to an individual reference word that is indicative of a particular context.

as taught by Bellegarda(2) to allow for correcting a ranked list of potential candidates by analyzing the context and grammar rules for a language to receive speech or handwriting, wherein the best candidate can be selected to be generated as text while conserving memory resources (Bellegarda(2) Col. 6 lines 51-67);

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL C. COLUCCI whose telephone number is (571)270-1847. The examiner can normally be reached on 8:30 am - 5:00 pm , Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571)-272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael C Colucci/
Examiner, Art Unit 2626
Patent Examiner
AU 2626
(571)-270-1847
Examiner FAX: (571)-270-2847
Michael.Colucci@uspto.gov

/Richemond Dorvil/
Supervisory Patent Examiner, Art Unit 2626

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11088032	SUOMINEN, EDWIN A.
	Examiner	Art Unit
	Colucci, Michael C	2626

SEARCHED			
Class	Subclass	Date	Examiner
382	187	11/5/2007	MC
704	256, 270	11/5/2007	MC
704	235, 257	6/4/2008	MC
379	56.1	6/4/2008	MC
382	124, 187	6/4/2008	MC
455	550.1	6/4/2008	MC
704	257	4/16/2009	MC
382	187	10/20/2009	MC
704	235	11/12/2010	MC

SEARCH NOTES		
Search Notes	Date	Examiner
Searched 382/187 with keyword limitations	11/5/2007	MC
Searched 704/256 with keyword limitations	11/5/2007	MC
Searched 704/270 with keyword limitations	11/5/2007	MC
Consulted SPE Richemond Dorvil	11/5/2007	MC
Searched 704/235 with keyword limitations	6/4/2008	MC
Searched 704/257 with keyword limitations	6/4/2008	MC
Searched 379/56.1 with keyword limitations	6/4/2008	MC
Searched 382/124 with keyword limitations	6/4/2008	MC
Searched 455/550.1 with keyword limitations	6/4/2008	MC
Searched 382/187 with keyword limitations	6/4/2008	MC
Performed a double patenting search	5/27/2008	MC
Performed an inventors search	5/27/2008	MC
Consulted SPE Richemond Dorvil	5/27/2008	MC
Consulted Primary Examiner Talivaldis Smits	5/27/2008	MC
Checked the spec. for "medium" - not a signal	11/7/2008	MC
Searched 704/257 with keyword limitations	4/16/2009	MC
Searched 382/187 with keyword limitations	10/20/2009	MC
Searched 704/235 with keyword limitations	11/12/2010	MC
rechecked CRM claims - ok - magnetic medium [0016]	11/12/2010	MC
checked system claims - ok - computer memory and stylus tablet	11/12/2010	MC
checked method claims - ok - computer memory on device	11/12/2010	MC
checked apparatus claims - ok - computer memory within apparatus	11/12/2010	MC

SEARCH NOTES		
Search Notes	**Date**	**Examiner**
checked new method, apparatus, and system claims - ok, tablet is physical hardware which contains additional hardware or software. The present invention itself is not implemented as software. further "a device" is explicilty mentioned using a microphone and stylus input. Can not be performed mentally either, since there is a physical signal input into a microphone and a stylus is digital. In other words, it is not a field of use to use results from both ASR and handwriting together	4/13/2011	MC
checked CRM - ok tangible non-transitory	4/13/2011	MC

INTERFERENCE SEARCH			
Class	**Subclass**	**Date**	**Examiner**

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11088032	SUOMINEN, EDWIN A.
	Examiner	Art Unit
	Colucci, Michael C	2626

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/05/2007	06/04/2008	11/07/2008	04/16/2009	10/20/2009	11/12/2010	04/13/2011		
	81	✓	✓	✓	✓	✓	✓	✓		
	82	✓	✓	✓	✓	✓	✓	✓		
	83	✓	✓	✓	✓	✓	✓	✓		
	84	✓	✓	-	-	-	-	-		
	85	✓	✓	✓	✓	✓	✓	✓		
	86		✓	✓	✓	✓	✓	✓		
	87		✓	✓	✓	✓	✓	✓		
	88		✓	✓	✓	✓	✓	✓		
	89		✓	✓	✓	✓	✓	✓		
	90		✓	✓	✓	✓	✓	✓		
	91		✓	✓	✓	✓	✓	✓		
	92		✓	✓	✓	✓	✓	✓		
	93		✓	✓	✓	✓	✓	✓		
	94		✓	✓	✓	✓	✓	-		
	95		✓	✓	✓	✓	✓	-		
	96		✓	✓	✓	✓	✓	-		
	97		✓	✓	✓	✓	✓	-		
	98		✓	✓	✓	✓	✓	-		
	99		✓	✓	✓	✓	✓	-		
	100		✓	✓	✓	✓	✓	-		
	101			✓	✓	✓	✓	-		
	102			✓	✓	✓	✓	-		
	103							✓		
	104							✓		
	105							✓		
	106							✓		
	107							✓		
	108							✓		
	109							✓		
	110							✓		

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor:	Edwin Suominen	§	Atty.Dkt.No.: 6257-33703
Serial Number:	11/088,032	§	Examiner: Colucci, Michael C.
Filing Date:	March 22, 2005	§	Group/Art Unit: 2626
Title:	MESSAGE RECOGNITION USING SHARED LANGUAGE MODEL	§	Conf. No. 6401

******CERTIFICATE OF E-FILING TRANSMISSION******

I hereby certify that this correspondence is being transmitted via electronic filing to the United States Patent and Trademark Office on the date shown below:

On: February 21, 2011 /Eric B. Min/
Date Eric B. Min, # 54,761

RESPONSE TO OFFICE ACTION MAILED NOVEMBER 30, 2010

This paper is submitted in response to an Office Action of November 30, 2010, to further highlight why the application is in condition for allowance.

Please amend the case as listed below.

IN THE CLAIMS:

The following is a current listing of claims and will replace all prior versions and listings of claims in the application. Please amend the claims as follows:

1-80. (Canceled)

81. (Currently Amended) A system for generating text responsive to ~~both~~ voice and handwriting input, comprising:

~~a tablet including~~ a tablet surface, wherein the system is configured to receive ~~responsive to~~ freehand input ~~conveyed via~~ based at least in part on manipulation of a stylus ~~on or near~~ relative to the tablet surface ~~to render ink-like indicia of the freehand input~~[[,]]; and

a microphone for receiving voice input; ~~a message recognizer including:~~

wherein the system is configured to:

generate text data based at least in part on the freehand input and on a handwriting model;

~~a speech recognizer and a handwriting recognizer; wherein the speech recognizer is responsive~~ generate text data based at least in part on the voice input and on an acoustic model ~~conveyed via a microphone to provide text data of a memory in accordance with both a shared language model, the shared language model having: a present context based on words in the provided text data of the memory, and an acoustic model~~;

adjust the text data generated from the freehand input based at least in part on a selected message model from a plurality of message models; and

adjust the text data generated from the voice input based at least in part on the selected message model.

~~wherein the system is configured to improve the accuracy of the shared language model by detecting instances in which a word or text segment obtained from the speech or handwriting recognizer is not contained within the present context and to obtain user input indicative of a user context when a text segment of received user input is outside of the present context; and~~

~~wherein the handwriting recognizer is responsive to freehand input conveyed via the stylus to provide text data in accordance with both the shared language model and a handwriting model.~~

82. (Currently Amended) The system of claim 81, wherein the system is further configured to select the selected message model based at least in part on a received user selection. ~~microphone is mounted substantially beyond an immediate vicinity of the head of an individual interacting with the system~~.

83. (Previously Presented) The system of claim 82 wherein the microphone is housed in the stylus.

84. (Canceled)

85. (Currently Amended) The system of claim 81, wherein[[:]] the system is further configured to train the selected message model.

~~the speech recognizer provides text data without being responsive to freehand input supplied to the handwriting recognizer; and~~

~~the handwriting recognizer provides text data without being responsive to voice input supplied to the speech recognizer.~~

86. (Currently Amended) The system of claim 81, ~~wherein said stylus is equipped with~~ further comprising a proximity sensor ~~that is~~ configured to sense a proximity of a ~~human head~~ user to ~~said~~ the microphone.

87. (Currently Amended) The system of claim 81, ~~wherein said stylus is equipped with~~ further comprising an identification circuit ~~that is~~ configured to identify an owner of ~~said~~ the stylus, wherein the system is configured to select the selected message model at least in part in response to the identification circuit.

88. (Currently Amended) The system of claim 81, wherein the system is configured to select the selected message model based at least in part on an identifying signal received from the microphone ~~at least one of said speech recognizer and said handwriting recognizer is configured~~

~~to be responsive to an identifying signal to select a particular user message model to use when generating text responsive to said voice input~~.

89. (Currently Amended) The system of claim 88, wherein ~~said particular user~~ the system is configured to access the selected message model ~~is remotely available over~~ via a wide area network.

90. (Currently Amended) The system of claim 81, ~~further comprising a unified message model that includes an acoustic model, said handwriting model, and said shared language model, wherein said shared language~~ wherein the system is configure to adjust text data generated from the acoustic model based at least in part on ~~model includes~~ a syntactic model and a semantic model included in the selected message model.

91. (Currently Amended) The system of claim 90, wherein ~~said~~ the semantic model comprises at least one of:

a semantic cluster of a first type that is a mathematically derived group of vectors representing text segments;

a semantic cluster of a second type that is a discrete grouping of text ~~that has~~ having a particular context; and

a semantic cluster of a third type that is defined with respect to an individual reference word that is ~~considered to be~~ indicative of a particular context.

92. (Currently Amended) The system of claim 81, further comprising an activation circuit ~~that is~~ configured to sense ~~when a user moves said~~ movement of the stylus ~~away from said user's mouth and~~ toward ~~said~~ the tablet surface, wherein the system is further configured to receive the freehand input in response to the activation circuit sensing the movement ~~in order to configure said tablet for editing~~.

93. (Currently Amended) The system of claim 81, wherein ~~a user~~ the selected message model ~~is an instantiation for a particular user of said shared language model, an~~ includes user-specific acoustic model information[[,]] and ~~said~~ user-specific handwriting model information.

94-102. (Canceled)

103. (New) A method, comprising:

receiving, at a device, freehand input based at least in part on manipulation of a stylus;

receiving, at a device, audio input based at least in part on information received at a microphone;

selecting, via the device, a selected message model from a plurality of message models;

generating, by the device, converted handwriting text data based at least in part on the freehand input, a handwriting model, and the selected message model; and

generating, by the device, converted speech text data based at least in part on the audio input, an acoustic model, and the selected message model.

104. (New) The method according to claim 103, further comprising switching from receiving audio input to receiving freehand input in response to detecting movement of the stylus towards a tablet.

105. (New) The method according to claim 103, further comprising accessing at least one of the handwriting model, the acoustic model and the selected message model via a network.

106. (New) The method according to claim 103, further comprising training the selected message model.

107. (New) The method according to claim 103, further comprising training the acoustic model.

108. (New) The method according to claim 103, further comprising training the handwriting model.

109. (New) An article of manufacture including a tangible non-transitory computer-readable medium having stored thereon instructions executable by a computing device to cause the computing device to perform operations comprising:

receiving freehand input based at least in part on manipulation of a stylus;

receiving audio input based at least in part on information received at a microphone;

selecting a selected message model from a plurality of message models;

generating converted handwriting text data based at least in part on the freehand input and on a handwriting model;

generating converted speech text data based at least in part on the audio input and on an acoustic model; and

adjusting, using the selected message model, at least one of the converted handwriting text data and the converted speech text data.

110. (New) An apparatus, comprising:

means for receiving freehand input based at least in part on manipulation of a stylus;

means for receiving audio input based at least in part on audio information; and

means for selecting a selected message model from a plurality of message models;

wherein the apparatus is configured to:

generate converted handwriting text data based at least in part on the freehand input, a handwriting model, and the selected message model; and

generate converted speech text data based at least in part on the audio input, an acoustic model, and the selected message model.

REMARKS:

Claims 81-83 and 85-102 were pending in the application at the time of the Office Action. Claims 94-102 are canceled herein. Claims 81, 82, and 85-93 are amended. Claims 103-110 are added. Therefore, claims 81-83, 85-93, and 103-110 are now pending in this application.

Support for the present claim amendments can be found throughout the originally-filed specification, including at least the description of embodiments found at page 35, lines 3-11.

Statement of Substance of Interview

Applicant thanks the Examiner for extending the courtesy of conducting a telephone interview on January 28, 2011. Participating in the interview were Examiner Colucci and Applicant's undersigned representative. Applicant's proposed clarifying amendments were discussed in view of the cited references and the specification. The Examiner agreed that the discussed proposed amendments, which are similar to the amendments presented below, would overcome the prior art of record. No agreement was reached as to allowability, as the Examiner stated that a new search would be performed.

Section 103 Rejections

Claim 81 stands rejected under 35 U.S.C. § 103 as being unpatentable over Ditzik (U.S. Patent No. 6,167,376) in view of Bellegarda (U.S. Patent No. 6,285,785) and further in view of Kahn (U.S. Patent No. 6,122,614).

Applicant respectfully disagrees with the rejections. However, amendments are presented herein in an effort to bring the claims to issue more rapidly. For example, claim 81 is amended to recite in part as follows:

> adjust the text data generated from the freehand input based at least in part on a selected message model from a plurality of message models; and
>
> adjust the text data generated from the voice input based at least in part on the selected message model.

In rejecting the previously pending version of claim 81, the Office Action relies on the Kahn reference as allegedly teaching "that the context of the unmatched word can be selected by the operator to be shown ***within the sentence it resides, word by word or in phrase context***." *See* Office Action at 7 (emphasis added). The Office Action appears to interpret the "context" recited in the previously pending version of the claims as corresponding to the "context" described in the Kahn reference (e.g., the "word by word or in phrase" environment in which a word is used). The amendments to claim 81 presented herein further clarify distinctions between the claimed features and the cited references by clarifying that text data is "adjust[ed]" "based at least in part on a selected message model from a plurality of message models." Applicant submits that these "selected message model"-related features are not taught or suggested by the cited references.

Applicant notes that during the January 28 interview, the Examiner agreed that discussed proposed clarifying amendments, similar to those presented herein, overcome the art of record.

For at least the reasons discussed above, the proposed combination of references does not disclose or suggest all of the features of amended independent claim 81. Thus, the proposed combination cannot establish a *prima facie* of obviousness of independent claim 81 or the claims that depend therefrom. Accordingly, Applicant respectfully requests reconsideration and removal of the present rejections. Applicant submits that similar remarks also apply to new independent claims 103, 109, and 110, as well as the claims that depend therefrom, although these claims have different scope than claim 81.

CONCLUSION:

Applicant respectfully submits the application is in condition for allowance, and an early notice to that effect is requested.

If any extension of time (under 37 C.F.R. § 1.136) is necessary to prevent the above-referenced application from becoming abandoned, Applicant hereby petitions for such extension.

The Commissioner is authorized to charge any fees that may be required, or credit any overpayment, to Meyertons, Hood, Kivlin, Kowert & Goetzel, P.C. Deposit Account No. 501505/6257-33703/EBM.

Respectfully submitted,

Date: February 21, 2011

By: /Eric B. Min/
Eric B. Min
Reg. No. 54,761
Attorney for Applicant

Meyertons, Hood, Kivlin, Kowert & Goetzel, P.C.
P.O. Box 398
Austin, TX 78767-0398
(512) 853-8862

Electronic Acknowledgement Receipt	
EFS ID:	9486198
Application Number:	11088032
International Application Number:	
Confirmation Number:	6401
Title of Invention:	Message recognition using shared language model
First Named Inventor/Applicant Name:	Edwin A. Suominen
Customer Number:	35690
Filer:	Eric B. Min/Deena Beasley
Filer Authorized By:	Eric B. Min
Attorney Docket Number:	6257-33703
Receipt Date:	21-FEB-2011
Filing Date:	22-MAR-2005
Time Stamp:	16:37:31
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Response_to_OA_11_30_10.pdf	111022 7dd8308cf1d030017256f6d4c427d0f905868f60	yes	9

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	6
	Applicant Arguments/Remarks Made in an Amendment	7	9
Warnings:			
Information:			
	Total Files Size (in bytes):	111022	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 11/088,032	Filing Date 03/22/2005	☐ To be Mailed

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☐		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

		(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
AMENDMENT	02/21/2011	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 20	Minus	** 21	= 0	X $ =		OR	X $52=	0
	Independent (37 CFR 1.16(h))	* 4	Minus	***5	= 0	X $ =		OR	X $220=	0
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)					
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L 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.

Legal Instrument Examiner:
/DEBORAH POLLARD/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, 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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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/088,032	03/22/2005	Edwin A. Suominen	6257-33703	6401

35690 7590 02/08/2011

MEYERTONS, HOOD, KIVLIN, KOWERT & GOETZEL, P.C.
P.O. BOX 398
AUSTIN, TX 78767-0398

EXAMINER	
COLUCCI, MICHAEL C	
ART UNIT	PAPER NUMBER
2626	

NOTIFICATION DATE	DELIVERY MODE
02/08/2011	ELECTRONIC

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

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patent_docketing@intprop.com
ptomhkkg@gmail.com

Interview Summary	Application No.	Applicant(s)	
	11/088,032	SUOMINEN, EDWIN A.	
	Examiner	Art Unit	
	MICHAEL C. COLUCCI	2626	

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

(1) *MICHAEL C. COLUCCI*. (3)_____.

(2) *ERIC MIN 54761*. (4)_____.

Date of Interview: *28 January 2011*.

Type: a)☒ Telephonic b)☐ Video Conference
c)☐ Personal [copy given to: 1)☐ applicant 2)☐ applicant's representative]

Exhibit shown or demonstration conducted: d)☐ Yes e)☒ No.
If Yes, brief description: _____.

Claim(s) discussed: *81*.

Identification of prior art discussed: *ALL*.

Agreement with respect to the claims f)☒ was reached. g)☐ was not reached. h)☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: *An agreement was reached wherein proposed amendments to the claims narrow the scope of the claims and appear to overcome the prior art of record, however a new search and analysis of the claims and prior art must be conducted.*.

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

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN A NON-EXTENDABLE PERIOD OF THE LONGER OF ONE MONTH OR THIRTY DAYS FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

/Michael C Colucci/ Examiner, Art Unit 2626	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

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

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

———

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

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

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

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

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/088,032	03/22/2005	Edwin A. Suominen	6257-33703	6401

35690 7590 11/30/2010

MEYERTONS, HOOD, KIVLIN, KOWERT & GOETZEL, P.C.
P.O. BOX 398
AUSTIN, TX 78767-0398

EXAMINER	
COLUCCI, MICHAEL C	
ART UNIT	PAPER NUMBER
2626	

NOTIFICATION DATE	DELIVERY MODE
11/30/2010	ELECTRONIC

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

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patent_docketing@intprop.com
ptomhkkg@gmail.com

Office Action Summary	Application No.	Applicant(s)	
	11/088,032	SUOMINEN, EDWIN A.	
	Examiner	Art Unit	
	MICHAEL C. COLUCCI	2626	

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 July 2009*.

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

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

Disposition of Claims

4)☒ Claim(s) *81-83 and 85-102* is/are pending in the application.

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

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *81-83 and 85-102* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

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

Application Papers

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

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

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

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

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

Priority under 35 U.S.C. § 119

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

a)☐ All b)☐ Some * c)☐ None of:

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

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

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

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

Attachment(s)

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

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 01/22/2010 has been entered.

Response to Arguments

Applicants arguments with respect to claims 81-83 and 85-102 have been considered but are moot in view of the new grounds of rejection. Therefore Berman et al. US 5550930 A has been withdrawn and Kahn et al. US 6122614 A (hereinafter Kahn) incorporated. Examiner believes that amendments directed to “a present context based on words in the provided text data of the memory and

wherein the system is configured to improve the accuracy of the shared language model by detecting instances in which a word or text segment obtained from the speech or handwriting recognizer is not contained within the present context and to obtain user input indicative of a user context when a text segment of received user input is outside of the present context” appear to overcome the prior art of record.

Examiner believes that Berman teaches context but not necessarily user context of a word. It appears that Berman simply identifies out of context words based on *spelling* alone. Though Berman teaches spelling correction, the context is isolated to the spelling of a word, whereas Kahn teaches user interaction with respect to replacing misspelled words as well as words that are spelled 100% correct but strictly out of context. Further, Kahn teaches the ability of a user to replace an unmatched word with a user defined entry specific to what the user is thinking. Please see rejection below.

Claim Rejections - 35 USC § 103

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

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 81, 82, 85, 88, 89, 97, and 99-102 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ditzik US 6167376 A (hereinafter Ditzik) in view of Bellegarda et al. US 6285785 B1 (Bellegarda) and further in view of Kahn et al. US 6122614 A (hereinafter Kahn).

Re claims 81, 97, 99, 101, and 102, Ditzik teaches a system for generating text responsive to both voice and handwriting input, comprising:

(c) a tablet including (1) a tablet surface responsive to freehand input conveyed via manipulation of the stylus on or near the tablet surface to render ink-like indicia of the freehand input, and (3) a message recognizer including a speech recognizer and a handwriting recognizer (Col. 4 line 49 – Col. 5 line 2 & Fig. 2);

(d) wherein the speech recognizer is responsive to voice input conveyed via the microphone to provide text data in accordance with both a shared language model and an acoustic model (Col. 3 lines 49-64);

(e) the handwriting recognizer is responsive to freehand input conveyed via the stylus to provide text data (Col. 5 lines 38-67) in accordance with both the shared language model and a handwriting model, the shared language model having a context

However, Ditzik fails to teach a shared language model and an acoustic model (Bellegarda Col. 5 lines 15-25 & Fig. 2 items 26 and 54)

shared language model and a handwriting model (Bellegarda Col. 5 lines 15-25 & Fig. 2 items 24 and 54)

improving the accuracy of the writing and speech recognizer by training the shared language model by resolving text and speech input from said speech recognizer in accordance with text and speech input from said writing and speech recognizers

Bellegarda teaches a message recognition system 10 constructed and operated in accordance with a first embodiment of the invention. As employed herein a message is considered to be information generated by a human subject and entered into the system 10, the information being entered through an acoustic signal, a handwritten

stroke signal, or through a combination of acoustic and stroke signals. The information may represent individual characters, including numbers, letters of the alphabet, punctuation and the like. The information may also represent words, phrases, and paragraphs.

Additionally, Bellegarda teaches a feature vector that is a combination of FV.sub.S and FV.sub.H. The speech and handwriting feature vectors are each generated in response to simultaneously provided acoustic and handwriting input. In that the sampling rates and durations of the input are different for the speech and handwriting channels a normalization block 52 normalizes the two inputs to a common time base and combines the normalized feature vectors into a single feature vector. This combination may be a synthetic concatenation of the four dimensional handwriting vector with the 20 dimensional speech vector, as indicated in FIG. 4e, to provide a 24 dimensional combined vector (FV.sub.S,H). (Bellegarda Col. 10 line 57 – Col. 11 line 7).

Bellegarda also teaches that the foregoing and other problems are overcome and the objects of the invention are realized by method and apparatus that employs an integrated use of speech and handwriting recognition to improve an overall accuracy, in terms of throughput, of an automatic recognizer. The invention exploits complementarily acoustic and stroke information to provide method and apparatus having improved message recognition accuracy relative to either speech recognition or handwriting recognition alone (Bellegarda Col. 3 lines 53-61).

Further, Bellegarda teaches multi-dimensional vectors are employed to train the parameters of a set of combined word models, for a combined use of speech and

handwriting, or to train two sets of word models, for separate use during speech and handwriting recognition. During use, the probabilities, or likelihoods, of each input feature vector are computed using the appropriate set(s) of word models to generate a list or lists of candidate words. A candidate word is selected as representing a message based upon criteria including the probability score and, for the separate-use message recognition system, two weighting factors derived during training of the models (Bellegarda Col. 4 lines 15-25).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Ditzik to incorporate improving the accuracy of the writing and speech recognizer by training the shared language model by resolving text and speech input from said speech recognizer in accordance with text and speech input from said writing and speech recognizers as taught by Bellegarda to allow for an integrated use of speech and handwriting recognition to improve an overall accuracy, in terms of throughput, of an automatic recognizer, wherein the integration exploits a complementary use of acoustic and stroke information to provide method and apparatus having improved message recognition accuracy relative to either speech recognition or handwriting recognition alone (Bellegarda Col. 3 lines 53-61).

However, Ditzik in view of Bellegarda fails to teach a present context based on words in the provided text data of the memory

wherein the system is configured to improve the accuracy of the shared language model by detecting instances in which a word or text segment obtained from the speech

or handwriting recognizer is not contained within the present context and to obtain user input indicative of a user context when a text segment of received user input is outside of the present context

Kahn teaches that the context of the unmatched word can be selected by the operator to be shown within the sentence it resides, word by word or in phrase context, by clicking on buttons 514, 515, and 516, respectively. Associated with active window 501 is background window 502, which contains the copy of the written text file. As shown in background window 502, a incremental search has located (see pointer 503) the next occurrence of the current unmatched word "cash." Contemporaneously therewith, within window 505 containing the buffer from the speech recognition program, the same incremental search has located (see pointer 506) the next occurrence of the current unmatched word. A human user will likely only being viewing active window 501 activate the audio replay from the speech recognition program by clicking on "play" button 510, which plays the audio synchronized to the text at pointer 506. Based on that snippet of speech, which can be played over and over by clicking on the play button, the human user can manually input the correction to the current unmatched word via keyboard, mousing actions, or possibly even audible cues to another speech recognition program running within this window. In the present example, even if the choice of isolated context offered by buttons 514, 515 and 516, it may still be difficult to determine the correct verbatim word out-of-context, accordingly there is a switch window button 513 that will move background window 502 to the foreground with visible pointer 503 indicating the current location within the copy of the written text. The user

can then return to the active window and input the correct word, "trash." This change will only effect the copy of the written text displayed in background window 502 (continuing to “first” with possible user substitution with “worst” (KahnCol. 9 line 45 – Col. 10 line 28 & Fig. 5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Ditzik in view of Bellegarda to incorporate a present context based on words in the provided text data of the memory and wherein the system is configured to improve the accuracy of the shared language model by detecting instances in which a word or text segment obtained from the speech or handwriting recognizer is not contained within the present context and to obtain user input indicative of a user context when a text segment of received user input is outside of the present context as taught by Kahn to allow for resolving difficulties when determining the correct verbatim word out-of-context via a human user that can manually input the correction to the current unmatched word via keyboard, mousing actions, or possibly even audible cues to another speech recognition program running within this window, wherein a user can correct not only spelling errors (i.e. grammar) but also tailored vocabulary, such as in the instance where the context appears incorrect to a computer analysis but the user prefers otherwise given the structure of a sentence and not just within an isolated word (KahnCol. 9 line 45 – Col. 10 line 28).

Re claim 82, Ditzik teaches the system of claim 81 wherein the microphone is head mounted substantially beyond an immediate vicinity of the head of an individual interacting with the system (Col. 3 line 65 – Col. 4 line 17).

Re claim 85, Ditzik teaches the system of claim [[1]] 81 wherein:

(a) the speech recognizes recognizer provides text data without being responsive to freehand input supplied to the [[the]] handwriting recognizes recognizer (Fig. 1); and

(b) the handwriting recognizer provides text data without being responsive to voice input supplied to the [[the]] speech recognizer (Fig. 2)

Re claim 88, Ditzik teaches the system of claim 81, wherein at least one of said speech recognizer and said handwriting recognizer (Col. 5 lines 38-67, *pattern databases for stylus strokes*) is configured to be responsive to an identifying signal to select a particular user message model to use when generating text responsive to said voice input (Col. 3 lines 49-64 *phoneme models for speech input*).

Re claim 89, Ditzik teaches the system of claim 88, wherein said particular user message model is remotely available over a wide area network (Col. 8 lines 15-29).

Re claim 100, Ditzik teaches the method according to claim 99, further comprising accessing at least one of said shared language model, said acoustic model

and said writing model (Col. 4 line 49 – Col. 5 line 2 & Fig. 2) via a network (Col. 8 lines 15-29).

However, Ditzik fails to teach a shared language model

Bellegarda teaches a message recognition system 10 constructed and operated in accordance with a first embodiment of the invention. As employed herein a message is considered to be information generated by a human subject and entered into the system 10, the information being entered through an acoustic signal, a handwritten stroke signal, or through a combination of acoustic and stroke signals. The information may represent individual characters, including numbers, letters of the alphabet, punctuation and the like. The information may also represent words, phrases, and paragraphs.

Additionally, Bellegarda teaches a feature vector that is a combination of FV.sub.S and FV.sub.H. The speech and handwriting feature vectors are each generated in response to simultaneously provided acoustic and handwriting input. In that the sampling rates and durations of the input are different for the speech and handwriting channels a normalization block 52 normalizes the two inputs to a common time base and combines the normalized feature vectors into a single feature vector. This combination may be a synthetic concatenation of the four dimensional handwriting vector with the 20 dimensional speech vector, as indicated in FIG. 4e, to provide a 24 dimensional combined vector (FV.sub.S,H). (Bellegarda Col. 10 line 57 – Col. 11 line 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention accessing at least one of said shared language model, said

acoustic model and said writing model via a network for the purposes of hand writing and speech complementing one another, wherein difficult pronunciations or spelling error may occur (i.e. a user can override writing a long word by just uttering the word itself).

4. Claim 83 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ditzik US 6167376 A (hereinafter Ditzik) in view of Bellegarda et al. US 6285785 B1 (Bellegarda) and Kahn et al. US 6122614 A (hereinafter Kahn) and further in view of Watterson et al US 4969180 A (hereinafter Watterson).

Re claim 83, Ditzik in view of Bellegarda and Kahn fails to teach the system of claim 82 wherein the microphone is housed in the stylus

Watterson teaches a functional writing pen as a cordless handset incorporating a microphone and speaker unit, which can conveniently serve as both a pen and a telephone handset for normal telephone conversation (Watterson Col. 2 lines 11-20).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention a microphone housed in a stylus, wherein housing a microphone within a writing instrument such as a stylus or pen would allow for hands-free communication with a speech recognition system to provide a more convenient means for a user to input data through by handwriting and/or speech and not holding a microphone in addition to a stylus.

5. **Claims 86, 92, and 98 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ditzik US 6167376 A (hereinafter Ditzik) in view of Bellegarda et al. US 6285785 B1 (Bellegarda) and Kahn et al. US 6122614 A (hereinafter Kahn) and further in view of Shim et al. US 6853850 B2 (hereinafter Shim).**

Re claim 86, Ditzik in view of Bellegarda and Kahn fails to teach the system of claim 81, wherein said stylus is equipped with a proximity sensor that is configured to sense a proximity of a human head to said microphone

Shim teaches adjusting the speaker volume and/or the microphone gain to provide optimum audio signal levels for that situation. If the estimated sensor-head distance is greater than the reference distance, the system (1) adjusts the speaker volume and/or the microphone gain to its maximum signal level and/or (2) notifies the user that the maximum signal level may be inadequate to maintain acceptable audio communication and/or (3) disables the speaker and/or the microphone until the sensor-head distance is no greater than the reference distance or (4) takes no action. More than one proximity zone, each with its own reference distance and/or zone center, can be defined and sensed by the system. The minimum-to-maximum range for speaker volume and/or for microphone gain is adjustable for each user (Shim Col. 1 line 67 – Col. 2 line 22).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention stylus is equipped with a proximity sensor that is configured to sense a proximity of a human head to said microphone for the purposes of adjusting

gain from a user, wherein ideal audio levels can be input into the processor for accurate speech recognition, wherein a minimum and maximum distance from the microphone can be implemented to establish thresholds.

Re claims 92 and 98, Ditzik in view of Bellegarda and Kahn fails to teach the system of claim 81, further comprising an activation circuit that is configured to sense when a user moves said stylus away from said user's mouth and toward said tablet in order to configure said tablet for editing

Shim teaches adjusting the speaker volume and/or the microphone gain to provide optimum audio signal levels for that situation. If the estimated sensor-head distance is greater than the reference distance, the system (1) adjusts the speaker volume and/or the microphone gain to its maximum signal level and/or (2) notifies the user that the maximum signal level may be inadequate to maintain acceptable audio communication and/or (3) disables the speaker and/or the microphone until the sensor-head distance is no greater than the reference distance or (4) takes no action. More than one proximity zone, each with its own reference distance and/or zone center, can be defined and sensed by the system. The minimum-to-maximum range for speaker volume and/or for microphone gain is adjustable for each user (Shim Col. 1 line 67 – Col. 2 line 22).

If the microphone is housed within the stylus, then various zones can be implemented to measure the distance a person is from a microphone (i.e. stylus with microphone housed in it), wherein if the stylus is at a certain distance from the user,

then the handwriting recognition system will be expecting the user to begin writing, and the speech recognition system will not.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention stylus is equipped with a proximity sensor that is configured to sense a proximity of a human head to said microphone for the purposes of adjusting gain from a user, wherein ideal audio levels can be input into the processor for accurate speech recognition, wherein a minimum and maximum distance from the microphone can be implemented to establish thresholds that can identify when the stylus is at a certain distance from the user for the handwriting recognition system to begin expecting the user to begin writing.

6. **Claims 87 and 93-96 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ditzik US 6167376 A (hereinafter Ditzik) in view of Bellegarda et al. US 6285785 B1 (Bellegarda) and Kahn et al. US 6122614 A (hereinafter Kahn) and further in view of Black US 6307956 B1 (hereinafter Black).**

Re claim 87, Ditzik in view of Bellegarda and Kahn fails to teach the system of claim 81, wherein said stylus is equipped with an identification circuit that is configured to identify an owner of said stylus

Black teaches a stylus 15 includes one or more sensors 20 that capture biometric properties of the user. The computer (chip) 40 processes the captured information to determine whether to enable access to an account/network/entry, or other entry or

privilege once identification has been confirmed. In one preferred embodiment, the system includes means to enable the user to enter a primary identifier, the identifier being a series of letters, digits, a spoken word converted to text (speech recognition), or the like. The primary identifier is preferably the user's printed name, the user's birthday (and year), zip code, mother's maiden name, or PIN or password. (Black Col. 10 line 28-39 & Fig. 1)

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention stylus is equipped with an identification circuit that is configured to identify an owner of said stylus for the purposes of preventing an unknown user from accessing specific user-trained models/databases, wherein information specific to a user must be input prior to operation speech and/or handwriting operations.

Re claim 93, Ditzik teaches the system of claim 81, wherein a user message model is an instantiation for a particular user of said shared language model, said acoustic model, and said handwriting model (Col. 3 lines 49-64).

However, Ditzik fails to teach a shared language model

Bellegarda teaches a message recognition system 10 constructed and operated in accordance with a first embodiment of the invention. As employed herein a message is considered to be information generated by a human subject and entered into the system 10, the information being entered through an acoustic signal, a handwritten stroke signal, or through a combination of acoustic and stroke signals. The information may represent individual characters, including numbers, letters of the alphabet,

punctuation and the like. The information may also represent words, phrases, and paragraphs.

Additionally, Bellegarda teaches a feature vector that is a combination of FV.sub.S and FV.sub.H. The speech and handwriting feature vectors are each generated in response to simultaneously provided acoustic and handwriting input. In that the sampling rates and durations of the input are different for the speech and handwriting channels a normalization block 52 normalizes the two inputs to a common time base and combines the normalized feature vectors into a single feature vector. This combination may be a synthetic concatenation of the four dimensional handwriting vector with the 20 dimensional speech vector, as indicated in FIG. 4e, to provide a 24 dimensional combined vector (FV.sub.S,H). (Bellegarda Col. 10 line 57 – Col. 11 line 7).

However, Ditzik in view of Bellegarda and Kahn fails to teach a user message model is an instantiation for a particular user

Black teaches a stylus 15 includes one or more sensors 20 that capture biometric properties of the user. The computer (chip) 40 processes the captured information to determine whether to enable access to an account/network/entry, or other entry or privilege once identification has been confirmed. In one preferred embodiment, the system includes means to enable the user to enter a primary identifier, the identifier being a series of letters, digits, a spoken word converted to text (speech recognition), or the like. The primary identifier is preferably the user's printed name, the user's birthday (and year), zip code, mother's maiden name, or PIN or password. (Black Col. 10 line 28-39 & Fig. 1)

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention a user message model is an instantiation for a particular user of said shared language model, said acoustic model, and said handwriting model for the purposes of hand writing and speech complementing one another, wherein difficult pronunciations or spelling error may occur (i.e. a user can override writing a long word by just uttering the word itself). Additionally, it would have been obvious to one of ordinary skill in the art at the time of the invention a user message model is an instantiation for a particular user for the purposes of preventing an unknown user from accessing specific user-trained models/databases, wherein information specific to a user must be input prior to operation speech and/or handwriting operations.

Re claim 94, Ditzik teaches the system of claim 93, wherein said user message model is local to said system (Col. 3 line 65 – Col. 4 line 17).

Re claim 95, Ditzik teaches the system of claim 94, wherein said user message model is implemented in a virtual machine (Col. 6 lines 32-58).

Re claim 96, Ditzik teaches the system of claim 93, wherein said user message model is remotely stored in a database (Col. 3 line 65 – Col. 4 line 17)

7. **Claims 90 and 91 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ditzik US 6167376 A (hereinafter Ditzik) in view of Bellegarda et al. US 6285785 B1 (Bellegarda) and Kahn et al. US 6122614 A (hereinafter Kahn) and further in view of Bellegarda US 5839106 A (hereinafter Bellegarda(2)).**

Re claim 90, Ditzik fails to teach the system of claim 81, further comprising a unified message model that includes said acoustic model, said handwriting model, and said shared language model, wherein said shared language model (Bellegarda Col. 5 lines 15-25 & Fig. 2 items 24 and 54) includes a syntactic model and a semantic model

Bellegarda teaches a message recognition system 10 constructed and operated in accordance with a first embodiment of the invention. As employed herein a message is considered to be information generated by a human subject and entered into the system 10, the information being entered through an acoustic signal, a handwritten stroke signal, or through a combination of acoustic and stroke signals. The information may represent individual characters, including numbers, letters of the alphabet, punctuation and the like. The information may also represent words, phrases, and paragraphs.

Additionally, Bellegarda teaches a feature vector that is a combination of FV.sub.S and FV.sub.H. The speech and handwriting feature vectors are each generated in response to simultaneously provided acoustic and handwriting input. In that the sampling rates and durations of the input are different for the speech and handwriting channels a normalization block 52 normalizes the two inputs to a common time base and combines the normalized feature vectors into a single feature vector.

This combination may be a synthetic concatenation of the four dimensional handwriting vector with the 20 dimensional speech vector, as indicated in FIG. 4e, to provide a 24 dimensional combined vector (FV.sub.S,H). (Bellegarda Col. 10 line 57 – Col. 11 line 7).

However, Ditzik in view of Bellegarda and Kahn fails to teach a syntactic model and a semantic model

Bellegarda(2) teaches a hybrid recognition processor 220 might use an n-gram syntactic-type first model 310 to produce a list of candidate text messages from a sequence of feature vectors, and then employ a latent semantic-type second model 320 to rescore the list so that the most likely candidate, or hypothesis, is moved to the top of the list as necessary (Bellegarda(2) Col. 6 lines 51-67). Of course, such a sequential approach to integration will fail if the correct hypothesis is not included in the original list of candidates produced during the first recognition pass. Such failure may be prevented, however, by producing a relatively long list of candidates during the first pass, so that the original list is virtually guaranteed to include the correct hypothesis.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention a unified message model that includes said acoustic model, said handwriting model, and said shared language model, wherein said shared language model includes a syntactic model and a semantic model for the purposes of hand writing and speech complementing one another, wherein difficult pronunciations or spelling error may occur (i.e. a user can override writing a long word by just uttering the word itself). Additionally, it would have been obvious to one of ordinary skill in the art at the time of the invention a semantic and syntactic model for the purposes of further

correcting a ranked list of potential candidates by analyzing the context and grammar rules for a language to receive speech or handwriting, wherein the best candidate can be selected to be generated as text while conserving memory resources.

Re claim 91, Ditzik in view of Bellegarda and Kahn fails to teach the system of claim 90, wherein said semantic model comprises at least one of:

(a) a semantic cluster of a first type that is a mathematically derived group of vectors representing text segments (Bellegarda(2) Col. 6 lines 51-67);

(b) a semantic cluster of a second type that is a discrete grouping of text that has a particular context; and

(c) a semantic cluster of a third type that is defined with respect to an individual reference word that is considered to be indicative of a particular context.

Bellegarda(2) teaches a hybrid recognition processor 220 might use an n-gram syntactic-type first model 310 to produce a list of candidate text messages from a sequence of feature vectors, and then employ a latent semantic-type second model 320 to rescore the list so that the most likely candidate, or hypothesis, is moved to the top of the list as necessary (Bellegarda(2) Col. 6 lines 51-67). Of course, such a sequential approach to integration will fail if the correct hypothesis is not included in the original list of candidates produced during the first recognition pass. Such failure may be prevented, however, by producing a relatively long list of candidates during the first pass, so that the original list is virtually guaranteed to include the correct hypothesis.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention a semantic cluster of a first type that is a mathematically derived group of vectors representing text segments for the purposes of further correcting a ranked list of potential candidates by analyzing the context and grammar rules for a language to receive speech or handwriting, wherein the best candidate can be selected to be generated as text while conserving memory resources.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL C. COLUCCI whose telephone number is (571)270-1847. The examiner can normally be reached on 8:30 am - 5:00 pm , Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571)-272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael C Colucci/
Examiner, Art Unit 2626
Patent Examiner
AU 2626
(571)-270-1847
Examiner FAX: (571)-270-2847
Michael.Colucci@uspto.gov

Notice of References Cited	Application/Control No. 11/088,032	Applicant(s)/Patent Under Reexamination SUOMINEN, EDWIN A.	
	Examiner MICHAEL C. COLUCCI	Art Unit 2626	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,122,614 A	09-2000	Kahn et al.	704/235
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

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

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

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L6	1320	user$2 same (edit select$4 modif$6 choose indicat $5) same context$5 same word$4 same input$4	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2010/11/12 13:11
L7	57	user$2 same (edit select$4 modif$6 choose indicat $5) same context$5 same word$4 same input$4 same (outside ("out of"))	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2010/11/12 13:15
L8	1320	user$2 same (edit select$4 modif$6 choose indicat $5) same context$5 same word$4 same input$4	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2010/11/12 13:20
L9	21120	("704").CLAS.	USPAT; USOCR; EPO	OR	OFF	2010/11/12 13:20
L10	155	9 and 8	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2010/11/12 13:20
L11	89	10 and (context $5 with (within outside out $3correct$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2010/11/12 13:21
L12	46	10 and (context $5 with (within outside out $3correct$4) with user)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2010/11/12 13:23

L13	46	10 and (context $5 with (within outside out $3correct$4 "out-of-context" "out of context") with user)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2010/11/12 13:31
L14	43	10 and (context $5 with (within outside $3correct$4 "out-of-context" "out of context") with user)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2010/11/12 13:31
L15	23	10 and (context $5 with (outside $3correct$4 "out-of-context" "out of context") with user)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2010/11/12 13:31
L16	0	10 and (("out-of-context" "out of context") with user)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2010/11/12 13:39
L17	2	8 and (("out-of-context" "out of context") with user with word$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2010/11/12 13:40
L18	2	8 and (("out-of-context" "out of context") with user)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2010/11/12 13:41
L19	12	8 and (("out-of-context" "out of context"))	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2010/11/12 13:41
L20	12	19 and context $6	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2010/11/12 13:52
L21	9	19 and context $6 and document$4	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2010/11/12 13:52

L23	577	(704/235). CCLS.	USPAT; USOCR; EPO	OR	OFF	2010/11/12 15:43
L25	56	23 and handwrit$6	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2010/11/12 15:45

11/12/2010 4:00:08 PM
H:\East\Workspaces\11088032.wsp

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11088032	SUOMINEN, EDWIN A.
	Examiner	Art Unit
	Colucci, Michael C	2626

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/05/2007	06/04/2008	11/07/2008	04/16/2009	10/20/2009	11/12/2010			
	81	✓	✓	✓	✓	✓	✓			
	82	✓	✓	✓	✓	✓	✓			
	83	✓	✓	✓	✓	✓	✓			
	84	✓	✓	-	-	-	-			
	85	✓	✓	✓	✓	✓	✓			
	86		✓	✓	✓	✓	✓			
	87		✓	✓	✓	✓	✓			
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	100		✓	✓	✓	✓	✓			
	101			✓	✓	✓	✓			
	102			✓	✓	✓	✓			

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11088032	SUOMINEN, EDWIN A.
	Examiner	Art Unit
	Colucci, Michael C	2626

SEARCHED

Class	Subclass	Date	Examiner
382	187	11/5/2007	MC
704	256, 270	11/5/2007	MC
704	235, 257	6/4/2008	MC
379	56.1	6/4/2008	MC
382	124, 187	6/4/2008	MC
455	550.1	6/4/2008	MC
704	257	4/16/2009	MC
382	187	10/20/2009	MC
704	235	11/12/2010	MC

SEARCH NOTES

Search Notes	Date	Examiner
Searched 382/187 with keyword limitations	11/5/2007	MC
Searched 704/256 with keyword limitations	11/5/2007	MC
Searched 704/270 with keyword limitations	11/5/2007	MC
Consulted SPE Richemond Dorvil	11/5/2007	MC
Searched 704/235 with keyword limitations	6/4/2008	MC
Searched 704/257 with keyword limitations	6/4/2008	MC
Searched 379/56.1 with keyword limitations	6/4/2008	MC
Searched 382/124 with keyword limitations	6/4/2008	MC
Searched 455/550.1 with keyword limitations	6/4/2008	MC
Searched 382/187 with keyword limitations	6/4/2008	MC
Performed a double patenting search	5/27/2008	MC
Performed an inventors search	5/27/2008	MC
Consulted SPE Richemond Dorvil	5/27/2008	MC
Consulted Primary Examiner Talivaldis Smits	5/27/2008	MC
Checked the spec. for "medium" - not a signal	11/7/2008	MC
Searched 704/257 with keyword limitations	4/16/2009	MC
Searched 382/187 with keyword limitations	10/20/2009	MC
Searched 704/235 with keyword limitations	11/12/2010	MC
rechecked CRM claims - ok - magnetic medium [0016]	11/12/2010	MC
checked system claims - ok - computer memory and stylus tablet	11/12/2010	MC
checked method claims - ok - computer memory on device	11/12/2010	MC
checked apparatus claims - ok - computer memory within apparatus	11/12/2010	MC

INTERFERENCE SEARCH			
Class	**Subclass**	**Date**	**Examiner**

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/088,032	03/22/2005	Edwin A. Suominen	**OR-0005

CONFIRMATION NO. 6401

23377
WOODCOCK WASHBURN LLP
CIRA CENTRE, 12TH FLOOR
2929 ARCH STREET
PHILADELPHIA, PA 19104-2891

POWER OF ATTORNEY NOTICE

OC000000044017453

Date Mailed: 10/18/2010

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 10/08/2010.

- 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).

/sleutchit/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/088,032	03/22/2005	Edwin A. Suominen	**OR-0005

CONFIRMATION NO. 6401

35690
MEYERTONS, HOOD, KIVLIN, KOWERT & GOETZEL, P.C.
P.O. BOX 398
AUSTIN, TX 78767-0398

POA ACCEPTANCE LETTER

OC000000044017483

Date Mailed: 10/18/2010

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 10/08/2010.

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.

/sleutchit/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

PTO/SB/80 (01-06)
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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: 35690

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: 35690

OR

☐ Firm or Individual Name			
Address			
City		State	Zip
Country			
Telephone		Email	

Assignee Name and Address:

Optical Research Partners LLC
2215-B Renaissance Drive, Suite 5
Las Vegas, NV 89119

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

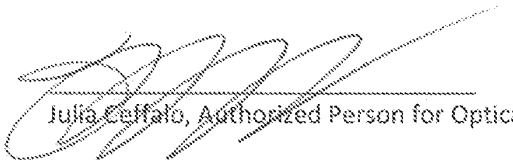
Signature		Date	27 SEP 2006
Name	Julia Ceffalo	Telephone	
Title	Authorized Person for Optical Research Partners LLC		

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.

DECLARATION REGARDING AUTHORITY TO SIGN ON BEHALF OF A LEGAL ENTITY
37 C.F.R. 3.73(b)(2)(i)

I, Julia Ceffalo (whose title is supplied below), hereby declare that I am authorized to sign on behalf of Optical Research Partners LLC.



Julia Ceffalo, Authorized Person for Optical Research Partners LLC

27 SEP 2010

[date]

PTO/SB/96 (08-08)
Approved for use through 08/31/2008. OMB 0651-0031
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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.

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Optical Research Partners LLC

Application No./Patent No.: 11/088032 Filed/Issue Date: 3/22/2005

Entitled: MESSAGE RECOGNITION USING SHARED LANGUAGE MODEL

Optical Research Partners LLC, a Limited Liability Company
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☑ the assignee of the entire right, title, and interest; 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 for which a copy thereof 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: Edwin A. Suominen To: MOUNT HAMILTON PARTNERS, LLC
The document was recorded in the United States Patent and Trademark Office at
Reel 016010, Frame 0010, or for which a copy thereof is attached.

2. From: MOUNT HAMILTON PARTNERS, LLC To: OPTICAL RESEARCH PARTNERS LLC
The document was recorded in the United States Patent and Trademark Office at
Reel 016202, Frame 0961, 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.

Signature	10/8/2010 (6257-33704) Date
Dean M. Munyon	512-853-8800
Printed or Typed Name	Telephone Number
Attorney (Reg. No.: 42,914)	
Title	

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt	
EFS ID:	8594209
Application Number:	11088032
International Application Number:	
Confirmation Number:	6401
Title of Invention:	Message recognition using shared language model
First Named Inventor/Applicant Name:	Edwin A. Suominen
Customer Number:	23377
Filer:	Dean M. Munyon/Christine Acker
Filer Authorized By:	Dean M. Munyon
Attorney Docket Number:	**OR-0005
Receipt Date:	08-OCT-2010
Filing Date:	22-MAR-2005
Time Stamp:	18:21:45
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	Tablet_PC_PoA_DRATS.pdf	1018788 08355b36a43821d9e4679336db4d79b205e7a3c1	no	2

Warnings:
Information:

2	Assignee showing of ownership per 37 CFR 3.73(b).	statement.pdf	62718 6ea869a81bd31e31eba57c193686c09e23ea5f0f	no	1
Warnings:					
Information:					
			Total Files Size (in bytes):	1081506	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	11/088,032	Filing Date	2005-03-22	Docket Number (if applicable)	**OR-0005	Art Unit	2626
First Named Inventor	Edwin A. Suominen			Examiner Name	Michael C. Colucci		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☒ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

☒ Other Response filed December 22, 2009.

☐ Enclosed

☐ Amendment/Reply

☐ Information Disclosure Statement (IDS)

☐ Affidavit(s)/ Declaration(s)

☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____
(Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

☒ **The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.**
The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 233050

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Signature of Registered U.S. Patent Practitioner			
Signature	/Peter Trahms-Neudorfer/	Date (YYYY-MM-DD)	2010-01-22
Name	Peter Trahms-Neudorfer	Registration Number	59282

This collection of information is required by 37 CFR 1.114. 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.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal	
Application Number:	11088032
Filing Date:	22-Mar-2005
Title of Invention:	Message recognition using shared language model
First Named Inventor/Applicant Name:	Edwin A. Suominen
Filer:	Peter Trahms-Neudorfer/Selina Gillespie
Attorney Docket Number:	**OR-0005
Filed as Large Entity	

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Request for continued examination	1801	1	810	810
		Total in USD ($)		**810**

Electronic Acknowledgement Receipt	
EFS ID:	6866658
Application Number:	11088032
International Application Number:	
Confirmation Number:	6401
Title of Invention:	Message recognition using shared language model
First Named Inventor/Applicant Name:	Edwin A. Suominen
Customer Number:	23377
Filer:	Peter Trahms-Neudorfer/Selina Gillespie
Filer Authorized By:	Peter Trahms-Neudorfer
Attorney Docket Number:	**OR-0005
Receipt Date:	22-JAN-2010
Filing Date:	22-MAR-2005
Time Stamp:	17:31:21
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$810
RAM confirmation Number	5666
Deposit Account	233050
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Continued Examination (RCE)	RCE.pdf	769322 b5595f4ebc31ea2a9a5ea4e714d4eae9cd60f5f0	no	3
Warnings:					
Information:					
2	Fee Worksheet (PTO-875)	fee-info.pdf	30012 51f037fa29dbdf18accd9195b9274badcc841b8a	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	799334		

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/088,032	03/22/2005	Edwin A. Suominen	**OR-0005	6401

23377 7590 12/30/2009

WOODCOCK WASHBURN LLP
CIRA CENTRE, 12TH FLOOR
2929 ARCH STREET
PHILADELPHIA, PA 19104-2891

EXAMINER	
COLUCCI, MICHAEL C	
ART UNIT	**PAPER NUMBER**
2626	

MAIL DATE	DELIVERY MODE
12/30/2009	PAPER

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

The time period for reply, if any, is set in the attached communication.

Advisory Action Before the Filing of an Appeal Brief	**Application No.** 11/088,032	**Applicant(s)** SUOMINEN, EDWIN A.	
	Examiner MICHAEL C. COLUCCI	**Art Unit** 2626	

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

THE REPLY FILED 22 December 2009 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☒ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:
   a) ☐ The period for reply expires _____months from the mailing date of the final rejection.
   b) ☒ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.
   Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☒ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   (a) ☒ They raise new issues that would require further consideration and/or search (see NOTE below);
   (b) ☐ They raise the issue of new matter (see NOTE below);
   (c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   (d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.
   NOTE: *See Continuation Sheet*. (See 37 CFR 1.116 and 41.33(a)).
4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicant's reply has overcome the following rejection(s): _____.
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☐ For purposes of appeal, the proposed amendment(s): a) ☐ will not be entered, or b) ☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.
   The status of the claim(s) is (or will be) as follows:
   Claim(s) allowed: _____.
   Claim(s) objected to: _____.
   Claim(s) rejected: _____.
   Claim(s) withdrawn from consideration: _____.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing a good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

11. ☐ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: _____.
12. ☐ Note the attached Information *Disclosure Statement*(s). (PTO/SB/08) Paper No(s). _____
13. ☐ Other: _____.

/Richemond Dorvil/
Supervisory Patent Examiner, Art Unit 2626

/Michael C Colucci/
Examiner, Art Unit 2626

Continuation of 3. NOTE:

Amendments related to distinguishing a user context and a shared language model having a present context based on words in the provided text data of the memory alone is believed to narrow the scope of the claims.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: **Edwin A. Suominen**	Confirmation No.: **6401**
Application No.: **11/088,032**	Group Art Unit: **2626**
Filing Date: **March 22, 2005**	Examiner: **Michael C. Colucci**

For: **MESSAGE RECOGNITION USING SHARED LANGUAGE MODEL**

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

Sir:

REPLY PURSUANT TO 37 CFR § 1.116

In response to the Official Action dated **October 22, 2009**, reconsideration is respectfully requested in view of the amendments and/or remarks as indicated below:

☐ **Amendments to the Specification** begin on page of this paper.

☒ **Amendments to the Claims** are reflected in the listing of the claims which begins on page 2 of this paper.

☐ **Amendments to the Drawings** begin on page of this paper and include an attached replacement sheet.

☒ **Remarks** begin on page 8 of this paper.

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

Listing of Claims:

1-80. (canceled)

81. (currently amended) A system for generating text responsive to both voice and handwriting input, comprising:

a tablet including a tablet surface responsive to freehand input conveyed via manipulation of a stylus on or near the tablet surface to render ink-like indicia of the freehand input, and a message recognizer including a speech recognizer and a handwriting recognizer;

wherein the speech recognizer is responsive to voice input conveyed via a microphone to provide text data of a memory in accordance with both a shared language model, the shared language model having:

a present context based on words in the provided text data of the memory, and

an acoustic model;

wherein the system is configured to improve the accuracy of the shared language model by detecting instances in which a word or text segment obtained from the speech or handwriting recognizer is not contained within the present context and to obtain user input indicative of a ~~selected current~~ user context when a text segment of received user input is outside of the present context; and

wherein the handwriting recognizer is responsive to freehand input conveyed via the stylus to provide text data in accordance with both the shared language model and a handwriting model.

82. (currently amended) The system of claim 81 wherein the microphone is mounted substantially beyond an immediate vicinity of the head of an individual interacting with the system.

83. (previously presented) The system of claim 82 wherein the microphone is housed in the stylus.

84. (Cancelled)

85. (previously presented) The system of claim 81 wherein:

the speech recognizer provides text data without being responsive to freehand input supplied to the handwriting recognizer; and

the handwriting recognizer provides text data without being responsive to voice input supplied to the speech recognizer.

86. (previously presented) The system of claim 81, wherein said stylus is equipped with a proximity sensor that is configured to sense a proximity of a human head to said microphone.

87. (previously presented) The system of claim 81, wherein said stylus is equipped with an identification circuit that is configured to identify an owner of said stylus.

88. (previously presented) The system of claim 81, wherein at least one of said speech recognizer and said handwriting recognizer is configured to be responsive to an identifying signal to select a particular user message model to use when generating text responsive to said voice input.

89. (previously presented) The system of claim 88, wherein said particular user message model is remotely available over a wide area network.

90. (previously presented) The system of claim 81, further comprising a unified message model that includes an acoustic model, said handwriting model, and said shared language model, wherein said shared language model includes a syntactic model and a semantic model.

91. (previously presented) The system of claim 90, wherein said semantic model comprises at least one of:

a semantic cluster of a first type that is a mathematically derived group of vectors representing text segments;

a semantic cluster of a second type that is a discrete grouping of text that has a particular context; and

a semantic cluster of a third type that is defined with respect to an individual reference word that is considered to be indicative of a particular context.

92. (previously presented) The system of claim 81, further comprising an activation circuit that is configured to sense when a user moves said stylus away from said user's mouth and toward said tablet in order to configure said tablet for editing.

93. (previously presented) The system of claim 81, wherein a user message model is an instantiation for a particular user of said shared language model, an acoustic model, and said handwriting model.

94. (previously presented) The system of claim 93, wherein said user message model is local to said system.

95. (previously presented) The system of claim 94, wherein said user message model is implemented in a virtual machine.

96. (previously presented) The system of claim 93, wherein said user message model is remotely stored in a database.

97. (currently amended) A method for generating, by a device comprising a processor, a display, a pressure sensitive region, a speech recognizer that converts audio to text, and a handwriting recognizer that converts handwriting to text, text responsive to both voice and handwriting input, comprising:

processing, by the device, with said speech recognizer voice input conveyed via a microphone to provide first text data <u>of a memory</u> in accordance with both a shared language model, <u>the shared language model having:</u>

<u>a present context based on words in the provided text data of the memory,</u>

and

an acoustic model;

determining, by the device, when a word of the voice input is outside of [[a]] the present context;

providing, by the device, a plurality of possible contexts for the word;

processing, by the device, with said handwriting recognizer, hand input conveyed via a stylus to provide ~~a the~~ a user context for the word of the plurality of possible contexts in accordance with both the shared language model and a handwriting model;

generating, by the device, second text data based on a combination of said speech recognizer processing and said handwriting recognizer processing; and

improving, by the device, the accuracy of said handwriting recognizer by training the handwriting recognizer in response to user correction by the speech recognizer.

98. (previously presented) The method according to claim 97, further comprising switching modes from processing input with said speech recognizer to processing input with said handwriting recognizer when said stylus moves away from a user's mouth and towards a tablet.

99. (currently amended) A method for receiving and processing a plurality of different types of input and converting said inputs into text data, comprising:

receiving, by electronics, voice input, wherein said voice input is conveyed via a stylus mounted microphone;

responding, by the electronics, to said voice input with a speech recognizer, wherein said speech recognizer is configured to provide text data of a memory in accordance with both a shared language model, the shared language model having:

a present context based on words in the provided text data of the memory, and

an acoustic model;

determining, by the electronics, that ~~the context of~~ a word of [[said]] the voice input is likely to be outside of the present context ~~ambiguous~~;

determining, by the electronics, a plurality of available contexts for the word;

receiving, by the electronics, writing input, wherein said writing input is indicative of [[the]] a user context for the word, the user context being one of the available contexts;

responding, by the electronics, to said writing input with a writing recognizer, wherein said writing recognizer is configured to provide text data in accordance with both the shared language model and a writing model;

improving, by the electronics, the accuracy of the speech recognizer by training the shared language model by resolving text input from said writing recognizer in accordance with text input from said speech recognizer.

100. (previously presented) The method according to claim 99, further comprising accessing at least one of said shared language model, said acoustic model and said writing model via a network.

101. (currently amended) A tangible computer-readable medium, having instructions stored thereon, the instructions comprising:

instructions for receiving writing input;

instructions for responding to said voice input with a speech recognizer, wherein said speech recognizer is configured to provide text data of a memory in accordance with both a shared language model, the shared language model having:

a present context based on words in the provided text data of the memory, and

an acoustic model;

instructions for determining that ~~the context of~~ a word of [[said]] the voice input is likely to be outside of the present context ~~ambiguous~~;

instructions for providing a plurality of possible contexts for the word;

instructions for receiving writing input, wherein said writing input is indicative of a user context for the word, the user context being one of the possible contexts;

instructions for responding to said writing input with a writing recognizer, wherein said writing recognizer is configured to provide text data in accordance with both the shared language model and a writing model; and

instructions for increasing the accuracy of the speech recognizer by training the shared language model by resolving text input from said writing recognizer in accordance with text input from said speech recognizer.

102. (currently amended) An apparatus for generating text responsive to both voice and handwriting input, comprising:

means for receiving writing input;

means for responding to said voice input with a speech recognizer, wherein said speech recognizer is configured to provide text data of a memory in accordance with both a shared language model, the shared language model having:

a present context based on words in the provided text data of the memory, and

an acoustic model;

means for determining that ~~the context of~~ a word of [[said]] the voice input is likely to be outside of the present context ~~ambiguous~~;

means for providing a plurality of possible contexts for the word;

means for receiving writing input, wherein said writing input is indicative of [[the]] a user context for the word, the user context being one of the possible contexts;

means for responding to said writing input with a writing recognizer, wherein said writing recognizer is configured to provide text data in accordance with both the shared language model and a writing model; and

means for increasing the accuracy of the speech recognizer by training the shared language model by resolving text input from said writing recognizer in accordance with text input from said speech recognizer.

REMARKS

Telephonic Examiner Interview

Examiner Colucci and the undersigned conducted a telephonic interview on December 3, 2009. Claim 81 was discussed. Examiner Colucci indicated that the present claim amendments and remarks would define over the Berman reference used in the present claim rejections under 35 USC §103. Applicants thank examiner for the interview, and wish to note that applicants' representative is readily available for further discussion at (206) 903-2467.

Claim Rejections – 35 USC § 103

Claims 81, 82, 85, 88, 89, 97 and 99-102 stand rejected under 35 USC 103(a) as being unpatentable over Ditzik (Pat. No. 6,167,376) in view of Bellegarda et al. (Pat. No. 6,285,785, hereinafter "Bellegarda") and further in view of Berman et al. (Pat. No. 5,550,930, hereinafter "Berman").

Claim 81, recites, in part, "wherein the system is configured to improve the accuracy of the shared language model by detecting instances in which a word or text segment obtained from the speech or handwriting recognizer is not contained within the context and to obtain user input indicative of a selected current context when a text segment of received user input is outside of the context." Examiner states that this recitation is taught by Berman at col. 5, lines 26-51, and Figs. 1A-1F.

Applicants have amended claim 81 to clarify its recitation of "context": "wherein the speech recognizer is responsive to voice input conveyed via a microphone to provide text data of a memory in accordance with both a shared language model, the shared language model having a present context based on words in the provided text data of the memory, and an acoustic model." Support for this language is found in at least paragraphs [0154]-[0155] of the specification. In contrast, as "context" is used by Berman, a single word has a context:

> The methods also support context training. For example, if the handwritten characters "and" are misrecognized as "aud," the user may decide that the handwritten "n" when taken out of

> context could be a "u" or an "n." However, the user knows that when the handwritten "n" is *within the context of the word* "and" it should always be recognized as an "n." The methods allow the user to select the "aud" in the character boxes. The methods then display the handwritten "and" in the train box. The user enters "and" in the correction box. Thus, the recognizer is trained to recognize the handwritten "and" as the word "and" without recognition of the individual characters.

Berman, col. 5, lines 41-51 (emphasis added).

Berman does not fairly teach, suggest, or disclose this newly amended language. This is so both because Berman appears not to teach, suggest, or disclose a "shared language model" on its own or a "shared language model having a present context based on words in the provided text data of the memory," and because Berman uses "context" to refer to the recognition of handwritten character(s) within the context of other handwritten character(s) in the same word. Using the above "and"/"aud" example, Bergman's context for the misrecognized "n" character is limited to the "a" and "d" that share the word "and" with the "n," so the example does not cover the context of a shared language model.

In view of these remarks, applicant respectfully submits that Ditzik in view of Bellegarda and further in view of Bergman does not fairly teach, suggest or disclose every element of claim 81, or its dependent claims 82, 85, 88, 89, and 97.

Applicants have amended each of independent claims 97, 99, 101 and 102 to recite, "the shared language model having a present context based on words in the provided text data of the memory." Support for these amendments is found in at least paragraphs [0154]-[0155] of the specification. For reasons similar to as discussed with regard to claim 81, applicants respectfully submit that Ditzik in view of Bellegarda further in view of Bergman does not fairly teach, suggest, or disclose every element of claims 97, 99, 101 and 102, or claim 98, which depends from claim 97.

Claim 83 stands rejected under 35 USC 103(a) as being unpatentable over Ditzik in view of Bellegarda and Berman and further in view of Watterson et al. (Pat. No. 4,969180, hereinafter "Watterson"). Applicant respectfully submits that Watterson fails to disclose or suggest those elements of independent claim 81 that are missing from Ditzik in view of

Bellegarda and Berman. For at least the above reasons, applicant respectfully submits that claim 83 is in condition for allowance.

Claims 86, 92 and 98 stand rejected under 35 USC 103(a) as being unpatentable over Ditzik in view of Bellegarda and Berman, and further in view of Shim (Pat. No. 6,853,850). Applicant respectfully submits that Shim fails to disclose or suggest those elements of independent claims 81 (with respect to claims 86 and 92) and 97 (with respect to claim 98) that are missing from Ditzik in view of Bellegarda and Berman. For at least the above reasons, applicant respectfully submits that claims 86, 92 and 98 are in condition for allowance.

Claims 87 and 93-96 stand rejected under 35 USC 103(a) as being unpatentable over Ditzik in view of Bellegarda and Berman, and further in view of Black (Pat. No. 6,307,956). Applicant respectfully submits that Black fails to disclose or suggest those elements of independent claim 81 that are missing from Ditzik in view of Bellegarda and Berman. For at least the above reasons, applicant respectfully submits that claims 87 and 93-96 are in condition for allowance.

Claims 90 and 91 stand rejected under 35 USC 103(a) as being unpatentable over Ditzik in view of Bellegarda and Berman, and further in view of a second Bellegarda patent (Pat. No. 5,839,106; hereinafter "Bellegarda(2)"). Applicant respectfully submits that Bellegarda(2) fails to disclose or suggest those elements of independent claim 81 that are missing from Ditzik in view of Bellegarda and Berman.

For at least the above reasons, applicant respectfully submits that claims 90-91 are in condition for allowance.

CONCLUSION

In view of the present claim amendments and remarks, applicants respectfully submit that the application is in condition to receive a Notice of Allowance.

Date: December 22, 2009

/Peter Trahms-Neudorfer/
Peter Trahms-Neudorfer
Registration No. 59,282

Woodcock Washburn LLP
Cira Centre
2929 Arch Street, 12th Floor
Philadelphia, PA 19104-2891
Telephone: (215) 568-3100
Facsimile: (215) 568-3439

Electronic Acknowledgement Receipt	
EFS ID:	6695012
Application Number:	11088032
International Application Number:	
Confirmation Number:	6401
Title of Invention:	Message recognition using shared language model
First Named Inventor/Applicant Name:	Edwin A. Suominen
Customer Number:	23377
Filer:	Peter Trahms-Neudorfer
Filer Authorized By:	
Attorney Docket Number:	**OR-0005
Receipt Date:	22-DEC-2009
Filing Date:	22-MAR-2005
Time Stamp:	19:20:45
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	Transmittal.PDF	276313 66b99e7fd011c39c93137756e11a7dc6d68c1529	no	2
Warnings:					
Information:					

2		asfiledresponse.PDF	129476 1aef8e5f18b56ff6b0002e2aa1db8e160e1c6293	yes	11

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment After Final	1	1
	Claims	2	7
	Applicant Arguments/Remarks Made in an Amendment	8	11

Warnings:	
Information:	
Total Files Size (in bytes):	405789

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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Doc Code: TRAN.LET
Document Description: Transmittal Letter

PTO/SB/21 (07-09)
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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission	13

Application Number	11/088,032
Filing Date	March 22, 2005
First Named Inventor	Edwin A. Suominen
Art Unit	2626
Examiner Name	Michael C. Colucci
Attorney Docket Number	**OR-0005

ENCLOSURES *(Check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☑ Amendment/Reply
  - ☑ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
  - ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) _____
  - ☐ Landscape Table on CD
- ☐ After Allowance Communication to TC
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- ☐ Proprietary Information
- ☐ Status Letter
- ☐ Other Enclosure(s) (please Identify below):

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Woodcock Washburn LLP		
Signature	/Peter Trahms-Neudorfer /		
Printed name	Peter Trahms-Neudorfer		
Date	December 22, 2009	Reg. No.	59,282

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Signature			
Typed or printed name		Date	

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 and1.14. 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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The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PTO/SB/06 (07-06)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 11/088,032	Filing Date 03/22/2005	☒ To be Mailed

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☐		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	12/22/2009	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 21	Minus	** 21	= 0	X $ =		OR	X $52=	0
	Independent (37 CFR 1.16(h))	* 5	Minus	***5	= 0	X $ =		OR	X $220=	0
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L 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.

Legal Instrument Examiner:
/KATRINA HARLING/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/088,032	03/22/2005	Edwin A. Suominen	**OR-0005	6401

23377 7590 12/10/2009

WOODCOCK WASHBURN LLP
CIRA CENTRE, 12TH FLOOR
2929 ARCH STREET
PHILADELPHIA, PA 19104-2891

EXAMINER	
COLUCCI, MICHAEL C	
ART UNIT	**PAPER NUMBER**
2626	

MAIL DATE	DELIVERY MODE
12/10/2009	PAPER

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

The time period for reply, if any, is set in the attached communication.

Interview Summary	Application No.	Applicant(s)	
	11/088,032	SUOMINEN, EDWIN A.	
	Examiner	Art Unit	
	MICHAEL C. COLUCCI	2626	

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

(1) *MICHAEL C. COLUCCI*. (3)_____.

(2) *PETER TRAHMS-NEUDORFER*. (4)_____.

Date of Interview: *03 December 2009*.

Type: a)☒ Telephonic b)☐ Video Conference
c)☐ Personal [copy given to: 1)☐ applicant 2)☐ applicant's representative]

Exhibit shown or demonstration conducted: d)☐ Yes e)☒ No.
If Yes, brief description: _____.

Claim(s) discussed: *ALL*.

Identification of prior art discussed: *ALL*.

Agreement with respect to the claims f)☒ was reached. g)☐ was not reached. h)☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: *See Continuation Sheet*.

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

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN A NON-EXTENDABLE PERIOD OF THE LONGER OF ONE MONTH OR THIRTY DAYS FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

/Michael C Colucci/ Examiner, Art Unit 2626	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

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

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

———

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

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

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

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

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

Continuation of Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments:

Examiner believes that proposed amendments such as an overarching context with reference to a "document" appear to overcome the prior ar of record, wherein the prior art of record, particularly Berman teaches context having a contextual point of reference lacking a document, such as a technical document (see present invention spec. [0155]) and instead allows a user to rely on his/her own broadest judgment. Therefore, an agreement has been reached, wherein proposed amendments linking overarching context to a documen appear to overcome the prior art of record, however a further search and analysis of both the claims and the prior art will be conducted.
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/088,032	03/22/2005	Edwin A. Suominen	**OR-0005	6401

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WOODCOCK WASHBURN LLP
CIRA CENTRE, 12TH FLOOR
2929 ARCH STREET
PHILADELPHIA, PA 19104-2891

EXAMINER	
COLUCCI, MICHAEL C	
ART UNIT	PAPER NUMBER
2626	

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

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	11/088,032	SUOMINEN, EDWIN A.	
	Examiner	Art Unit	
	MICHAEL C. COLUCCI	2626	

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 July 2009*.

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

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

Disposition of Claims

4)☒ Claim(s) *81-83 and 85-102* is/are pending in the application.

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

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *81-83 and 85-102* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

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

Application Papers

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

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

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

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

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

Priority under 35 U.S.C. § 119

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

a)☐ All b)☐ Some * c)☐ None of:

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

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

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

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

Attachment(s)

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

DETAILED ACTION

Response to Arguments

1. Applicants arguments with respect to claims 81-83 and 85-102 have been considered but are moot in view of the new grounds of rejection. Examiner believes that amendments to claims 81 and 97, "detecting instances in which a word or text segment obtained from the speech or handwriting recognizer is not contained within the context and to obtain user input indicative of a selected current context when a text segment of received user input is outside of the context", overcomes the teachings of Baker, wherein “ambiguous” text/speech is narrowed to “out of context” text/speech. As amended, Baker would not be able to find “out of context” segments alone, for example "I need to **run** the program" could take various ambiguous meanings such as to *run a computer program* or *physically jog on a treadmill using a cardiovascular training regiment/recommendation*. Baker could not decipher this given context. However, prior art exists that can detect subtle differences and allow for user selection and training to remedy future conditions.

Therefore, Examiner has incorporated Berman et al. US 5550930 A (hereinafter Berman) to address “out of context” analysis, wherein Berman improves the system of Ditzik (i.e. text to speech / speech to text) to include training with user correction and automatic correction for text out of context.

Claim Rejections - 35 USC § 103

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

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 81, 82, 85, 88, 89, 97, and 99-102 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ditzik US 6167376 A (hereinafter Ditzik) in view of Bellegarda et al. US 6285785 B1 (Bellegarda) and further in view of Berman et al. US 5550930 A (hereinafter Berman).

Re claims 81, 97, 99, 101, and 102, Ditzik teaches a system for generating text responsive to both voice and handwriting input, comprising:

(c) a tablet including (1) a tablet surface responsive to freehand input conveyed via manipulation of the stylus on or near the tablet surface to render ink-like indicia of the freehand input, and (3) a message recognizer including a speech recognizer and a handwriting recognizer (Col. 4 line 49 – Col. 5 line 2 & Fig. 2);

(d) wherein the speech recognizer is responsive to voice input conveyed via the microphone to provide text data in accordance with both a shared language model and an acoustic model (Col. 3 lines 49-64);

(e) the handwriting recognizer is responsive to freehand input conveyed via the stylus to provide text data (Col. 5 lines 38-67) in accordance with both the shared language model and a handwriting model, the shared language model having a context

However, Ditzik fails to teach a shared language model and an acoustic model (Bellegarda Col. 5 lines 15-25 & Fig. 2 items 26 and 54)

shared language model and a handwriting model (Bellegarda Col. 5 lines 15-25 & Fig. 2 items 24 and 54)

improving the accuracy of the writing and speech recognizer by training the shared language model by resolving text and speech input from said speech recognizer in accordance with text and speech input from said writing and speech recognizers

Bellegarda teaches a message recognition system 10 constructed and operated in accordance with a first embodiment of the invention. As employed herein a message is considered to be information generated by a human subject and entered into the system 10, the information being entered through an acoustic signal, a handwritten stroke signal, or through a combination of acoustic and stroke signals. The information may represent individual characters, including numbers, letters of the alphabet, punctuation and the like. The information may also represent words, phrases, and paragraphs.

Additionally, Bellegarda teaches a feature vector that is a combination of FV.sub.S and FV.sub.H. The speech and handwriting feature vectors are each generated in response to simultaneously provided acoustic and handwriting input. In that the sampling rates and durations of the input are different for the speech and handwriting channels a normalization block 52 normalizes the two inputs to a common time base and combines the normalized feature vectors into a single feature vector. This combination may be a synthetic concatenation of the four dimensional handwriting

vector with the 20 dimensional speech vector, as indicated in FIG. 4e, to provide a 24 dimensional combined vector (FV.sub.S,H). (Bellegarda Col. 10 line 57 – Col. 11 line 7).

Bellegarda also teaches that the foregoing and other problems are overcome and the objects of the invention are realized by method and apparatus that employs an integrated use of speech and handwriting recognition to improve an overall accuracy, in terms of throughput, of an automatic recognizer. The invention exploits complementarily acoustic and stroke information to provide method and apparatus having improved message recognition accuracy relative to either speech recognition or handwriting recognition alone (Bellegarda Col. 3 lines 53-61).

Further, Bellegarda teaches multi-dimensional vectors are employed to train the parameters of a set of combined word models, for a combined use of speech and handwriting, or to train two sets of word models, for separate use during speech and handwriting recognition. During use, the probabilities, or likelihoods, of each input feature vector are computed using the appropriate set(s) of word models to generate a list or lists of candidate words. A candidate word is selected as representing a message based upon criteria including the probability score and, for the separate-use message recognition system, two weighting factors derived during training of the models (Bellegarda Col. 4 lines 15-25).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Ditzik to incorporate improving the accuracy of the writing and speech recognizer by training the shared language model by resolving text and speech input from said speech recognizer in accordance with text

and speech input from said writing and speech recognizers as taught by Bellegarda to allow for an integrated use of speech and handwriting recognition to improve an overall accuracy, in terms of throughput, of an automatic recognizer, wherein the integration exploits a complementary use of acoustic and stroke information to provide method and apparatus having improved message recognition accuracy relative to either speech recognition or handwriting recognition alone (Bellegarda Col. 3 lines 53-61).

However, Ditzik in view of Bellegarda fails to teach that wherein the system is configured to improve the accuracy of the shared language model by detecting instances in which a word or text segment obtained from the speech or handwriting recognizer is not contained within the context and to obtain user input indicative of a selected current context when a text segment of received user input is outside of the context

Berman teaches a system that allows the user considerable flexibility in training the recognizer. In the above examples, a single handwritten character was recognized as two characters. The methods also support training when multiple handwritten characters are recognized as a single character. For example, if the "lc" in "calces" is recognized as the "k" in "cakes," the user can then select the "k" in the character boxes and enter the "lc" in the correction box for training. Similarly, the methods support training when multiple characters are incorrectly recognized as another group of multiple characters. For example, if the handwritten word "and" is misrecognized as the word "cued," the user can select all four characters in the character boxes--"cued"--and

enter "and" into the correction box for training. The methods also support context training. For example, if the handwritten characters "and" are misrecognized as "aud," the user may decide that the handwritten "n" when taken out of context could be a "u" or an "n." However, the user knows that when the handwritten "n" is within the context of the word "and" it should always be recognized as an "n." The methods allow the user to select the "aud" in the character boxes. The methods then display the handwritten "and" in the train box. The user enters "and" in the correction box. Thus, the recognizer is trained to recognize the handwritten "and" as the word "and" (Berman Col. 5 lines 26-51 & Fig. 1A-1F).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Ditzik in view of Bellegarda to incorporate improving the accuracy of the shared language model by detecting instances in which a word or text segment obtained from the speech or handwriting recognizer is not contained within the context and to obtain user input indicative of a selected current context when a text segment of received user input is outside of the context as taught by Berman to allow for out of context viewing which facilitates the determination of whether the misrecognition was the fault of sloppy handwriting or the fault of the recognizer, wherein the user is allowed to input data to train the recognizer training when multiple characters are incorrectly recognized as another group of multiple characters (Berman Col. 5 lines 26-51 & Fig. 1A-1F).

Re claim 82, Ditzik teaches the system of claim 81 wherein the microphone is head mounted substantially beyond an immediate vicinity of the head of an individual (Col. 3 line 65 – Col. 4 line 17).

Re claim 85, Ditzik teaches the system of claim [[1]] 81 wherein:

(a) the speech recognizes recognizer provides text data without being responsive to freehand input supplied to the [[the]] handwriting recognizes recognizer (Fig. 1); and

(b) the handwriting recognizer provides text data without being responsive to voice input supplied to the [[the]] speech recognizer (Fig. 2)

Re claim 88, Ditzik teaches the system of claim 81, wherein at least one of said speech recognizer and said handwriting recognizer (Col. 5 lines 38-67, *pattern databases for stylus strokes*) is configured to be responsive to an identifying signal to select a particular user message model to use when generating text responsive to said voice input (Col. 3 lines 49-64 *phoneme models for speech input*).

Re claim 89, Ditzik teaches the system of claim 88, wherein said particular user message model is remotely available over a wide area network (Col. 8 lines 15-29).

Re claim 100, Ditzik teaches the method according to claim 99, further comprising accessing at least one of said shared language model, said acoustic model

and said writing model (Col. 4 line 49 – Col. 5 line 2 & Fig. 2) via a network (Col. 8 lines 15-29).

However, Ditzik fails to teach a shared language model

Bellegarda teaches a message recognition system 10 constructed and operated in accordance with a first embodiment of the invention. As employed herein a message is considered to be information generated by a human subject and entered into the system 10, the information being entered through an acoustic signal, a handwritten stroke signal, or through a combination of acoustic and stroke signals. The information may represent individual characters, including numbers, letters of the alphabet, punctuation and the like. The information may also represent words, phrases, and paragraphs.

Additionally, Bellegarda teaches a feature vector that is a combination of FV.sub.S and FV.sub.H. The speech and handwriting feature vectors are each generated in response to simultaneously provided acoustic and handwriting input. In that the sampling rates and durations of the input are different for the speech and handwriting channels a normalization block 52 normalizes the two inputs to a common time base and combines the normalized feature vectors into a single feature vector. This combination may be a synthetic concatenation of the four dimensional handwriting vector with the 20 dimensional speech vector, as indicated in FIG. 4e, to provide a 24 dimensional combined vector (FV.sub.S,H). (Bellegarda Col. 10 line 57 – Col. 11 line 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention accessing at least one of said shared language model, said

acoustic model and said writing model via a network for the purposes of hand writing and speech complementing one another, wherein difficult pronunciations or spelling error may occur (i.e. a user can override writing a long word by just uttering the word itself).

4. Claim 83 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ditzik US 6167376 A (hereinafter Ditzik) in view of Bellegarda et al. US 6285785 B1 (Bellegarda) and Berman et al. US 5550930 A (hereinafter Berman) and further in view of Watterson et al US 4969180 A (hereinafter Watterson).

Re claim 83, Ditzik in view of Bellegarda and Berman fails to teach the system of claim 82 wherein the microphone is housed in the stylus

Watterson teaches a functional writing pen as a cordless handset incorporating a microphone and speaker unit, which can conveniently serve as both a pen and a telephone handset for normal telephone conversation (Watterson Col. 2 lines 11-20).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention a microphone housed in a stylus, wherein housing a microphone within a writing instrument such as a stylus or pen would allow for hands-free communication with a speech recognition system to provide a more convenient means for a user to input data through by handwriting and/or speech and not holding a microphone in addition to a stylus.

5. **Claims 86, 92, and 98 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ditzik US 6167376 A (hereinafter Ditzik) in view of Bellegarda et al. US 6285785 B1 (Bellegarda) and Berman et al. US 5550930 A (hereinafter Berman) and further in view of Shim et al. US 6853850 B2 (hereinafter Shim).**

Re claim 86, Ditzik in view of Bellegarda and Berman fails to teach the system of claim 81, wherein said stylus is equipped with a proximity sensor that is configured to sense a proximity of a human head to said microphone

Shim teaches adjusting the speaker volume and/or the microphone gain to provide optimum audio signal levels for that situation. If the estimated sensor-head distance is greater than the reference distance, the system (1) adjusts the speaker volume and/or the microphone gain to its maximum signal level and/or (2) notifies the user that the maximum signal level may be inadequate to maintain acceptable audio communication and/or (3) disables the speaker and/or the microphone until the sensor-head distance is no greater than the reference distance or (4) takes no action. More than one proximity zone, each with its own reference distance and/or zone center, can be defined and sensed by the system. The minimum-to-maximum range for speaker volume and/or for microphone gain is adjustable for each user (Shim Col. 1 line 67 – Col. 2 line 22).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention stylus is equipped with a proximity sensor that is configured to sense a proximity of a human head to said microphone for the purposes of adjusting

gain from a user, wherein ideal audio levels can be input into the processor for accurate speech recognition, wherein a minimum and maximum distance from the microphone can be implemented to establish thresholds.

Re claims 92 and 98, Ditzik in view of Bellegarda and Berman fails to teach the system of claim 81, further comprising an activation circuit that is configured to sense when a user moves said stylus away from said user's mouth and toward said tablet in order to configure said tablet for editing

Shim teaches adjusting the speaker volume and/or the microphone gain to provide optimum audio signal levels for that situation. If the estimated sensor-head distance is greater than the reference distance, the system (1) adjusts the speaker volume and/or the microphone gain to its maximum signal level and/or (2) notifies the user that the maximum signal level may be inadequate to maintain acceptable audio communication and/or (3) disables the speaker and/or the microphone until the sensor-head distance is no greater than the reference distance or (4) takes no action. More than one proximity zone, each with its own reference distance and/or zone center, can be defined and sensed by the system. The minimum-to-maximum range for speaker volume and/or for microphone gain is adjustable for each user (Shim Col. 1 line 67 – Col. 2 line 22).

If the microphone is housed within the stylus, then various zones can be implemented to measure the distance a person is from a microphone (i.e. stylus with microphone housed in it), wherein if the stylus is at a certain distance from the user,

then the handwriting recognition system will be expecting the user to begin writing, and the speech recognition system will not.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention stylus is equipped with a proximity sensor that is configured to sense a proximity of a human head to said microphone for the purposes of adjusting gain from a user, wherein ideal audio levels can be input into the processor for accurate speech recognition, wherein a minimum and maximum distance from the microphone can be implemented to establish thresholds that can identify when the stylus is at a certain distance from the user for the handwriting recognition system to begin expecting the user to begin writing.

6. **Claims 87 and 93-96 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ditzik US 6167376 A (hereinafter Ditzik) in view of Bellegarda et al. US 6285785 B1 (Bellegarda) and Berman et al. US 5550930 A (hereinafter Berman) and further in view of Black US 6307956 B1 (hereinafter Black).**

Re claim 87, Ditzik in view of Bellegarda and Berman fails to teach the system of claim 81, wherein said stylus is equipped with an identification circuit that is configured to identify an owner of said stylus

Black teaches a stylus 15 includes one or more sensors 20 that capture biometric properties of the user. The computer (chip) 40 processes the captured information to determine whether to enable access to an account/network/entry, or other entry or

privilege once identification has been confirmed. In one preferred embodiment, the system includes means to enable the user to enter a primary identifier, the identifier being a series of letters, digits, a spoken word converted to text (speech recognition), or the like. The primary identifier is preferably the user's printed name, the user's birthday (and year), zip code, mother's maiden name, or PIN or password. (Black Col. 10 line 28-39 & Fig. 1)

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention stylus is equipped with an identification circuit that is configured to identify an owner of said stylus for the purposes of preventing an unknown user from accessing specific user-trained models/databases, wherein information specific to a user must be input prior to operation speech and/or handwriting operations.

Re claim 93, Ditzik teaches the system of claim 81, wherein a user message model is an instantiation for a particular user of said shared language model, said acoustic model, and said handwriting model (Col. 3 lines 49-64).

However, Ditzik fails to teach a shared language model

Bellegarda teaches a message recognition system 10 constructed and operated in accordance with a first embodiment of the invention. As employed herein a message is considered to be information generated by a human subject and entered into the system 10, the information being entered through an acoustic signal, a handwritten stroke signal, or through a combination of acoustic and stroke signals. The information may represent individual characters, including numbers, letters of the alphabet,

punctuation and the like. The information may also represent words, phrases, and paragraphs.

Additionally, Bellegarda teaches a feature vector that is a combination of FV.sub.S and FV.sub.H. The speech and handwriting feature vectors are each generated in response to simultaneously provided acoustic and handwriting input. In that the sampling rates and durations of the input are different for the speech and handwriting channels a normalization block 52 normalizes the two inputs to a common time base and combines the normalized feature vectors into a single feature vector. This combination may be a synthetic concatenation of the four dimensional handwriting vector with the 20 dimensional speech vector, as indicated in FIG. 4e, to provide a 24 dimensional combined vector (FV.sub.S,H). (Bellegarda Col. 10 line 57 – Col. 11 line 7).

However, Ditzik in view of Bellegarda and Berman fails to teach a user message model is an instantiation for a particular user

Black teaches a stylus 15 includes one or more sensors 20 that capture biometric properties of the user. The computer (chip) 40 processes the captured information to determine whether to enable access to an account/network/entry, or other entry or privilege once identification has been confirmed. In one preferred embodiment, the system includes means to enable the user to enter a primary identifier, the identifier being a series of letters, digits, a spoken word converted to text (speech recognition), or the like. The primary identifier is preferably the user's printed name, the user's birthday (and year), zip code, mother's maiden name, or PIN or password. (Black Col. 10 line 28-39 & Fig. 1)

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention a user message model is an instantiation for a particular user of said shared language model, said acoustic model, and said handwriting model for the purposes of hand writing and speech complementing one another, wherein difficult pronunciations or spelling error may occur (i.e. a user can override writing a long word by just uttering the word itself). Additionally, it would have been obvious to one of ordinary skill in the art at the time of the invention a user message model is an instantiation for a particular user for the purposes of preventing an unknown user from accessing specific user-trained models/databases, wherein information specific to a user must be input prior to operation speech and/or handwriting operations.

Re claim 94, Ditzik teaches the system of claim 93, wherein said user message model is local to said system (Col. 3 line 65 – Col. 4 line 17).

Re claim 95, Ditzik teaches the system of claim 94, wherein said user message model is implemented in a virtual machine (Col. 6 lines 32-58).

Re claim 96, Ditzik teaches the system of claim 93, wherein said user message model is remotely stored in a database (Col. 3 line 65 – Col. 4 line 17)

7. **Claims 90 and 91 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ditzik US 6167376 A (hereinafter Ditzik) in view of Bellegarda et al. US 6285785 B1 (Bellegarda) and Berman et al. US 5550930 A (hereinafter Berman) and further in view of Bellegarda US 5839106 A (hereinafter Bellegarda(2)).**

Re claim 90, Ditzik fails to teach the system of claim 81, further comprising a unified message model that includes said acoustic model, said handwriting model, and said shared language model, wherein said shared language model (Bellegarda Col. 5 lines 15-25 & Fig. 2 items 24 and 54) includes a syntactic model and a semantic model

Bellegarda teaches a message recognition system 10 constructed and operated in accordance with a first embodiment of the invention. As employed herein a message is considered to be information generated by a human subject and entered into the system 10, the information being entered through an acoustic signal, a handwritten stroke signal, or through a combination of acoustic and stroke signals. The information may represent individual characters, including numbers, letters of the alphabet, punctuation and the like. The information may also represent words, phrases, and paragraphs.

Additionally, Bellegarda teaches a feature vector that is a combination of FV.sub.S and FV.sub.H. The speech and handwriting feature vectors are each generated in response to simultaneously provided acoustic and handwriting input. In that the sampling rates and durations of the input are different for the speech and handwriting channels a normalization block 52 normalizes the two inputs to a common time base and combines the normalized feature vectors into a single feature vector.

This combination may be a synthetic concatenation of the four dimensional handwriting vector with the 20 dimensional speech vector, as indicated in FIG. 4e, to provide a 24 dimensional combined vector (FV.sub.S,H). (Bellegarda Col. 10 line 57 – Col. 11 line 7).

However, Ditzik in view of Bellegarda and Berman fails to teach a syntactic model and a semantic model

Bellegarda(2) teaches a hybrid recognition processor 220 might use an n-gram syntactic-type first model 310 to produce a list of candidate text messages from a sequence of feature vectors, and then employ a latent semantic-type second model 320 to rescore the list so that the most likely candidate, or hypothesis, is moved to the top of the list as necessary (Bellegarda(2) Col. 6 lines 51-67). Of course, such a sequential approach to integration will fail if the correct hypothesis is not included in the original list of candidates produced during the first recognition pass. Such failure may be prevented, however, by producing a relatively long list of candidates during the first pass, so that the original list is virtually guaranteed to include the correct hypothesis.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention a unified message model that includes said acoustic model, said handwriting model, and said shared language model, wherein said shared language model includes a syntactic model and a semantic model for the purposes of hand writing and speech complementing one another, wherein difficult pronunciations or spelling error may occur (i.e. a user can override writing a long word by just uttering the word itself). Additionally, it would have been obvious to one of ordinary skill in the art at the time of the invention a semantic and syntactic model for the purposes of further

correcting a ranked list of potential candidates by analyzing the context and grammar rules for a language to receive speech or handwriting, wherein the best candidate can be selected to be generated as text while conserving memory resources.

Re claim 91, Ditzik in view of Bellegarda and Berman fails to teach the system of claim 90, wherein said semantic model comprises at least one of:

(a) a semantic cluster of a first type that is a mathematically derived group of vectors representing text segments (Bellegarda(2) Col. 6 lines 51-67);

(b) a semantic cluster of a second type that is a discrete grouping of text that has a particular context; and

(c) a semantic cluster of a third type that is defined with respect to an individual reference word that is considered to be indicative of a particular context.

Bellegarda(2) teaches a hybrid recognition processor 220 might use an n-gram syntactic-type first model 310 to produce a list of candidate text messages from a sequence of feature vectors, and then employ a latent semantic-type second model 320 to rescore the list so that the most likely candidate, or hypothesis, is moved to the top of the list as necessary (Bellegarda(2) Col. 6 lines 51-67). Of course, such a sequential approach to integration will fail if the correct hypothesis is not included in the original list of candidates produced during the first recognition pass. Such failure may be prevented, however, by producing a relatively long list of candidates during the first pass, so that the original list is virtually guaranteed to include the correct hypothesis.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention a semantic cluster of a first type that is a mathematically derived group of vectors representing text segments for the purposes of further correcting a ranked list of potential candidates by analyzing the context and grammar rules for a language to receive speech or handwriting, wherein the best candidate can be selected to be generated as text while conserving memory resources.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael C. Colucci whose telephone number is (571)-270-1847. The examiner can normally be reached on 9:30 am - 6:00 pm, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571)-272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael C Colucci/
Examiner, Art Unit 2626
Patent Examiner
AU 2626
(571)-270-1847
Examiner FAX: (571)-270-2847

Michael.Colucci@uspto.gov

/Richemond Dorvil/
Supervisory Patent Examiner, Art Unit 2626

Notice of References Cited	Application/Control No. 11/088,032	Applicant(s)/Patent Under Reexamination SUOMINEN, EDWIN A.	
	Examiner MICHAEL C. COLUCCI	Art Unit 2626	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,550,930 A	08-1996	Berman et al.	382/187
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

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

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

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11088032	SUOMINEN, EDWIN A.
	Examiner	Art Unit
	Colucci, Michael C	2626

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/05/2007	06/04/2008	11/07/2008	04/16/2009	10/20/2009				
	81	✓	✓	✓	✓	✓				
	82	✓	✓	✓	✓	✓				
	83	✓	✓	✓	✓	✓				
	84	✓	✓	-	-	-				
	85	✓	✓	✓	✓	✓				
	86		✓	✓	✓	✓				
	87		✓	✓	✓	✓				
	88		✓	✓	✓	✓				
	89		✓	✓	✓	✓				
	90		✓	✓	✓	✓				
	91		✓	✓	✓	✓				
	92		✓	✓	✓	✓				
	93		✓	✓	✓	✓				
	94		✓	✓	✓	✓				
	95		✓	✓	✓	✓				
	96		✓	✓	✓	✓				
	97		✓	✓	✓	✓				
	98		✓	✓	✓	✓				
	99		✓	✓	✓	✓				
	100		✓	✓	✓	✓				
	101			✓	✓	✓				
	102			✓	✓	✓				

Index of Claims	Application/Control No. 11088032	Applicant(s)/Patent Under Reexamination SUOMINEN, EDWIN A.
	Examiner Colucci, Michael C	Art Unit 2626

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
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☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/05/2007	06/04/2008	11/07/2008	04/16/2009	10/20/2009				

Index of Claims	Application/Control No. 11088032	Applicant(s)/Patent Under Reexamination SUOMINEN, EDWIN A.
	Examiner Colucci, Michael C	Art Unit 2626

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
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☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/05/2007	06/04/2008	11/07/2008	04/16/2009	10/20/2009				

U.S. Patent and Trademark Office

Part of Paper No. : 20091020

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11088032	SUOMINEN, EDWIN A.
	Examiner	Art Unit
	Colucci, Michael C	2626

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/05/2007	06/04/2008	11/07/2008	04/16/2009	10/20/2009				

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11088032	SUOMINEN, EDWIN A.
	Examiner	Art Unit
	Colucci, Michael C	2626

SEARCHED

Class	Subclass	Date	Examiner
382	187	11/5/2007	MC
704	256, 270	11/5/2007	MC
704	235, 257	6/4/2008	MC
379	56.1	6/4/2008	MC
382	124, 187	6/4/2008	MC
455	550.1	6/4/2008	MC
704	257	4/16/2009	MC
382	187	10/20/2009	MC

SEARCH NOTES

Search Notes	Date	Examiner
Searched 382/187 with keyword limitations	11/5/2007	MC
Searched 704/256 with keyword limitations	11/5/2007	MC
Searched 704/270 with keyword limitations	11/5/2007	MC
Consulted SPE Richemond Dorvil	11/5/2007	MC
Searched 704/235 with keyword limitations	6/4/2008	MC
Searched 704/257 with keyword limitations	6/4/2008	MC
Searched 379/56.1 with keyword limitations	6/4/2008	MC
Searched 382/124 with keyword limitations	6/4/2008	MC
Searched 455/550.1 with keyword limitations	6/4/2008	MC
Searched 382/187 with keyword limitations	6/4/2008	MC
Performed a double patenting search	5/27/2008	MC
Performed an inventors search	5/27/2008	MC
Consulted SPE Richemond Dorvil	5/27/2008	MC
Consulted Primary Examiner Talivaldis Smits	5/27/2008	MC
Checked the spec. for "medium" - not a signal	11/7/2008	MC
Searched 704/257 with keyword limitations	4/16/2009	MC
Searched 382/187 with keyword limitations	10/20/2009	MC

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L22	89	21 and text and speech	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2009/10/20 13:40
L21	657	(382/187). CCLS.	USPAT; USOCR; EPO	OR	OFF	2009/10/20 13:40
L17	42	context$4 with (outside out (out near2 of)) with user with (replac$5 select $5 choos$6) with (voice speech word$2 text$5)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2009/10/20 12:56
L16	1	15 not output $2	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2009/10/20 12:55
L15	18	14 and 7	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2009/10/20 12:39
L14	89	context$4 with (out$5 (out near2 of)) with user with (replac$5 select $5 choos$6) with (voice speech word$2 text$5)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2009/10/20 12:38
L13	89	context$4 with out$5 with user with (replac$5 select $5 choos$6) with (voice speech word$2 text$5)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2009/10/20 12:38
L12	150	11 and 7	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2009/10/20 12:36

L11	1350	context$4 with user with (replac$5 select $5 choos$6) with (voice speech word$2 text$5)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2009/10/20 12:36
L10	3	outside with context$4 with user with (replac$5 select $5 choos$6) with (voice speech word$2 text$5)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2009/10/20 12:34
L9	0	outside with context$4 with user with (replac$5 select $5 choos$6) with text$5	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2009/10/20 12:34
L8	2	6 and 7	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2009/10/20 12:33
L7	19683	("704").CLAS.	USPAT; USOCR; EPO	OR	OFF	2009/10/20 12:33
L6	87	outside with context$4 with user with (replac$5 select $5 choos$6)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2009/10/20 12:33
L5	605	outside with context$4 with user	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2009/10/20 12:33

10/20/2009 1:46:14 PM
C:\Documents and Settings\mcolucci\My Documents\EAST\Workspaces\11088032.wsp

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: **Edwin A. Suominen**	Confirmation No.: **6401**
Application No.: **11/088,032**	Group Art Unit: **2626**
Filing Date: **March 22, 2005**	Examiner: **Michael C. Colucci**

For: **MESSAGE RECOGNITION USING SHARED LANGUAGE MODEL**

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

Sir:

REPLY PURSUANT TO 37 CFR § 1.111

In response to the Official Action dated **April 21, 2009**, reconsideration is respectfully requested in view of the amendments and/or remarks as indicated below:

☒ **Amendments to the Specification** begin on page 2 of this paper.

☒ **Amendments to the Claims** are reflected in the listing of the claims which begins on page 3 of this paper.

☐ **Amendments to the Drawings** begin on page of this paper and include an attached replacement sheet.

☒ **Remarks** begin on page 9 of this paper.

☐ **Request For Refund** submitted herewith.

Amendments to the Specification:

Please amend the section titled "CROSS-REFERENCE TO RELATED APPLICATIONS" as follows:

This application is a continuation of U.S. application Serial No. 10/061,052 filed on January 28, 2002, now U.S. Patent 6,904,405 which is a continuation of U.S. application Serial No. 09/616,157 filed on July 14, 2000, now abandoned, which claims benefit of U.S. provisional application Serial No. 60/144,481 filed on July 17, 1999.

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

Listing of Claims:

Claims 1-80 (canceled)

Claim 81 (currently amended) A system for generating text responsive to both voice and handwriting input, comprising:

~~a microphone;~~

~~a stylus;~~

a tablet including [[(1)]] a tablet surface~~, (2) a flat-panel display integrated into the tablet surface and~~ responsive to freehand input conveyed via manipulation of [[the]] a stylus on or near the tablet surface to render ink-like indicia of the freehand input, and [[(3)]] a message recognizer including a speech recognizer and a handwriting recognizer;

wherein the speech recognizer is responsive to voice input conveyed via [[the]] a microphone to provide text data in accordance with both a shared language model, the shared language model having a context, and an acoustic model;

~~when a current context of received user input cannot be determined,~~ wherein the system is configured to improve the accuracy of the shared language model ~~is increased from received user input indicative of selecting the current context from a plurality of provided contexts, the received user input obtained from a speech recognizer or a handwriting recognizer~~ by detecting instances in which a word or text segment obtained from the speech or handwriting recognizer is not contained within the context and to obtain user input indicative of a selected current context when a text segment of received user input is outside of the context; and

wherein the handwriting recognizer is responsive to freehand input conveyed via the stylus to provide text data in accordance with both the shared language model and a handwriting model.

Claim 82 (previously presented) The system of claim 81 wherein the microphone is mounted substantially beyond an immediate vicinity of the head of an individual.

Claim 83 (previously presented) The system of claim 82 wherein the microphone is housed in the stylus.

Claim 84 (Cancelled)

Claim 85 (previously presented) The system of claim 81 wherein:

the speech recognizer provides text data without being responsive to freehand input supplied to the handwriting recognizer; and

the handwriting recognizer provides text data without being responsive to voice input supplied to the speech recognizer.

Claim 86 (previously presented) The system of claim 81, wherein said stylus is equipped with a proximity sensor that is configured to sense a proximity of a human head to said microphone.

Claim 87 (previously presented) The system of claim 81, wherein said stylus is equipped with an identification circuit that is configured to identify an owner of said stylus.

Claim 88 (previously presented) The system of claim 81, wherein at least one of said speech recognizer and said handwriting recognizer is configured to be responsive to an identifying signal to select a particular user message model to use when generating text responsive to said voice input.

Claim 89 (previously presented) The system of claim 88, wherein said particular user message model is remotely available over a wide area network.

Claim 90 (currently amended) The system of claim 81, further comprising a unified message model that includes an ~~said~~ acoustic model, said handwriting model, and said shared language model, wherein said shared language model includes a syntactic model and a semantic model.

Claim 91 (previously presented) The system of claim 90, wherein said semantic model comprises at least one of:

a semantic cluster of a first type that is a mathematically derived group of vectors representing text segments;

a semantic cluster of a second type that is a discrete grouping of text that has a particular context; and

a semantic cluster of a third type that is defined with respect to an individual reference word that is considered to be indicative of a particular context.

Claim 92 (previously presented) The system of claim 81, further comprising an activation circuit that is configured to sense when a user moves said stylus away from said user's mouth and toward said tablet in order to configure said tablet for editing.

Claim 93 (currently amended) The system of claim 81, wherein a user message model is an instantiation for a particular user of said shared language model, ~~said~~ an acoustic model, and said handwriting model.

Claim 94 (previously presented) The system of claim 93, wherein said user message model is local to said system.

Claim 95 (previously presented) The system of claim 94, wherein said user message model is implemented in a virtual machine.

Claim 96 (previously presented) The system of claim 93, wherein said user message model is remotely stored in a database.

Claim 97 (currently amended) A method for generating, by a device comprising a processor, a display, a pressure sensitive region, a speech recognizer that converts audio to text, and a handwriting recognizer that converts handwriting to text, text responsive to both voice and handwriting input, comprising:

~~Activating, by a device comprising a processor, a display, a pressure-sensitive region and a microphone, a speech recognizer and a handwriting recognizer;~~

[[P]]processing, by the device, with said speech recognizer voice input conveyed via a microphone to provide [[a]] first text data in accordance with both a shared language model and an acoustic model;

determining, by the device, ~~that a context of a word of the voice input cannot be determined~~ when a word of the voice input is outside of a present context

providing, by the device, a plurality of possible contexts for the word;

processing, by the device, with said handwriting recognizer hand input conveyed via a stylus to provide a the context for the word in accordance with both the shared language model and a handwriting model; [[and]]

generating, by the device, second ~~a third~~ text data based on a combination of said speech recognizer processing and said handwriting recognizer processing; and

improving, by the device, the accuracy of said handwriting recognizer by training the handwriting recognizer in response to user correction by the speech recognizer.

Claim 98 (previously presented) The method according to claim 97, further comprising switching modes from processing input with said speech recognizer to processing input with said handwriting recognizer when said stylus moves away from a user's mouth and towards a tablet.

Claim 99 (currently amended) A method for receiving and processing a plurality of different types of input and converting said inputs into text data, comprising:

receiving, by electronics, voice input, wherein said voice input is conveyed via a stylus mounted microphone;

responding, by the electronics, to said voice input with a speech recognizer, wherein said speech recognizer is configured to provide text data in accordance with both a shared language model and an acoustic model;

determining, by the electronics, that a context of a word of said voice input is ambiguous;

determining ~~providing~~, by the electronics, a plurality of available contexts for the word;

receiving, by the electronics, writing input, wherein said writing input is indicative of the context for the word, the context being one of the available contexts;

responding, by the electronics, to said writing input with a writing recognizer, wherein said writing recognizer is configured to provide text data in accordance with both

the shared language model and a writing model;

improving, by the electronics, the accuracy of the speech recognizer by training the shared language model by resolving text input from said writing recognizer in accordance with text input from said speech recognizer.

Claim 100 (previously presented) The method according to claim 99, further comprising accessing at least one of said shared language model, said acoustic model and said writing model via a network.

Claim 101 (currently amended) A tangible computer-readable ~~storage~~ medium, having instructions stored thereon, the instructions comprising ~~instructions that when executed on a processor cause the processor to perform the steps of~~:

receiving writing input;

responding to said voice input with a speech recognizer, wherein said speech recognizer is configured to provide text data in accordance with both a shared language model and an acoustic model;

determining that a context of a word of said voice input is ambiguous;

providing a plurality of possible contexts for the word;

receiving writing input, wherein said writing input is indicative of a context for the word, the context being one of the possible contexts;

responding to said writing input with a writing recognizer, wherein said writing recognizer is configured to provide text data in accordance with both the shared language model and a writing model; and

increasing the accuracy of the speech recognizer by training the shared language model by resolving text input from said writing recognizer in accordance with text input from said speech recognizer.

Claim 102 (previously presented) An apparatus for generating text responsive to both voice and handwriting input, comprising:

means for receiving writing input;

means for responding to said voice input with a speech recognizer, wherein said

speech recognizer is configured to provide text data in accordance with both a shared language model and an acoustic model;

means for determining that a context of a word of said voice input is ambiguous;

means for providing a plurality of possible contexts for the word;

means for receiving writing input, wherein said writing input is indicative of the context for the word, the context being one of the possible contexts;

means for responding to said writing input with a writing recognizer, wherein said writing recognizer is configured to provide text data in accordance with both the shared language model and a writing model; and

means for increasing the accuracy of the speech recognizer by training the shared language model by resolving text input from said writing recognizer in accordance with text input from said speech recognizer.

REMARKS

Claims 81-83 and 85-102 are pending in the present application. Claims 81-83 and 85-102 stand rejected. Claims 81, 97, 99, 101 and 102 are the independent claims.

Telephonic Examiner Interview

Examiner Coluci and the undersigned conducted a telephonic interview on June 30, 2009. Independent claim 81 was discussed and agreement was reached that the present claim amendments overcome the present rejection.

Amendments to Specification

Applicants have amended the specification to identify the number of the patent of which the present application is a continuation.

Claim Rejections – 35 USC 103

Claims 81, 82, 85, 88, 89, 97 and 99-102 stand rejected under 35 USC 103(a) as being unpatentable over Ditzik (Pat. No. 6,167,376) in view of Bellegarda et al. (Pat. No. 6,285,785, hereinafter "Bellegarda") and further in view of Baker et al. (Pat. No. 6,161,091, hereinafter "Baker").

Claim 81, as amended, recites, in part, "the system is configured to increase the accuracy of the shared language model *by detecting instances in which a word or text segment obtained from the speech or handwriting recognizer is not contained within the context and to obtain user input indicative of a selected current context when a text segment of received user input is outside of the context*," (emphasis added). This amendment is supported by the specification in at least paragraphs [0182]-[0185]. The examiner states that the prior portion of that recitation ("selecting the current context from a plurality of provided contexts…when a current context of received user input cannot be determined") is taught by Baker at Col. 6, lines 50-60 and col. 23 lines 53-65. Applicant respectfully disagrees. While applicant has amended the claim language to clarify the technique used, applicant will

address the rejection of the prior claim language insomuch as it clarifies the present references.

Baker at Col. 6, lines 50-60 reads, in part: "For example, the choice word 'car' can have a semantic profile that can include synonyms of the noun 'car' such as 'automobile' or 'vehicle,' as well as including words related to the topics associated with the word 'car' such as 'transportation' or 'mechanic.' In a further step, the system compares the words in the selected passages with the context words in the document or utterance containing the current word." This passage appears to disclose determining a word based on the context in which the word appears. That is, the technique involves being able to determine the context itself. In contrast, the present claim language operates "to obtain user input indicative of a selected current context when a text segment of received user input is outside of the context…" Since Baker discloses determining a word based on the context in which it appears, applicant respectfully submits that Baker neither discloses nor suggests a situation where "a text segment of received user input is outside of the context…"

Further, the present claim language does not recite determining a word based on the context in which it appears but determining a context based on received input. Baker at col. 23 lines 53-65 reads, in part: "As described above, the correlation between the words 86 and the choice words 20A-20E can include a heuristic process that selects a choice word 20A-20E by identifying occurrences of the selected choice word within one or more of the lists of words 86." This excerpt appears to disclose a technique for determining a choice word from a list of choice words. In contrast, the present claim language recites determining not a word, but a context: "…received user input indicative of selecting the current context from a plurality of provided contexts." As such, applicant respectfully submits that Baker neither discloses nor suggests the above language of claim 81.

Applicant further respectfully submits that neither Ditzik nor Bellegarda disclose or suggest those portions of claim 81 that Baker neither discloses nor suggests.

For at least the above reasons, applicant respectfully submits that independent claim 81 is in condition for allowance, as are dependent claims 82-83 and 85-96.

Independent claims 97, 99, 101 and 102 make recitations similar to those found in independent claim 81. For reasons similar to the above, applicant respectfully submits that

claims 97, 99, 101 and 102 are in condition for allowance, as are claims 98 and 100, which depend from claims 97 and 99, respectively.

Claim 83 stands rejected under 35 USC 103(a) as being unpatentable over Ditzik in view of Bellegarda and Baker and further in view of Watterson et al. (Pat. No. 4,969180, hereinafter "Watterson"). Applicant respectfully submits that Watterson fails to disclose or suggest those elements of independent claim 81 that are missing from Ditzik in view of Bellegarda and Baker. For at least the above reasons, applicant respectfully submits that claim 83 is in condition for allowance.

Claims 86, 92 and 98 stand rejected under 35 USC 103(a) as being unpatentable over Ditzik in view of Bellegarda and Baker, and further in view of Shim (Pat. No. 6,853,850). Applicant respectfully submits that Shim fails to disclose or suggest those elements of independent claims 81 (with respect to claims 86 and 92) and 97 (with respect to claim 98) that are missing from Ditzik in view of Bellegarda and Baker. For at least the above reasons, applicant respectfully submits that claims 86, 92 and 98 are in condition for allowance.

Claims 87 and 93-96 stand rejected under 35 USC 103(a) as being unpatentable over Ditzik in view of Bellegarda and Baker, and further in view of Black (Pat. No. 6,307,956). Applicant respectfully submits that Black fails to disclose or suggest those elements of independent claim 81 that are missing from Ditzik in view of Bellegarda and Baker. For at least the above reasons, applicant respectfully submits that claims 87 and 93-96 are in condition for allowance.

Claims 90 and 91 stand rejected under 35 USC 103(a) as being unpatentable over Ditzik in view of Bellegarda and Baker, and further in view of a second Bellegarda patent (Pat. No. 5,839,106; hereinafter "Bellegarda(2)"). Applicant respectfully submits that Bellegarda(2) fails to disclose or suggest those elements of independent claim 81 that are missing from Ditzik in view of Bellegarda and Baker.

For at least the above reasons, applicant respectfully submits that claims 90-91 are in condition for allowance.

Date: July 21, 2009

/Peter Trahms-Neudorfer/
Peter Trahms-Neudorfer
Registration No. 59,282

Woodcock Washburn LLP
Cira Centre
2929 Arch Street, 12th Floor
Philadelphia, PA 19104-2891
Telephone: (215) 568-3100
Facsimile: (215) 568-3439

Electronic Acknowledgement Receipt

EFS ID:	5742681
Application Number:	11088032
International Application Number:	
Confirmation Number:	6401
Title of Invention:	Message recognition using shared language model
First Named Inventor/Applicant Name:	Edwin A. Suominen
Customer Number:	23377
Filer:	Peter Trahms-Neudorfer/Erika Eidsmoe
Filer Authorized By:	Peter Trahms-Neudorfer
Attorney Docket Number:	**OR-0005
Receipt Date:	21-JUL-2009
Filing Date:	22-MAR-2005
Time Stamp:	16:39:30
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	Transmittal.PDF	275994 4f4387096f3c3131cb926d63ef7b66255441593e	no	2
Warnings:					
Information:					

2		Response.PDF	136184 ee9a4550a617e1fbf398814e0629ce6d35c2ed07	yes	12

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Specification	2	2
	Claims	3	8
	Applicant Arguments/Remarks Made in an Amendment	9	12

Warnings:	
Information:	
Total Files Size (in bytes):	412178

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Doc Code: TRAN.LET
Document Description: Transmittal Letter

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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission	14

Application Number	11/088,032
Filing Date	March 22, 2005
First Named Inventor	Edwin A. Suominen
Art Unit	2626
Examiner Name	Michael C. Colucci
Attorney Docket Number	**OR-0005

ENCLOSURES *(Check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☑ Amendment/Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
  - ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) _____
  - ☐ Landscape Table on CD
- ☐ After Allowance Communication to TC
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- ☐ Proprietary Information
- ☐ Status Letter
- ☐ Other Enclosure(s) (please Identify below):

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Woodcock Washburn LLP		
Signature	/Peter Trahms-Neudorfer/		
Printed name	Peter Trahms-Neudorfer		
Date	July 21, 2009	Reg. No.	59,282

CERTIFICATE OF TRANSMISSION/MAILING

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			
Typed or printed name		Date	

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 and1.14. 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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Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
11/088,032	03/22/2005	

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☐		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

		(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
	07/21/2009	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
AMENDMENT	Total (37 CFR 1.16(i))	* 21	Minus	** 21	= 0	X $ =		OR	X $52=	0
	Independent (37 CFR 1.16(h))	* 5	Minus	***5	= 0	X $ =		OR	X $220=	0
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)					
		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
AMENDMENT	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L 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.

Legal Instrument Examiner:
/SHARAIN MORELAND/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/088,032	03/22/2005	Edwin A. Suominen	**OR-0005	6401

23377 7590 07/07/2009
WOODCOCK WASHBURN LLP
CIRA CENTRE, 12TH FLOOR
2929 ARCH STREET
PHILADELPHIA, PA 19104-2891

EXAMINER	
COLUCCI, MICHAEL C	
ART UNIT	PAPER NUMBER
2626	

MAIL DATE	DELIVERY MODE
07/07/2009	PAPER

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

The time period for reply, if any, is set in the attached communication.

Interview Summary	Application No.	Applicant(s)	
	11/088,032	SUOMINEN, EDWIN A.	
	Examiner	Art Unit	
	MICHAEL C. COLUCCI	2626	

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

(1) *MICHAEL C. COLUCCI*. (3)_____.

(2) *PETER TRAHMS-NEUDORFER*. (4)_____.

Date of Interview: *30 June 2009*.

Type: a)☒ Telephonic b)☐ Video Conference
c)☐ Personal [copy given to: 1)☐ applicant 2)☐ applicant's representative]

Exhibit shown or demonstration conducted: d)☐ Yes e)☒ No.
If Yes, brief description: _____.

Claim(s) discussed: *81*.

Identification of prior art discussed: *ALL*.

Agreement with respect to the claims f)☒ was reached. g)☐ was not reached. h)☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: *See Continuation Sheet*.

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

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN A NON-EXTENDABLE PERIOD OF THE LONGER OF ONE MONTH OR THIRTY DAYS FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

/Michael C Colucci/ Examiner, Art Unit 2626	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

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

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

———

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

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

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

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

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

Continuation of Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments:

Re claims 81, "by detecting instances in which a word or text segment obtained from the speech or handwriting recognizer is not contained within the context and to obtain user input indicative of a selected current context when a text segment of received user input is outside of the context". The differences between the prior art of record and the present invention were established, wherein the present invention improves accuracy ni relation to the user input being outside of the context of a text segment, wherein proposed amendments appear to further limit the scope of the claims. Therefore, an agreement has been reached, wherein arguments with respect to claim 81 appear to overcome the prior art of record, however a further search and analysis of both the claims and the prior art will be conducted.
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/088,032	03/22/2005	Edwin A. Suominen	**OR-0005	6401

23377 7590 04/21/2009
WOODCOCK WASHBURN LLP
CIRA CENTRE, 12TH FLOOR
2929 ARCH STREET
PHILADELPHIA, PA 19104-2891

EXAMINER	
COLUCCI, MICHAEL C	
ART UNIT	**PAPER NUMBER**
2626	

MAIL DATE	DELIVERY MODE
04/21/2009	PAPER

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

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	11/088,032	SUOMINEN, EDWIN A.	
	Examiner	Art Unit	
	MICHAEL C. COLUCCI	2626	

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 February 2009*.

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

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

Disposition of Claims

4)☒ Claim(s) *81-83 and 85-102* is/are pending in the application.

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

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *81-83 and 85-102* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

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

Application Papers

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

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

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

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

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

Priority under 35 U.S.C. § 119

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

a)☐ All b)☐ Some * c)☐ None of:

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

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

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

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

Attachment(s)

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

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 02/13/2009 has been entered.

Response to Arguments

2. Applicants arguments with respect to claims 81-83 and 85-102 have been considered but are moot in view of the new grounds of rejection. Examiner has incorporated Baker et al. US 6161091 A (hereinafter Baker) to address ambiguous word context and selection of a context from a group of context.

Claim Rejections - 35 USC § 103

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

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 81, 82, 85, 88, 89, 97, and 99-102 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ditzik US 6167376 A (hereinafter Ditzik) in view of Bellegarda et al. US 6285785 B1 (Bellegarda) and further in view of Baker et al. US 6161091 A (hereinafter Baker).

Re claims 81, 97, 99, 101, and 102, Ditzik teaches a system for generating text responsive to both voice and handwriting input, comprising:

(a) a microphone (Col. 2 line 65 – Col. 3 line 18);

(b) a stylus (Fig. 2 item 10); [[and]]

(c) a tablet including (1) a tablet surface, (2) a flat-panel display integrated into the tablet surface and responsive to freehand input conveyed via manipulation of the stylus on or near the tablet surface to render ink-like indicia of the freehand input, and (3) a message recognizer including a speech recognizer and a handwriting recognizer (Col. 4 line 49 – Col. 5 line 2 & Fig. 2);

(d) wherein the speech recognizer is responsive to voice input conveyed via the microphone to provide text data in accordance with both a shared language model and an acoustic model (Col. 3 lines 49-64);

(e) the handwriting recognizer is responsive to freehand input conveyed via the stylus to provide text data in accordance with both the shared language model and a handwriting model (Col. 5 lines 38-67)

However, Ditzik fails to teach a shared language model and an acoustic model (Bellegarda Col. 5 lines 15-25 & Fig. 2 items 26 and 54)

shared language model and a handwriting model (Bellegarda Col. 5 lines 15-25 & Fig. 2 items 24 and 54)

improving the accuracy of the writing and speech recognizer by training the shared language model by resolving text and speech input from said speech recognizer in accordance with text and speech input from said writing and speech recognizers

Bellegarda teaches a message recognition system 10 constructed and operated in accordance with a first embodiment of the invention. As employed herein a message is considered to be information generated by a human subject and entered into the system 10, the information being entered through an acoustic signal, a handwritten stroke signal, or through a combination of acoustic and stroke signals. The information may represent individual characters, including numbers, letters of the alphabet, punctuation and the like. The information may also represent words, phrases, and paragraphs.

Additionally, Bellegarda teaches a feature vector that is a combination of FV.sub.S and FV.sub.H. The speech and handwriting feature vectors are each generated in response to simultaneously provided acoustic and handwriting input. In that the sampling rates and durations of the input are different for the speech and handwriting channels a normalization block 52 normalizes the two inputs to a common time base and combines the normalized feature vectors into a single feature vector. This combination may be a synthetic concatenation of the four dimensional handwriting vector with the 20 dimensional speech vector, as indicated in FIG. 4e, to provide a 24 dimensional combined vector (FV.sub.S,H). (Bellegarda Col. 10 line 57 – Col. 11 line 7).

Bellagarda also teaches that the foregoing and other problems are overcome and the objects of the invention are realized by method and apparatus that employs an integrated use of speech and handwriting recognition to improve an overall accuracy, in terms of throughput, of an automatic recognizer. The invention exploits a complementarity of acoustic and stroke information to provide method and apparatus having improved message recognition accuracy relative to either speech recognition or handwriting recognition alone (Bellagarda Col. 3 lines 53-61).

Further, Bellagarda teaches multi-dimensional vectors are employed to train the parameters of a set of combined word models, for a combined use of speech and handwriting, or to train two sets of word models, for separate use during speech and handwriting recognition. During use, the probabilities, or likelihoods, of each input feature vector are computed using the appropriate set(s) of word models to generate a list or lists of candidate words. A candidate word is selected as representing a message based upon criteria including the probability score and, for the separate-use message recognition system, two weighting factors derived during training of the models (Bellagarda Col. 4 lines 15-25).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Ditzik to incorporate improving the accuracy of the writing and speech recognizer by training the shared language model by resolving text and speech input from said speech recognizer in accordance with text and speech input from said writing and speech recognizers as taught by Bellagarda to allow for an integrated use of speech and handwriting recognition to improve an overall

accuracy, in terms of throughput, of an automatic recognizer, wherein the integration exploits a complementary use of acoustic and stroke information to provide method and apparatus having improved message recognition accuracy relative to either speech recognition or handwriting recognition alone (Bellagarda Col. 3 lines 53-61).

However, Baker fails to teach that when a current context of received user input cannot be determined (is ambiguous)

Selecting the current context from a plurality of provided contexts

Baker teaches that which is consistent with the specification of the present invention relative to context (present invention spec. page 49), wherein Baker explicitly teaches he invention provides methods and systems for speech recognition, optical character recognition, machine translation, and other recognition applications. Word recognition methods and systems are described herein which serve to identify a word that occurs in a passage of words. The passage can be any word sequence including an utterance, a portion of handwritten text, a portion of typewritten text or other such sequence of words, phrases, numbers and characters. In a further aspect, the invention is realized as a word recognition method that is implemented as a software module which controls a word recognition system that has access to an established reference source, such as a dictionary. The method can include a step of selecting from a reference source passages of words related to the choice words for the current word being recognized. To evaluate a choice word the method directs the system to access an established reference source, and select a passage or passages that contain

language suitable to represent the semantic profile of the respective choice word. This semantic profile can represent the contexts, topics, themes and meanings that are associated with this choice word. For example, the choice word "car" can have a semantic profile that can include synonyms of the noun "car" such as "automobile" or "vehicle", as well as including words related to the topics associated with the word "car" such as "transportation" or "mechanic". In a further step, the system compares the words in the selected passages with the context words in the document or utterance containing the current word (Baker Col. 6 lines 50-60).

Further, Baker teaches a system that employs context models of the context words 36 in a data string to select one of the choice words 20A-20E generated by the choice list generator 14. The data processor element 144 can include a program element that correlates the list of context words 86 with the choice words 20A-20E to select the proper choice for the current ambiguous word 38. As described above, the correlation between the words 86 and the choice words 20A-20E can include a heuristic process that selects a choice word 20A-20E by identifying occurrences of the selected choice word within one or more of the lists of words 86. (Baker Col. 23 lines 53-65).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Ditzik in view of Bellagarda to incorporate when a current context of received user input cannot be determined, wherein the accuracy of the shared language model is increased from received user input indicative of a correction selecting the current context from a plurality of provided contexts as taught by Baker to allow for the list availability of synonymous or an associated

topic/context, wherein for example word choice car can relate to mechanic or transportation, even though car, mechanic, and transportation are not synonymous and may not necessarily be of the same context (Baker Col. 6 lines 50-60).

Re claim 82, Ditzik teaches the system of claim 81 wherein the microphone is head mounted substantially beyond an immediate vicinity of the head of an individual (Col. 3 line 65 – Col. 4 line 17).

Re claim 85, Ditzik teaches the system of claim [[1]] 81 wherein:

(a) the speech recognizes recognizer provides text data without being responsive to freehand input supplied to the [[the]] handwriting recognizes recognizer (Fig. 1); and

(b) the handwriting recognizer provides text data without being responsive to voice input supplied to the [[the]] speech recognizer (Fig. 2)

Re claim 88, Ditzik teaches the system of claim 81, wherein at least one of said speech recognizer and said handwriting recognizer (Col. 5 lines 38-67, *pattern databases for stylus strokes*) is configured to be responsive to an identifying signal to select a particular user message model to use when generating text responsive to said voice input (Col. 3 lines 49-64 *phoneme models for speech input*).

Re claim 89, Ditzik teaches the system of claim 88, wherein said particular user message model is remotely available over a wide area network (Col. 8 lines 15-29).

Re claim 100, Ditzik teaches the method according to claim 99, further comprising accessing at least one of said shared language model, said acoustic model and said writing model (Col. 4 line 49 – Col. 5 line 2 & Fig. 2) via a network (Col. 8 lines 15-29).

However, Ditzik fails to teach a shared language model

Bellegarda teaches a message recognition system 10 constructed and operated in accordance with a first embodiment of the invention. As employed herein a message is considered to be information generated by a human subject and entered into the system 10, the information being entered through an acoustic signal, a handwritten stroke signal, or through a combination of acoustic and stroke signals. The information may represent individual characters, including numbers, letters of the alphabet, punctuation and the like. The information may also represent words, phrases, and paragraphs.

Additionally, Bellegarda teaches a feature vector that is a combination of FV.sub.S and FV.sub.H. The speech and handwriting feature vectors are each generated in response to simultaneously provided acoustic and handwriting input. In that the sampling rates and durations of the input are different for the speech and handwriting channels a normalization block 52 normalizes the two inputs to a common time base and combines the normalized feature vectors into a single feature vector.

This combination may be a synthetic concatenation of the four dimensional handwriting vector with the 20 dimensional speech vector, as indicated in FIG. 4e, to provide a 24 dimensional combined vector (FV.sub.S,H). (Bellegarda Col. 10 line 57 – Col. 11 line 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention accessing at least one of said shared language model, said acoustic model and said writing model via a network for the purposes of hand writing and speech complementing one another, wherein difficult pronunciations or spelling error may occur (i.e. a user can override writing a long word by just uttering the word itself).

5. Claim 83 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ditzik US 6167376 A (hereinafter Ditzik) in view of Bellegarda et al. US 6285785 B1 (Bellegarda) and Baker et al. US 6161091 A (hereinafter Baker) and further in view of Watterson et al US 4969180 A (hereinafter Watterson).

Re claim 83, Ditzik in view of Bellegarda and Baker fails to teach the system of claim 82 wherein the microphone is housed in the stylus

Watterson teaches a functional writing pen as a cordless handset incorporating a microphone and speaker unit, which can conveniently serve as both a pen and a telephone handset for normal telephone conversation (Watterson Col. 2 lines 11-20).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention a microphone housed in a stylus, wherein housing a microphone within a writing instrument such as a stylus or pen would allow for hands-free

communication with a speech recognition system to provide a more convenient means for a user to input data through by handwriting and/or speech and not holding a microphone in addition to a stylus.

6. **Claims 86, 92, and 98 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ditzik US 6167376 A (hereinafter Ditzik) in view of Bellegarda et al. US 6285785 B1 (Bellegarda) and Baker et al. US 6161091 A (hereinafter Baker) and further in view of Shim et al. US 6853850 B2 (hereinafter Shim).**

Re claim 86, Ditzik in view of Bellegarda and Baker fails to teach the system of claim 81, wherein said stylus is equipped with a proximity sensor that is configured to sense a proximity of a human head to said microphone

Shim teaches adjusting the speaker volume and/or the microphone gain to provide optimum audio signal levels for that situation. If the estimated sensor-head distance is greater than the reference distance, the system (1) adjusts the speaker volume and/or the microphone gain to its maximum signal level and/or (2) notifies the user that the maximum signal level may be inadequate to maintain acceptable audio communication and/or (3) disables the speaker and/or the microphone until the sensor-head distance is no greater than the reference distance or (4) takes no action. More than one proximity zone, each with its own reference distance and/or zone center, can be defined and sensed by the system. The minimum-to-maximum range for speaker volume and/or for microphone gain is adjustable for each user (Shim Col. 1 line 67 – Col. 2 line 22).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention stylus is equipped with a proximity sensor that is configured to sense a proximity of a human head to said microphone for the purposes of adjusting gain from a user, wherein ideal audio levels can be input into the processor for accurate speech recognition, wherein a minimum and maximum distance from the microphone can be implemented to establish thresholds.

Re claims 92 and 98, Ditzik in view of Bellegarda and Baker fails to teach the system of claim 81, further comprising an activation circuit that is configured to sense when a user moves said stylus away from said user's mouth and toward said tablet in order to configure said tablet for editing

Shim teaches adjusting the speaker volume and/or the microphone gain to provide optimum audio signal levels for that situation. If the estimated sensor-head distance is greater than the reference distance, the system (1) adjusts the speaker volume and/or the microphone gain to its maximum signal level and/or (2) notifies the user that the maximum signal level may be inadequate to maintain acceptable audio communication and/or (3) disables the speaker and/or the microphone until the sensor-head distance is no greater than the reference distance or (4) takes no action. More than one proximity zone, each with its own reference distance and/or zone center, can be defined and sensed by the system. The minimum-to-maximum range for speaker volume and/or for microphone gain is adjustable for each user (Shim Col. 1 line 67 – Col. 2 line 22).

If the microphone is housed within the stylus, then various zones can be implemented to measure the distance a person is from a microphone (i.e. stylus with microphone housed in it), wherein if the stylus is at a certain distance from the user, then the handwriting recognition system will be expecting the user to begin writing, and the speech recognition system will not.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention stylus is equipped with a proximity sensor that is configured to sense a proximity of a human head to said microphone for the purposes of adjusting gain from a user, wherein ideal audio levels can be input into the processor for accurate speech recognition, wherein a minimum and maximum distance from the microphone can be implemented to establish thresholds that can identify when the stylus is at a certain distance from the user for the handwriting recognition system to begin expecting the user to begin writing.

7. **Claims 87 and 93-96 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ditzik US 6167376 A (hereinafter Ditzik) in view of Bellegarda et al. US 6285785 B1 (Bellegarda) and Baker et al. US 6161091 A (hereinafter Baker) and further in view of Black US 6307956 B1 (hereinafter Black).**

Re claim 87, Ditzik in view of Bellegarda and Baker fails to teach the system of claim 81, wherein said stylus is equipped with an identification circuit that is configured to identify an owner of said stylus

Black teaches a stylus 15 includes one or more sensors 20 that capture biometric properties of the user. The computer (chip) 40 processes the captured information to determine whether to enable access to an account/network/entry, or other entry or privilege once identification has been confirmed. In one preferred embodiment, the system includes means to enable the user to enter a primary identifier, the identifier being a series of letters, digits, a spoken word converted to text (speech recognition), or the like. The primary identifier is preferably the user's printed name, the user's birthday (and year), zip code, mother's maiden name, or PIN or password. (Black Col. 10 line 28-39 & Fig. 1)

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention stylus is equipped with an identification circuit that is configured to identify an owner of said stylus for the purposes of preventing an unknown user from accessing specific user-trained models/databases, wherein information specific to a user must be input prior to operation speech and/or handwriting operations.

Re claim 93, Ditzik teaches the system of claim 81, wherein a user message model is an instantiation for a particular user of said shared language model, said acoustic model, and said handwriting model (Col. 3 lines 49-64).

However, Ditzik fails to teach a shared language model

Bellegarda teaches a message recognition system 10 constructed and operated in accordance with a first embodiment of the invention. As employed herein a message is considered to be information generated by a human subject and entered into the

system 10, the information being entered through an acoustic signal, a handwritten stroke signal, or through a combination of acoustic and stroke signals. The information may represent individual characters, including numbers, letters of the alphabet, punctuation and the like. The information may also represent words, phrases, and paragraphs.

Additionally, Bellegarda teaches a feature vector that is a combination of FV.sub.S and FV.sub.H. The speech and handwriting feature vectors are each generated in response to simultaneously provided acoustic and handwriting input. In that the sampling rates and durations of the input are different for the speech and handwriting channels a normalization block 52 normalizes the two inputs to a common time base and combines the normalized feature vectors into a single feature vector. This combination may be a synthetic concatenation of the four dimensional handwriting vector with the 20 dimensional speech vector, as indicated in FIG. 4e, to provide a 24 dimensional combined vector (FV.sub.S,H). (Bellegarda Col. 10 line 57 – Col. 11 line 7).

However, Ditzik in view of Bellegarda and Baker fails to teach a user message model is an instantiation for a particular user

Black teaches a stylus 15 includes one or more sensors 20 that capture biometric properties of the user. The computer (chip) 40 processes the captured information to determine whether to enable access to an account/network/entry, or other entry or privilege once identification has been confirmed. In one preferred embodiment, the system includes means to enable the user to enter a primary identifier, the identifier being a series of letters, digits, a spoken word converted to text (speech recognition), or

the like. The primary identifier is preferably the user's printed name, the user's birthday (and year), zip code, mother's maiden name, or PIN or password. (Black Col. 10 line 28-39 & Fig. 1)

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention a user message model is an instantiation for a particular user of said shared language model, said acoustic model, and said handwriting model for the purposes of hand writing and speech complementing one another, wherein difficult pronunciations or spelling error may occur (i.e. a user can override writing a long word by just uttering the word itself). Additionally, it would have been obvious to one of ordinary skill in the art at the time of the invention a user message model is an instantiation for a particular user for the purposes of preventing an unknown user from accessing specific user-trained models/databases, wherein information specific to a user must be input prior to operation speech and/or handwriting operations.

Re claim 94, Ditzik teaches the system of claim 93, wherein said user message model is local to said system (Col. 3 line 65 – Col. 4 line 17).

Re claim 95, Ditzik teaches the system of claim 94, wherein said user message model is implemented in a virtual machine (Col. 6 lines 32-58).

Re claim 96, Ditzik teaches the system of claim 93, wherein said user message model is remotely stored in a database (Col. 3 line 65 – Col. 4 line 17)

8. **Claims 90 and 91 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ditzik US 6167376 A (hereinafter Ditzik) in view of Bellegarda et al. US 6285785 B1 (Bellegarda) and Baker et al. US 6161091 A (hereinafter Baker) and further in view of Bellegarda US 5839106 A (hereinafter Bellegarda(2)).**

Re claim 90, Ditzik fails to teach the system of claim 81, further comprising a unified message model that includes said acoustic model, said handwriting model, and said shared language model, wherein said shared language model (Bellegarda Col. 5 lines 15-25 & Fig. 2 items 24 and 54) includes a syntactic model and a semantic model

Bellegarda teaches a message recognition system 10 constructed and operated in accordance with a first embodiment of the invention. As employed herein a message is considered to be information generated by a human subject and entered into the system 10, the information being entered through an acoustic signal, a handwritten stroke signal, or through a combination of acoustic and stroke signals. The information may represent individual characters, including numbers, letters of the alphabet, punctuation and the like. The information may also represent words, phrases, and paragraphs.

Additionally, Bellegarda teaches a feature vector that is a combination of FV.sub.S and FV.sub.H. The speech and handwriting feature vectors are each generated in response to simultaneously provided acoustic and handwriting input. In that the sampling rates and durations of the input are different for the speech and handwriting channels a normalization block 52 normalizes the two inputs to a common

time base and combines the normalized feature vectors into a single feature vector. This combination may be a synthetic concatenation of the four dimensional handwriting vector with the 20 dimensional speech vector, as indicated in FIG. 4e, to provide a 24 dimensional combined vector (FV.sub.S,H). (Bellegarda Col. 10 line 57 – Col. 11 line 7).

However, Ditzik in view of Bellegarda and Baker fails to teach a syntactic model and a semantic model

Bellegarda(2) teaches a hybrid recognition processor 220 might use an n-gram syntactic-type first model 310 to produce a list of candidate text messages from a sequence of feature vectors, and then employ a latent semantic-type second model 320 to rescore the list so that the most likely candidate, or hypothesis, is moved to the top of the list as necessary (Bellegarda(2) Col. 6 lines 51-67). Of course, such a sequential approach to integration will fail if the correct hypothesis is not included in the original list of candidates produced during the first recognition pass. Such failure may be prevented, however, by producing a relatively long list of candidates during the first pass, so that the original list is virtually guaranteed to include the correct hypothesis.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention a unified message model that includes said acoustic model, said handwriting model, and said shared language model, wherein said shared language model includes a syntactic model and a semantic model for the purposes of hand writing and speech complementing one another, wherein difficult pronunciations or spelling error may occur (i.e. a user can override writing a long word by just uttering the word itself). Additionally, it would have been obvious to one of ordinary skill in the art at

the time of the invention a semantic and syntactic model for the purposes of further correcting a ranked list of potential candidates by analyzing the context and grammar rules for a language to receive speech or handwriting, wherein the best candidate can be selected to be generated as text while conserving memory resources.

Re claim 91, Ditzik in view of Bellegarda and Baker fails to teach the system of claim 90, wherein said semantic model comprises at least one of:

(a) a semantic cluster of a first type that is a mathematically derived group of vectors representing text segments (Bellegarda(2) Col. 6 lines 51-67);

(b) a semantic cluster of a second type that is a discrete grouping of text that has a particular context; and

(c) a semantic cluster of a third type that is defined with respect to an individual reference word that is considered to be indicative of a particular context.

Bellegarda(2) teaches a hybrid recognition processor 220 might use an n-gram syntactic-type first model 310 to produce a list of candidate text messages from a sequence of feature vectors, and then employ a latent semantic-type second model 320 to rescore the list so that the most likely candidate, or hypothesis, is moved to the top of the list as necessary (Bellegarda(2) Col. 6 lines 51-67). Of course, such a sequential approach to integration will fail if the correct hypothesis is not included in the original list of candidates produced during the first recognition pass. Such failure may be prevented, however, by producing a relatively long list of candidates during the first pass, so that the original list is virtually guaranteed to include the correct hypothesis.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention a semantic cluster of a first type that is a mathematically derived group of vectors representing text segments for the purposes of further correcting a ranked list of potential candidates by analyzing the context and grammar rules for a language to receive speech or handwriting, wherein the best candidate can be selected to be generated as text while conserving memory resources.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael C. Colucci whose telephone number is (571)-270-1847. The examiner can normally be reached on 9:30 am - 6:00 pm, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571)-272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael C Colucci/
Examiner, Art Unit 2626
Patent Examiner
AU 2626
(571)-270-1847
Michael.Colucci@uspto.gov

/Richemond Dorvil/
Supervisory Patent Examiner, Art Unit 2626

Notice of References Cited	Application/Control No. 11/088,032	Applicant(s)/Patent Under Reexamination SUOMINEN, EDWIN A.	
	Examiner MICHAEL C. COLUCCI	Art Unit 2626	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,680,511 A	10-1997	Baker et al.	704/257
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

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

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

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11088032	SUOMINEN, EDWIN A.
	Examiner	Art Unit
	Colucci, Michael C	2626

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/05/2007	06/04/2008	11/07/2008	04/16/2009					
	81	✓	✓	✓	✓					
	82	✓	✓	✓	✓					
	83	✓	✓	✓	✓					
	84	✓	✓	-	-					
	85	✓	✓	✓	✓					
	86		✓	✓	✓					
	87		✓	✓	✓					
	88		✓	✓	✓					
	89		✓	✓	✓					
	90		✓	✓	✓					
	91		✓	✓	✓					
	92		✓	✓	✓					
	93		✓	✓	✓					
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	98		✓	✓	✓					
	99		✓	✓	✓					
	100		✓	✓	✓					
	101			✓	✓					
	102			✓	✓					

Index of Claims	Application/Control No. 11088032	Applicant(s)/Patent Under Reexamination SUOMINEN, EDWIN A.
	Examiner Colucci, Michael C	**Art Unit** 2626

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/05/2007	06/04/2008	11/07/2008	04/16/2009					

U.S. Patent and Trademark Office Part of Paper No. : 20090416

Index of Claims	Application/Control No. 11088032	Applicant(s)/Patent Under Reexamination SUOMINEN, EDWIN A.
	Examiner Colucci, Michael C	**Art Unit** 2626

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ **Claims renumbered in the same order as presented by applicant** ☐ **CPA** ☐ **T.D.** ☐ **R.1.47**

CLAIM		DATE								
Final	Original	11/05/2007	06/04/2008	11/07/2008	04/16/2009					

U.S. Patent and Trademark Office

Part of Paper No. : 20090416

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11088032	SUOMINEN, EDWIN A.
	Examiner	Art Unit
	Colucci, Michael C	2626

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/05/2007	06/04/2008	11/07/2008	04/16/2009					

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11088032	SUOMINEN, EDWIN A.
	Examiner	Art Unit
	Colucci, Michael C	2626

SEARCHED

Class	Subclass	Date	Examiner
382	187	11/5/2007	MC
704	256, 270	11/5/2007	MC
704	235, 257	6/4/2008	MC
379	56.1	6/4/2008	MC
382	124, 187	6/4/2008	MC
455	550.1	6/4/2008	MC
704	257	4/16/2009	MC

SEARCH NOTES

Search Notes	Date	Examiner
Searched 382/187 with keyword limitations	11/5/2007	MC
Searched 704/256 with keyword limitations	11/5/2007	MC
Searched 704/270 with keyword limitations	11/5/2007	MC
Consulted SPE Richemond Dorvil	11/5/2007	MC
Searched 704/235 with keyword limitations	6/4/2008	MC
Searched 704/257 with keyword limitations	6/4/2008	MC
Searched 379/56.1 with keyword limitations	6/4/2008	MC
Searched 382/124 with keyword limitations	6/4/2008	MC
Searched 455/550.1 with keyword limitations	6/4/2008	MC
Searched 382/187 with keyword limitations	6/4/2008	MC
Performed a double patenting search	5/27/2008	MC
Performed an inventors search	5/27/2008	MC
Consulted SPE Richemond Dorvil	5/27/2008	MC
Consulted Primary Examiner Talivaldis Smits	5/27/2008	MC
Checked the spec. for "medium" - not a signal	11/7/2008	MC
Searched 704/257 with keyword limitations	4/16/2009	MC

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L12	16	11 and contextual and hand$5writ$7	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2009/04/16 14:29
L11	476	(704/257).CCLS.	USPAT; USOCR; EPO	OR	OFF	2009/04/16 14:28
L7	18	5 and 6	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2009/04/16 13:42
L6	18506	("704").CLAS.	USPAT; USOCR; EPO	OR	OFF	2009/04/16 13:42
L5	119	context$5 with ambigu$7 with select$6	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2009/04/16 13:42

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PTO/SB/30EFS (01-09)
Approved for use through 02/28/2009. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	11/088,032	Filing Date	2005-03-22	Docket Number (if applicable)	**OR-0005	Art Unit	2626
First Named Inventor	Edwin A. Suominen			Examiner Name	Michael C. Colucci		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ☐ Other _____

☒ Enclosed

- ☒ Amendment/Reply
- ☐ Information Disclosure Statement (IDS)
- ☐ Affidavit(s)/ Declaration(s)
- ☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____ (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

☒ **The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.**
The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 233050

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

PTO/SB/30EFS (01-09)
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Signature	/Peter Trahms-Neudorfer/	Date (YYYY-MM-DD)	2009-02-13
Name	Peter Trahms-Neudorfer	Registration Number	59282

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: **Edwin A. Suominen**	Confirmation No.: **6401**
Application No.: **11/088,032**	Group Art Unit: **2626**
Filing Date: **March 22, 2005**	Examiner: **Michael C. Colucci**

For: **Message Recognition Using Shared Language Model**

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

Sir:

REPLY PURSUANT TO 37 CFR § 1.116

In response to the Official Action dated **November 13, 2008**, reconsideration is respectfully requested in view of the amendments and/or remarks as indicated below:

☐ **Amendments to the Specification** begin on page of this paper.

☒ **Amendments to the Claims** are reflected in the listing of the claims which begins on page 2 of this paper.

☐ **Amendments to the Drawings** begin on page of this paper and include an attached replacement sheet.

☒ **Remarks** begin on page 8 of this paper.

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

Listing of Claims:

Claims 1-80 (canceled)

Claim 81 (currently amended) A system for generating text responsive to both voice and handwriting input, comprising:

[[(a)]] a microphone;

[[(b)]] a stylus;

[[(c)]] a tablet including (1) a tablet surface, (2) a flat-panel display integrated into the tablet surface and responsive to freehand input conveyed via manipulation of the stylus on or near the tablet surface to render ink-like indicia of the freehand input, and (3) a message recognizer including a speech recognizer and a handwriting recognizer;

[[(d)]] wherein the speech recognizer is responsive to voice input conveyed via the microphone to provide text data in accordance with both a shared language model and an acoustic model;

[[(e)]] when a current context of received user input cannot be determined, wherein the accuracy of the shared language model is increased from received user input indicative of ~~a correction~~ selecting the current context from a plurality of provided contexts, the received user input obtained from a speech recognizer or a handwriting recognizer; and

[[(f)]] the handwriting recognizer is responsive to freehand input conveyed via the stylus to provide text data in accordance with both the shared language model and a handwriting model.

Claim 82 (previously presented) The system of claim 81 wherein the microphone is mounted substantially beyond an immediate vicinity of the head of an individual.

Claim 83 (previously presented) The system of claim 82 wherein the microphone is housed in the stylus.

Claim 84 (Cancelled)

Claim 85 (currently amended) The system of claim 81 wherein:

[[(a)]] the speech recognizer provides text data without being responsive to freehand input supplied to the handwriting recognizer; and

[[(b)]] the handwriting recognizer provides text data without being responsive to voice input supplied to the speech recognizer.

Claim 86 (previously presented) The system of claim 81, wherein said stylus is equipped with a proximity sensor that is configured to sense a proximity of a human head to said microphone.

Claim 87 (previously presented) The system of claim 81, wherein said stylus is equipped with an identification circuit that is configured to identify an owner of said stylus.

Claim 88 (previously presented) The system of claim 81, wherein at least one of said speech recognizer and said handwriting recognizer is configured to be responsive to an identifying signal to select a particular user message model to use when generating text responsive to said voice input.

Claim 89 (previously presented) The system of claim 88, wherein said particular user message model is remotely available over a wide area network.

Claim 90 (previously presented) The system of claim 81, further comprising a unified message model that includes said acoustic model, said handwriting model, and said shared language model, wherein said shared language model includes a syntactic model and a semantic model.

Claim 91 (currently amended) The system of claim 90, wherein said semantic model comprises at least one of:

[[(a)]] a semantic cluster of a first type that is a mathematically derived group of vectors representing text segments;

[[(b)]] a semantic cluster of a second type that is a discrete grouping of text that has a

particular context; and

[[(c)]] a semantic cluster of a third type that is defined with respect to an individual reference word that is considered to be indicative of a particular context.

Claim 92 (previously presented) The system of claim 81, further comprising an activation circuit that is configured to sense when a user moves said stylus away from said user's mouth and toward said tablet in order to configure said tablet for editing.

Claim 93 (previously presented) The system of claim 81, wherein a user message model is an instantiation for a particular user of said shared language model, said acoustic model, and said handwriting model.

Claim 94 (previously presented) The system of claim 93, wherein said user message model is local to said system.

Claim 95 (previously presented) The system of claim 94, wherein said user message model is implemented in a virtual machine.

Claim 96 (previously presented) The system of claim 93, wherein said user message model is remotely stored in a database.

Claim 97 (currently amended) A method for generating text responsive to both voice and handwriting input, comprising:

Activating, by a device comprising a processor, a display, a pressure-sensitive region and a microphone, a speech recognizer and a handwriting recognizer;

Processing, by the device, with said speech recognizer voice input conveyed via a microphone to provide a first text data in accordance with both a shared language model and an acoustic model;

determining, by the device, that a context of a word of the voice input cannot be determined;

providing, by the device, a plurality of possible contexts for the word;

processing, by the device, with said handwriting recognizer hand input conveyed via a stylus to provide a the context for the word ~~second text data~~ in accordance with both

the shared language model and a handwriting model; and

generating, by the device, a third text data based on a combination of said speech recognizer processing and said handwriting recognizer processing; and

improving, by the device, the accuracy of said handwriting recognizer by training the handwriting recognizer in response to user correction by the speech recognizer.

Claim 98 (previously presented) The method according to claim 97, further comprising switching modes from processing input with said speech recognizer to processing input with said handwriting recognizer when said stylus moves away from a user's mouth and towards a tablet.

Claim 99 (currently amended) A method for receiving and processing a plurality of different types of input and converting said inputs into text data, comprising:

receiving, by electronics, voice input, wherein said voice input is conveyed via a stylus mounted microphone;

~~receiving writing input, wherein said writing input is conveyed via a tablet surface;~~

responding, by the electronics, to said voice input with a speech recognizer, wherein said speech recognizer is configured to provide text data in accordance with both a shared language model and an acoustic model;

determining, by the electronics, that a context of a word of said voice input is ambiguous;

providing, by the electronics, a plurality of available contexts for the word;

receiving, by the electronics, writing input, wherein said writing input is indicative of the context for the word, the context being one of the available contexts;

responding, by the electronics, to said writing input with a writing recognizer, wherein said writing recognizer is configured to provide text data in accordance with both the shared language model and a writing model;

- ~~improving the accuracy of the writing recognizer by training the shared language model by resolving text input from said speech recognizer in accordance with text input from said writing recognizer; and~~

improving, by the electronics, the accuracy of the speech recognizer by training the shared language model by resolving text input from said writing recognizer in accordance

with text input from said speech recognizer.

Claim 100 (previously presented) The method according to claim 99, further comprising accessing at least one of said shared language model, said acoustic model and said writing model via a network.

Claim 101 (currently amended) A computer readable storage medium, comprising instructions that when executed on a processor cause the processor to perform the steps of:

~~receiving voice input;~~

receiving writing input;

responding to said voice input with a speech recognizer, wherein said speech recognizer is configured to provide text data in accordance with both a shared language model and an acoustic model;

determining that a context of a word of said voice input is ambiguous;

providing a plurality of possible contexts for the word;

receiving writing input, wherein said writing input is indicative of a context for the word, the context being one of the possible contexts;

responding to said writing input with a writing recognizer, wherein said writing recognizer is configured to provide text data in accordance with both the shared language model and a writing model; and

~~increasing the accuracy of the writing recognizer by training the shared language model by resolving text input from said speech recognizer in accordance with text input from said writing recognizer; and~~

increasing the accuracy of the speech recognizer by training the shared language model by resolving text input from said writing recognizer in accordance with text input from said speech recognizer.

Claim 102 (currently amended) An apparatus for generating text responsive to both voice and handwriting input, comprising:

~~means for receiving voice input;~~

means for receiving writing input;

means for responding to said voice input with a speech recognizer, wherein said speech recognizer is configured to provide text data in accordance with both a shared language model and an acoustic model;

means for determining that a context of a word of said voice input is ambiguous;

means for providing a plurality of possible contexts for the word;

means for receiving writing input, wherein said writing input is indicative of the context for the word, the context being one of the possible contexts;

means for responding to said writing input with a writing recognizer, wherein said writing recognizer is configured to provide text data in accordance with both the shared language model and a writing model; and

~~means for increasing the accuracy of the writing recognizer by training the shared language model by resolving text input from said speech recognizer in accordance with text input from said writing recognizer; and~~

means for increasing the accuracy of the speech recognizer by training the shared language model by resolving text input from said writing recognizer in accordance with text input from said speech recognizer.

REMARKS

Claims 81-83 and 85-102 are pending in the present application. Claims 81-83 and 85-102 stand rejected. Claims 81, 97, 99, 101 and 102 are the independent claims.

Claim Rejections – 35 USC § 103

Claims 81, 82, 85, 88, 89, 97 and 99-102 stand rejected under 35 USC 103(a) as being unpatentable over Ditzik (Pat. No. 6,167,376) in view of Bellegarda et al. (Pat. No. 6,285,785, hereinafter "Bellegarda").

Representative independent claim 81 has been amended to include new limitations. This new claim language reads, in part, "when a current context of received user input cannot be determined, wherein the accuracy of the shared language model is increased from received user input indicative of ~~a correction~~ selecting the current context from a plurality of provided contexts, the received user input obtained from a speech recognizer or a handwriting recognizer." This is supported by the specification in at least paragraph [0093]. Applicants respectfully submit that their Ditzik nor Bellegarda teaches at least this limitation.

Ditzik does not appear to disclose context determination of voice input. Further, the reference appears to determine context based solely on the handwriting input that the user wishes to add to a text. It does not use handwriting input about other handwriting input ("meta handwriting input," to coin a term here) such as the claimed "received user input indicative of selecting the proper context from a plurality of provided contexts" to determine the proper context.

Further, Bellegarda appears to be directed only towards an input recognizer that accepts both written and aural input. Bellegarda appears to make no reference to determining what an input represents based on the context of that input.

For at least the above reasons, applicant respectfully submits that independent claim 81 is in condition for allowance, as are dependent claims 82-83 and 85-96.

Claim 97 has been amended to recite that the operations are performed by "a device comprising a processor, a display, a pressure-sensitive region and a microphone." This is supported in the specification in at least paragraphs [0041]-[0043].

Independent claims 97, 99, 101 and 102 have been amended to include limitations similar to those found in amended claim 81. For reasons similar to the above, applicant respectfully submits that claims 97, 99, 101 and 102 are in condition for allowance, as are claims 98 and 100, which depend from claims 97 and 99, respectively.

Claim 83 stands rejected under 35 USC 103(a) as being unpatentable over Ditzik in view of Bellegarda, and further in view of Watterson et al. (Pat No. 4,969,180). Applicant respectfully submits that Watterson fails to disclose or suggest those elements of independent claim 81 that are missing from Ditzik in view of Bellegarda. For at least the above reasons, applicant respectfully submits that claim 83 is in condition for allowance.

Claims 86, 92 and 98 stand rejected under 35 USC 103(a) as being unpatentable over Ditzik in view of Bellegarda, and further in view of Shim (Pat. No. 6,853,850). Applicant respectfully submits that Shim fails to disclose or suggest those elements of independent claims 81 (with respect to claims 86 and 92) and 97 (with respect to claim 98) that are missing from Ditzik in view of Bellegarda. For at least the above reasons, applicant respectfully submits that claims 86, 92 and 98 are in condition for allowance.

Claims 87 and 93-96 stand rejected under 35 USC 103(a) as being unpatentable over Ditzik in view of Bellegarda, and further in view of Black (Pat. No. 6,307,956). Applicant respectfully submits that Black fails to disclose or suggest those elements of independent claim 81 that are missing from Ditzik in view of Bellegarda. For at least the above reasons, applicant respectfully submits that claims 87 and 93-96 are in condition for allowance.

Claims 90 and 91 stand rejected under 35 USC 103(a) as being unpatentable over Ditzik in view of Bellegarda, and further in view of a second Bellegarda patent (Pat. No. 5,839,106; hereinafter "Bellegarda(2)"). Applicant respectfully submits that Bellegarda(2) fails to disclose or suggest those elements of independent claim 81 that are missing from Ditzik in view of Bellegarda.

Bellegarda(2) appears to disclose a hybrid language model that is developed using an integrated paradigm in which latent semantic analysis is combined with, and subordinated to, a conventional N-gram paradigm. The integrated paradigm provides an estimate of the likelihood that a word, chosen from an underlying vocabulary, will occur given a prevailing contextual history. However, Bellegarda(2) does not appear to disclose handwriting input

about handwriting input ("meta handwriting input," as the term was coined in this reply, *supra*) such as the claimed "received user input indicative of selecting the proper context from a plurality of provided contexts" of claim 81 to determine the proper context.

For at least the above reasons, applicant respectfully submits that claims 90-91 are in condition for allowance.

Date: February 13, 2009

/Peter Trahms-Neudorfer/
Peter Trahms-Neudorfer
Registration No. 59,282

Woodcock Washburn LLP
Cira Centre
2929 Arch Street, 12th Floor
Philadelphia, PA 19104-2891
Telephone: (215) 568-3100
Facsimile: (215) 568-3439

Electronic Patent Application Fee Transmittal	
Application Number:	11088032
Filing Date:	22-Mar-2005
Title of Invention:	Message recognition using shared language model
First Named Inventor/Applicant Name:	Edwin A. Suominen
Filer:	Peter Trahms-Neudorfer
Attorney Docket Number:	**OR-0005
Filed as Large Entity	

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Request for continued examination	1801	1	810	810
		Total in USD ($)		**810**

Electronic Acknowledgement Receipt	
EFS ID:	4793072
Application Number:	11088032
International Application Number:	
Confirmation Number:	6401
Title of Invention:	Message recognition using shared language model
First Named Inventor/Applicant Name:	Edwin A. Suominen
Customer Number:	23377
Filer:	Peter Trahms-Neudorfer
Filer Authorized By:	
Attorney Docket Number:	**OR-0005
Receipt Date:	13-FEB-2009
Filing Date:	22-MAR-2005
Time Stamp:	16:14:20
Application Type:	Utility under 35 USC 111(a)

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RAM confirmation Number	1542
Deposit Account	233050
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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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Warnings:					
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2		asfiledresponse.PDF	120064 b4198c622abd62c736a64bf831a612621db e90e3	yes	10

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment After Final	1	1
	Claims	2	7
	Applicant Arguments/Remarks Made in an Amendment	8	10

Warnings:					
Information:					
3	Fee Worksheet (PTO-06)	fee-info.pdf	29782 f76c91821a6edcf01762cd860d428b1d6e4c2100	no	2
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PTO/SB/06 (07-06)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 11/088,032	Filing Date 03/22/2005	☐ To be Mailed

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☐		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

		(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
	02/13/2009	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
AMENDMENT	Total (37 CFR 1.16(i))	* 21	Minus	** 21	= 0	X $ =		OR	X $52=	0
	Independent (37 CFR 1.16(h))	* 5	Minus	***5	= 0	X $ =		OR	X $220=	0
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	**0**

		(Column 1)		(Column 2)	(Column 3)					
		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
AMENDMENT	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L 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.

Legal Instrument Examiner:
/JOY DOBBS/

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/088,032	03/22/2005	Edwin A. Suominen	**OR-0005	6401

23377 7590 11/13/2008

WOODCOCK WASHBURN LLP
CIRA CENTRE, 12TH FLOOR
2929 ARCH STREET
PHILADELPHIA, PA 19104-2891

EXAMINER	
COLUCCI, MICHAEL C	
ART UNIT	**PAPER NUMBER**
2626	

MAIL DATE	DELIVERY MODE
11/13/2008	PAPER

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

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	11/088,032	SUOMINEN, EDWIN A.	
	Examiner	Art Unit	
	MICHAEL C. COLUCCI	2626	

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

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

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

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

Disposition of Claims

4)☒ Claim(s) *81-83 and 85-102* is/are pending in the application.

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

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *81-83 and 85-102* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

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

Application Papers

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

10)☒ The drawing(s) filed on *22 March 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

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

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

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

Priority under 35 U.S.C. § 119

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

a)☐ All b)☐ Some * c)☒ None of:

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

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

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

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

Attachment(s)

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

DETAILED ACTION

NOTE: Examiner acknowledges the cancellation of claim 84.

Response to Arguments

1. Applicant's arguments filed 09/09/2008 have been fully considered but they are not persuasive.

Argument 1 (page 8 paragraph 3 and page 9 paragraph 1):

- "Applicant believes that Bellagarda fails to teach or suggest any improvement of the accuracy of a shared language model, and that independent claim 81 is therefore in condition for allowance"
- "Applicants respectfully disagree. Ditzik appears to disclose correcting errors after they occur using text input, but not improving the accuracy of a shared language model to avoid errors in the shared language model the future by correcting errors after they occur, and also not improving the accuracy of each of a speech recognizer and a handwriting recognizer by training a shared language model"

Response to argument 1:

Examiner takes the position that Ditzik teaches a computer system's display screen, with a new unique computer telephony application program. In this disclosure, telephony includes telephone-like connections to communication networks such as telephone, Internet, and cable networks. This system makes use of pen/stylus input means and speech input means, with both handwriting

and speech recognition functions enabled (turned on) at the same time. The screen shows the name of the caller (via a caller ID function), the name of the answering party, date and time. The audio signal for the speech may sent to a speaker so that the user ca listen the speech information; the user may then make one or more decisions on the system setup options desire, as shown in menus 39. Speech data from both the caller and local user may captured, digitized, processed, recognized and displayed on the screen at near realtime. Since speech recognition is not perfect, recognition errors and omissions may be displayed along with the correctly recognized text. Recognition of the caller speech over the phone lines may be slightly worse than the local user's speech. As these recognition errors are observed by the viewer, he/she may use the pen or stylus to correct these speech recognition errors or omissions by direct hand writing on a writing pad or on the screen. The speech recognition errors on the screen are represented in the figure by corrections 38, 38A, 38B, 38C, 38D, and 38E. The user may quickly and efficiently make editing marks (inking) with the pen, as shown. The pen marks and handwriting may be recognized immediately, but could be displayed after a delay interval selected by the user. The user, viewing the text of the two-way conversations, can make editing marks without losing concentration on what is being said during the telephone call or audio input. In an alternative embodiment, the user may have the option to delay the display of recognized handwriting data until the user provides a command action, perhaps by click an icon or menu item (Ditzik Col. 7 lines 19-65).

However, Ditzik in view of Bellagarda teaches that the foregoing and other problems are overcome and the objects of the invention are realized by method and apparatus that employs an integrated use of speech and handwriting recognition to improve an overall accuracy, in terms of throughput, of an automatic recognizer. The invention exploits a complementarity of acoustic and stroke information to provide method and apparatus having improved message recognition accuracy relative to either speech recognition or handwriting recognition alone (Bellagarda Col. 3 lines 53-61).

Further, Bellagarda teaches multi-dimensional vectors are employed to train the parameters of a set of combined word models, for a combined use of speech and handwriting, or to train two sets of word models, for separate use during speech and handwriting recognition. During use, the probabilities, or likelihoods, of each input feature vector are computed using the appropriate set(s) of word models to generate a list or lists of candidate words. A candidate word is selected as representing a message based upon criteria including the probability score and, for the separate-use message recognition system, two weighting factors derived during training of the models (Bellagarda Col. 4 lines 15-25).

Furthermore, Bellagarda teaches the improvement of both speech and handwriting, wherein Bellagarda teaches operating an automatic message

recognition system. In accordance with the method the following steps are executed: a user's speech is converted to a first signal; a user's handwriting is converted to a second signal; and the first signal and the second signal are processed to decode a consistent message, conveyed separately by the first signal and by the second signal, or conveyed jointly by the first signal and the second signal. The step of processing includes the steps of converting the first signal into a plurality of first multi-dimensional vectors and converting the second signal into a plurality of second multi-dimensional vectors. For a system employing a combined use of speech and handwriting the step of processing includes a further step of combining individual ones of the plurality of first multi-dimensional vectors and individual ones of the plurality of second multi-dimensional vectors to form a plurality of third multi-dimensional vectors. The multi-dimensional vectors are employed to train a single set of word models, for joint use of speech and handwriting, or two sets of word models, for sequentially employed or merged speech and handwriting (Bellagarda Abstract).

Claim Rejections - 35 USC § 103

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

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 81, 82, 85, 88, 89, 97, and 99-102 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ditzik US 6167376 A (hereinafter Ditzik) in view of Bellegarda et al. US 6285785 B1 (Bellegarda).

Re claims 81, 97, 99, 101, and 102, Ditzik teaches a system for generating text responsive to both voice and handwriting input, comprising:

(a) a microphone (Col. 2 line 65 – Col. 3 line 18);

(b) a stylus (Fig. 2 item 10); [[and]]

(c) a tablet including (1) a tablet surface, (2) a flat-panel display integrated into the tablet surface and responsive to freehand input conveyed via manipulation of the stylus on or near the tablet surface to render ink-like indicia of the freehand input, and (3) a message recognizer including a speech recognizer and a handwriting recognizer (Col. 4 line 49 – Col. 5 line 2 & Fig. 2);

(d) wherein the speech recognizer is responsive to voice input conveyed via the microphone to provide text data in accordance with both a shared language model and an acoustic model (Col. 3 lines 49-64);

(e) the handwriting recognizer is responsive to freehand input conveyed via the stylus to provide text data in accordance with both the shared language model and a handwriting model (Col. 5 lines 38-67)

However, Ditzik fails to teach a shared language model and an acoustic model (Bellegarda Col. 5 lines 15-25 & Fig. 2 items 26 and 54)

shared language model and a handwriting model (Bellegarda Col. 5 lines 15-25 & Fig. 2 items 24 and 54)

improving the accuracy of the writing and speech recognizer by training the shared language model by resolving text and speechinput from said speech recognizer in accordance with text and speech input from said writing and speech recognizers

Bellegarda teaches a message recognition system 10 constructed and operated in accordance with a first embodiment of the invention. As employed herein a message is considered to be information generated by a human subject and entered into the system 10, the information being entered through an acoustic signal, a handwritten stroke signal, or through a combination of acoustic and stroke signals. The information may represent individual characters, including numbers, letters of the alphabet, punctuation and the like. The information may also represent words, phrases, and paragraphs.

Additionally, Bellegarda teaches a feature vector that is a combination of FV.sub.S and FV.sub.H. The speech and handwriting feature vectors are each generated in response to simultaneously provided acoustic and handwriting input. In that the sampling rates and durations of the input are different for the speech and handwriting channels a normalization block 52 normalizes the two inputs to a common time base and combines the normalized feature vectors into a single feature vector. This combination may be a synthetic concatenation of the four dimensional handwriting vector with the 20 dimensional speech vector, as indicated in FIG. 4e, to provide a 24 dimensional combined vector (FV.sub.S,H). (Bellegarda Col. 10 line 57 – Col. 11 line 7).

Bellagarda also teaches that the foregoing and other problems are overcome and the objects of the invention are realized by method and apparatus that employs an

integrated use of speech and handwriting recognition to improve an overall accuracy, in terms of throughput, of an automatic recognizer. The invention exploits a complementarity of acoustic and stroke information to provide method and apparatus having improved message recognition accuracy relative to either speech recognition or handwriting recognition alone (Bellagarda Col. 3 lines 53-61).

Further, Bellagarda teaches multi-dimensional vectors are employed to train the parameters of a set of combined word models, for a combined use of speech and handwriting, or to train two sets of word models, for separate use during speech and handwriting recognition. During use, the probabilities, or likelihoods, of each input feature vector are computed using the appropriate set(s) of word models to generate a list or lists of candidate words. A candidate word is selected as representing a message based upon criteria including the probability score and, for the separate-use message recognition system, two weighting factors derived during training of the models (Bellagarda Col. 4 lines 15-25).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Ditzikto incorporate improving the accuracy of the writing and speech recognizer by training the shared language model by resolving text and speechinput from said speech recognizer in accordance with text and speech input from said writing and speech recognizers as taught by Bellagarda to allow for an integrated use of speech and handwriting recognition to improve an overall accuracy, in terms of throughput, of an automatic recognizer, wherein the integration exploits a complementary use of acoustic and stroke information to provide method and apparatus

having improved message recognition accuracy relative to either speech recognition or handwriting recognition alone (Bellagarda Col. 3 lines 53-61).

Re claim 82, Ditzik teaches the system of claim 81 wherein the microphone is head mounted substantially beyond an immediate vicinity of the head of an individual (Col. 3 line 65 – Col. 4 line 17).

Re claim 85, Ditzik teaches the system of claim [[1]] 81 wherein:

(a) the speech recognizes recognizer provides text data without being responsive to freehand input supplied to the [[the]] handwriting recognizes recognizer (Fig. 1); and

(b) the handwriting recognizer provides text data without being responsive to voice input supplied to the [[the]] speech recognizer (Fig. 2)

Re claim 88, Ditzik teaches the system of claim 81, wherein at least one of said speech recognizer and said handwriting recognizer (Col. 5 lines 38-67, *pattern databases for stylus strokes*) is configured to be responsive to an identifying signal to select a particular user message model to use when generating text responsive to said voice input (Col. 3 lines 49-64 *phoneme models for speech input*).

Re claim 89, Ditzik teaches the system of claim 88, wherein said particular user message model is remotely available over a wide area network (Col. 8 lines 15-29).

Re claim 100, Ditzik teaches the method according to claim 99, further comprising accessing at least one of said shared language model, said acoustic model and said writing model (Col. 4 line 49 – Col. 5 line 2 & Fig. 2) via a network (Col. 8 lines 15-29).

However, Ditzik fails to teach a shared language model

Bellegarda teaches a message recognition system 10 constructed and operated in accordance with a first embodiment of the invention. As employed herein a message is considered to be information generated by a human subject and entered into the system 10, the information being entered through an acoustic signal, a handwritten stroke signal, or through a combination of acoustic and stroke signals. The information may represent individual characters, including numbers, letters of the alphabet, punctuation and the like. The information may also represent words, phrases, and paragraphs.

Additionally, Bellegarda teaches a feature vector that is a combination of FV.sub.S and FV.sub.H. The speech and handwriting feature vectors are each generated in response to simultaneously provided acoustic and handwriting input. In that the sampling rates and durations of the input are different for the speech and handwriting channels a normalization block 52 normalizes the two inputs to a common time base and combines the normalized feature vectors into a single feature vector. This combination may be a synthetic concatenation of the four dimensional handwriting

vector with the 20 dimensional speech vector, as indicated in FIG. 4e, to provide a 24 dimensional combined vector (FV.sub.S,H). (Bellegarda Col. 10 line 57 – Col. 11 line 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention accessing at least one of said shared language model, said acoustic model and said writing model via a network for the purposes of hand writing and speech complementing one another, wherein difficult pronunciations or spelling error may occur (i.e. a user can override writing a long word by just uttering the word itself).

4. Claim 83 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ditzik US 6167376 A (hereinafter Ditzik) in view of Bellegarda et al. US 6285785 B1 (Bellegarda) and further in view of Watterson et al US 4969180 A (hereinafter Watterson).

Re claim 83, Ditzik in view of Bellegarda fails to teach the system of claim 82 wherein the microphone is housed in the stylus

Watterson teaches a functional writing pen as a cordless handset incorporating a microphone and speaker unit, which can conveniently serve as both a pen and a telephone handset for normal telephone conversation (Watterson Col. 2 lines 11-20).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention a microphone housed in a stylus, wherein housing a microphone within a writing instrument such as a stylus or pen would allow for hands-free communication with a speech recognition system to provide a more convenient means

for a user to input data through by handwriting and/or speech and not holding a microphone in addition to a stylus.

5. **Claims 86, 92, and 98 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ditzik US 6167376 A (hereinafter Ditzik) in view of Bellegarda et al. US 6285785 B1 (Bellegarda) and further in view of Shim et al. US 6853850 B2 (hereinafter Shim).**

Re claim 86, Ditzik in view of Bellegarda fails to teach the system of claim 81, wherein said stylus is equipped with a proximity sensor that is configured to sense a proximity of a human head to said microphone

Shim teaches adjusting the speaker volume and/or the microphone gain to provide optimum audio signal levels for that situation. If the estimated sensor-head distance is greater than the reference distance, the system (1) adjusts the speaker volume and/or the microphone gain to its maximum signal level and/or (2) notifies the user that the maximum signal level may be inadequate to maintain acceptable audio communication and/or (3) disables the speaker and/or the microphone until the sensor-head distance is no greater than the reference distance or (4) takes no action. More than one proximity zone, each with its own reference distance and/or zone center, can be defined and sensed by the system. The minimum-to-maximum range for speaker volume and/or for microphone gain is adjustable for each user (Shim Col. 1 line 67 – Col. 2 line 22).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention stylus is equipped with a proximity sensor that is configured to sense a proximity of a human head to said microphone for the purposes of adjusting gain from a user, wherein ideal audio levels can be input into the processor for accurate speech recognition, wherein a minimum and maximum distance from the microphone can be implemented to establish thresholds.

Re claims 92 and 98, Ditzik in view of Bellegarda fails to teach the system of claim 81, further comprising an activation circuit that is configured to sense when a user moves said stylus away from said user's mouth and toward said tablet in order to configure said tablet for editing

Shim teaches adjusting the speaker volume and/or the microphone gain to provide optimum audio signal levels for that situation. If the estimated sensor-head distance is greater than the reference distance, the system (1) adjusts the speaker volume and/or the microphone gain to its maximum signal level and/or (2) notifies the user that the maximum signal level may be inadequate to maintain acceptable audio communication and/or (3) disables the speaker and/or the microphone until the sensor-head distance is no greater than the reference distance or (4) takes no action. More than one proximity zone, each with its own reference distance and/or zone center, can be defined and sensed by the system. The minimum-to-maximum range for speaker volume and/or for microphone gain is adjustable for each user (Shim Col. 1 line 67 – Col. 2 line 22).

If the microphone is housed within the stylus, then various zones can be implemented to measure the distance a person is from a microphone (i.e. stylus with microphone housed in it), wherein if the stylus is at a certain distance from the user, then the handwriting recognition system will be expecting the user to begin writing, and the speech recognition system will not.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention stylus is equipped with a proximity sensor that is configured to sense a proximity of a human head to said microphone for the purposes of adjusting gain from a user, wherein ideal audio levels can be input into the processor for accurate speech recognition, wherein a minimum and maximum distance from the microphone can be implemented to establish thresholds that can identify when the stylus is at a certain distance from the user for the handwriting recognition system to begin expecting the user to begin writing.

6. **Claims 87 and 93-96 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ditzik US 6167376 A (hereinafter Ditzik) in view of Bellegarda et al. US 6285785 B1 (Bellegarda) and further in view of Black US 6307956 B1 (hereinafter Black).**

Re claim 87, Ditzik in view of Bellegarda fails to teach the system of claim 81, wherein said stylus is equipped with an identification circuit that is configured to identify an owner of said stylus

Black teaches a stylus 15 includes one or more sensors 20 that capture biometric properties of the user. The computer (chip) 40 processes the captured information to determine whether to enable access to an account/network/entry, or other entry or privilege once identification has been confirmed. In one preferred embodiment, the system includes means to enable the user to enter a primary identifier, the identifier being a series of letters, digits, a spoken word converted to text (speech recognition), or the like. The primary identifier is preferably the user's printed name, the user's birthday (and year), zip code, mother's maiden name, or PIN or password. (Black Col. 10 line 28-39 & Fig. 1)

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention stylus is equipped with an identification circuit that is configured to identify an owner of said stylus for the purposes of preventing an unknown user from accessing specific user-trained models/databases, wherein information specific to a user must be input prior to operation speech and/or handwriting operations.

Re claim 93, Ditzik teaches the system of claim 81, wherein a user message model is an instantiation for a particular user of said shared language model, said acoustic model, and said handwriting model (Col. 3 lines 49-64).

However, Ditzik fails to teach a shared language model

Bellegarda teaches a message recognition system 10 constructed and operated in accordance with a first embodiment of the invention. As employed herein a message is considered to be information generated by a human subject and entered into the

system 10, the information being entered through an acoustic signal, a handwritten stroke signal, or through a combination of acoustic and stroke signals. The information may represent individual characters, including numbers, letters of the alphabet, punctuation and the like. The information may also represent words, phrases, and paragraphs.

Additionally, Bellegarda teaches a feature vector that is a combination of FV.sub.S and FV.sub.H. The speech and handwriting feature vectors are each generated in response to simultaneously provided acoustic and handwriting input. In that the sampling rates and durations of the input are different for the speech and handwriting channels a normalization block 52 normalizes the two inputs to a common time base and combines the normalized feature vectors into a single feature vector. This combination may be a synthetic concatenation of the four dimensional handwriting vector with the 20 dimensional speech vector, as indicated in FIG. 4e, to provide a 24 dimensional combined vector (FV.sub.S,H). (Bellegarda Col. 10 line 57 – Col. 11 line 7).

However, Ditzik in view of Bellegarda fails to teach a user message model is an instantiation for a particular user

Black teaches a stylus 15 includes one or more sensors 20 that capture biometric properties of the user. The computer (chip) 40 processes the captured information to determine whether to enable access to an account/network/entry, or other entry or privilege once identification has been confirmed. In one preferred embodiment, the system includes means to enable the user to enter a primary identifier, the identifier being a series of letters, digits, a spoken word converted to text (speech recognition), or

the like. The primary identifier is preferably the user's printed name, the user's birthday (and year), zip code, mother's maiden name, or PIN or password. (Black Col. 10 line 28-39 & Fig. 1)

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention a user message model is an instantiation for a particular user of said shared language model, said acoustic model, and said handwriting model for the purposes of hand writing and speech complementing one another, wherein difficult pronunciations or spelling error may occur (i.e. a user can override writing a long word by just uttering the word itself). Additionally, it would have been obvious to one of ordinary skill in the art at the time of the invention a user message model is an instantiation for a particular user for the purposes of preventing an unknown user from accessing specific user-trained models/databases, wherein information specific to a user must be input prior to operation speech and/or handwriting operations.

Re claim 94, Ditzik teaches the system of claim 93, wherein said user message model is local to said system (Col. 3 line 65 – Col. 4 line 17).

Re claim 95, Ditzik teaches the system of claim 94, wherein said user message model is implemented in a virtual machine (Col. 6 lines 32-58).

Re claim 96, Ditzik teaches the system of claim 93, wherein said user message model is remotely stored in a database (Col. 3 line 65 – Col. 4 line 17)

7. **Claims 90 and 91 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ditzik US 6167376 A (hereinafter Ditzik) in view of Bellegarda et al. US 6285785 B1 (Bellegarda) and further in view of Bellegarda; Jerome R. US 5839106 A (hereinafter Bellegarda(2)).**

Re claim 90, Ditzik fails to teach the system of claim 81, further comprising a unified message model that includes said acoustic model, said handwriting model, and said shared language model, wherein said shared language model (Bellegarda Col. 5 lines 15-25 & Fig. 2 items 24 and 54) includes a syntactic model and a semantic model

Bellegarda teaches a message recognition system 10 constructed and operated in accordance with a first embodiment of the invention. As employed herein a message is considered to be information generated by a human subject and entered into the system 10, the information being entered through an acoustic signal, a handwritten stroke signal, or through a combination of acoustic and stroke signals. The information may represent individual characters, including numbers, letters of the alphabet, punctuation and the like. The information may also represent words, phrases, and paragraphs.

Additionally, Bellegarda teaches a feature vector that is a combination of FV.sub.S and FV.sub.H. The speech and handwriting feature vectors are each generated in response to simultaneously provided acoustic and handwriting input. In that the sampling rates and durations of the input are different for the speech and handwriting channels a normalization block 52 normalizes the two inputs to a common

time base and combines the normalized feature vectors into a single feature vector. This combination may be a synthetic concatenation of the four dimensional handwriting vector with the 20 dimensional speech vector, as indicated in FIG. 4e, to provide a 24 dimensional combined vector (FV.sub.S,H). (Bellegarda Col. 10 line 57 – Col. 11 line 7).

However, Ditzik in view of Bellegarda fails to teach a syntactic model and a semantic model

Bellegarda(2) teaches a hybrid recognition processor 220 might use an n-gram syntactic-type first model 310 to produce a list of candidate text messages from a sequence of feature vectors, and then employ a latent semantic-type second model 320 to rescore the list so that the most likely candidate, or hypothesis, is moved to the top of the list as necessary (Bellegarda(2) Col. 6 lines 51-67). Of course, such a sequential approach to integration will fail if the correct hypothesis is not included in the original list of candidates produced during the first recognition pass. Such failure may be prevented, however, by producing a relatively long list of candidates during the first pass, so that the original list is virtually guaranteed to include the correct hypothesis.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention a unified message model that includes said acoustic model, said handwriting model, and said shared language model, wherein said shared language model includes a syntactic model and a semantic model for the purposes of hand writing and speech complementing one another, wherein difficult pronunciations or spelling error may occur (i.e. a user can override writing a long word by just uttering the word itself). Additionally, it would have been obvious to one of ordinary skill in the art at

the time of the invention a semantic and syntactic model for the purposes of further correcting a ranked list of potential candidates by analyzing the context and grammar rules for a language to receive speech or handwriting, wherein the best candidate can be selected to be generated as text while conserving memory resources.

Re claim 91, Ditzik in view of Bellegarda fails to teach the system of claim 90, wherein said semantic model comprises at least one of:

(a) a semantic cluster of a first type that is a mathematically derived group of vectors representing text segments (Bellegarda(2) Col. 6 lines 51-67);

(b) a semantic cluster of a second type that is a discrete grouping of text that has a particular context; and

(c) a semantic cluster of a third type that is defined with respect to an individual reference word that is considered to be indicative of a particular context.

Bellegarda(2) teaches a hybrid recognition processor 220 might use an n-gram syntactic-type first model 310 to produce a list of candidate text messages from a sequence of feature vectors, and then employ a latent semantic-type second model 320 to rescore the list so that the most likely candidate, or hypothesis, is moved to the top of the list as necessary (Bellegarda(2) Col. 6 lines 51-67). Of course, such a sequential approach to integration will fail if the correct hypothesis is not included in the original list of candidates produced during the first recognition pass. Such failure may be prevented, however, by producing a relatively long list of candidates during the first pass, so that the original list is virtually guaranteed to include the correct hypothesis.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention a semantic cluster of a first type that is a mathematically derived group of vectors representing text segments for the purposes of further correcting a ranked list of potential candidates by analyzing the context and grammar rules for a language to receive speech or handwriting, wherein the best candidate can be selected to be generated as text while conserving memory resources.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael C. Colucci whose telephone number is (571)-

270-1847. The examiner can normally be reached on 9:30 am - 6:00 pm, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571)-272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael C Colucci/
Examiner, Art Unit 2626
Patent Examiner
AU 2626
(571)-270-1847
Michael.Colucci@uspto.gov
/Richemond Dorvil/
Supervisory Patent Examiner, Art Unit 2626

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11088032	SUOMINEN, EDWIN A.
	Examiner	Art Unit
	Colucci, Michael C	2626

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/05/2007	06/04/2008	11/07/2008						
	81	✓	✓	✓						
	82	✓	✓	✓						
	83	✓	✓	✓						
	84	✓	✓	-						
	85	✓	✓	✓						
	86		✓	✓						
	87		✓	✓						
	88		✓	✓						
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	97		✓	✓						
	98		✓	✓						
	99		✓	✓						
	100		✓	✓						
	101			✓						
	102			✓						

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11088032	SUOMINEN, EDWIN A.
	Examiner	Art Unit
	Colucci, Michael C	2626

SEARCHED			
Class	Subclass	Date	Examiner
382	187	11/5/2007	MC
704	256, 270	11/5/2007	MC
704	235, 257	6/4/2008	MC
379	56.1	6/4/2008	MC
382	124, 187	6/4/2008	MC
455	550.1	6/4/2008	MC
		6/4/2008	MC

SEARCH NOTES		
Search Notes	Date	Examiner
Searched 382/187 with keyword limitations	11/5/2007	MC
Searched 704/256 with keyword limitations	11/5/2007	MC
Searched 704/270 with keyword limitations	11/5/2007	MC
Consulted SPE Richemond Dorvil	11/5/2007	MC
Searched 704/235 with keyword limitations	6/4/2008	MC
Searched 704/257 with keyword limitations	6/4/2008	MC
Searched 379/56.1 with keyword limitations	6/4/2008	MC
Searched 382/124 with keyword limitations	6/4/2008	MC
Searched 455/550.1 with keyword limitations	6/4/2008	MC
Searched 382/187 with keyword limitations	6/4/2008	MC
Performed a double patenting search	5/27/2008	MC
Performed an inventors search	5/27/2008	MC
Consulted SPE Richemond Dorvil	5/27/2008	MC
Consulted Primary Examiner Talivaldis Smits	5/27/2008	MC
Checked the spec. for "medium" - not a signal	11/7/2008	MC

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

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BIB DATA SHEET

CONFIRMATION NO. 6401

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
11/088,032	03/22/2005 RULE	704	2626	**OR-0005

APPLICANTS
Edwin A. Suominen, Valley, WA;

**** CONTINUING DATA ***************************
This application is a CON of 10/061,052 01/28/2002 PAT 6,904,405
which is a CON of 09/616,157 07/14/2000 ABN
which claims benefit of 60/144,481 07/17/1999

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****
04/25/2005

Foreign Priority claimed	35 USC 119(a-d) conditions met	Verified and Acknowledged	Met after Allowance	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
☐ Yes ☑ No	☐ Yes ☑ No	/MICHAEL C COLUCCI/ Examiner's Signature	☐ Initials	WA	17	5	1

ADDRESS

WOODCOCK WASHBURN LLP
CIRA CENTRE, 12TH FLOOR
2929 ARCH STREET
PHILADELPHIA, PA 19104-2891
UNITED STATES

TITLE

Message recognition using shared language model

FILING FEE RECEIVED	FEES: Authority has been given in Paper
970	No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:

- ☐ All Fees
- ☐ 1.16 Fees (Filing)
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- ☐ 1.18 Fees (Issue)
- ☐ Other _____
- ☐ Credit

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: **Edwin A. Suominen**	Confirmation No.: **6401**
Application No.: **11/088,032**	Group Art Unit: **2626**
Filing Date: **March 22, 2005**	Examiner: **Michael C. Colucci**

For: **Message Recognition Using Shared Language Model**

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

Sir:

REPLY PURSUANT TO 37 CFR § 1.111

In response to the Official Action dated **June 9, 2008**, reconsideration is respectfully requested in view of the amendments and/or remarks as indicated below:

☐ **Amendments to the Specification** begin on page of this paper.

☒ **Amendments to the Claims** are reflected in the listing of the claims which begins on page 2 of this paper.

☐ **Amendments to the Drawings** begin on page of this paper and include an attached replacement sheet.

☒ **Remarks** begin on page 7 of this paper.

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

Listing of Claims:

Claims 1-80 (canceled)

Claim 81 (Currently Amended) A system for generating text responsive to both voice and handwriting input, comprising:

(a) a microphone;

(b) a stylus;

(c) a tablet including (1) a tablet surface, (2) a flat-panel display integrated into the tablet surface and responsive to freehand input conveyed via manipulation of the stylus on or near the tablet surface to render ink-like indicia of the freehand input, and (3) a message recognizer including a speech recognizer and a handwriting recognizer;

(d) wherein the speech recognizer is responsive to voice input conveyed via the microphone to provide text data in accordance with both a shared language model and an acoustic model; [[and]]

(e) wherein the accuracy of the shared language model is increased from received user input indicative of a correction, the input obtained from a speech recognizer or a handwriting recognizer; and

(f) the handwriting recognizer is responsive to freehand input conveyed via the stylus to provide text data in accordance with both the shared language model and a handwriting model.

Claim 82 (previously presented) The system of claim 81 wherein the microphone is mounted substantially beyond an immediate vicinity of the head of an individual.

Claim 83 (previously presented) The system of claim 82 wherein the microphone is housed in the stylus.

Claim 84 (Cancelled)

Claim 85 (previously presented) The system of claim 81 wherein:

(a) the speech recognizer provides text data without being

responsive to freehand input supplied to the handwriting recognizer; and

(b) the handwriting recognizer provides text data without being responsive to voice input supplied to the speech recognizer.

Claim 86 (previously presented) The system of claim 81, wherein said stylus is equipped with a proximity sensor that is configured to sense a proximity of a human head to said microphone.

Claim 87 (previously presented) The system of claim 81, wherein said stylus is equipped with an identification circuit that is configured to identify an owner of said stylus.

Claim 88 (previously presented) The system of claim 81, wherein at least one of said speech recognizer and said handwriting recognizer is configured to be responsive to an identifying signal to select a particular user message model to use when generating text responsive to said voice input.

Claim 89 (previously presented) The system of claim 88, wherein said particular user message model is remotely available over a wide area network.

Claim 90 (previously presented) The system of claim 81, further comprising a unified message model that includes said acoustic model, said handwriting model, and said shared language model, wherein said shared language model includes a syntactic model and a semantic model.

Claim 91 (previously presented) The system of claim 90, wherein said semantic model comprises at least one of:

(a) a semantic cluster of a first type that is a mathematically derived group of vectors representing text segments;

(b) a semantic cluster of a second type that is a discrete grouping of text that has a particular context; and

(c) a semantic cluster of a third type that is defined with respect to an individual reference word that is considered to be indicative of a particular context.

Claim 92 (previously presented) The system of claim 81, further comprising an activation circuit that is configured to sense when a user moves said stylus away from said user's mouth and toward said tablet in order to configure said tablet for editing.

Claim 93 (previously presented) The system of claim 81, wherein a user message model is an instantiation for a particular user of said shared language model, said acoustic model, and said handwriting model.

Claim 94 (previously presented) The system of claim 93, wherein said user message model is local to said system.

Claim 95 (previously presented) The system of claim 94, wherein said user message model is implemented in a virtual machine.

Claim 96 (previously presented) The system of claim 93, wherein said user message model is remotely stored in a database.

Claim 97 (Currently Amended) A method for generating text responsive to both voice and handwriting input, comprising:

activating a speech recognizer and a handwriting recognizer;

processing with said speech recognizer voice input conveyed via a microphone to provide a first text data in accordance with both a shared language model and an acoustic model;

processing with said handwriting recognizer hand input conveyed via a stylus to provide a second text data in accordance with both the shared language model and a handwriting model; and

generating a third text data based on a combination of said speech recognizer processing and said handwriting recognizer processing; and

improving the accuracy of said handwriting recognizer by training the handwriting recognizer in response to user correction by the speech recognizer.

Claim 98 (previously presented) The method according to claim 97, further comprising switching modes from processing input with said speech recognizer to processing input with said handwriting recognizer when said stylus moves away from a user's mouth and towards a tablet.

Claim 99 (Currently Amended) A method for receiving and processing a plurality of different types of input and converting said inputs into text data, comprising:

receiving voice input, wherein said voice input is conveyed via a stylus mounted microphone;

receiving writing input, wherein said writing input is conveyed via a tablet surface;

responding to said voice input with a speech recognizer, wherein said speech recognizer is configured to provide text data in accordance with both a shared language model and an acoustic model;

responding to said writing input with a writing recognizer, wherein said writing recognizer is configured to provide text data in accordance with both the shared language model and a writing model; [[and]]

improving the accuracy of the writing recognizer by training the shared language model by resolving text input from said speech recognizer in accordance with text input from said writing recognizer; and

improving the accuracy of the speech recognizer by training the shared language model by resolving text input from said writing recognizer in accordance with text input from said speech recognizer.

Claim 100 (previously presented) The method according to claim 99, further comprising accessing at least one of said shared language model, said acoustic model and said writing model via a network.

Claim 101 (New) A computer readable storage medium, comprising instructions that when executed on a processor perform the steps of:

receiving voice input;

receiving writing input;

responding to said voice input with a speech recognizer, wherein said speech recognizer is configured to provide text data in accordance with both a shared language model and an acoustic model;

responding to said writing input with a writing recognizer, wherein said writing recognizer is configured to provide text data in accordance with both the shared language model and a writing model;

increasing the accuracy of the writing recognizer by training the shared language model by resolving text input from said speech recognizer in accordance with text input from said writing recognizer; and

increasing the accuracy of the speech recognizer by training the shared language model by resolving text input from said writing recognizer in accordance with text input from said speech recognizer.

Claim 102 (New) An apparatus for generating text responsive to both voice and handwriting input, comprising:

means for receiving voice input;

means for receiving writing input;

means for responding to said voice input with a speech recognizer, wherein said speech recognizer is configured to provide text data in accordance with both a shared language model and an acoustic model;

means for responding to said writing input with a writing recognizer, wherein said writing recognizer is configured to provide text data in accordance with both the shared language model and a writing model;

means for improving the accuracy of the writing recognizer by training the shared language model by resolving text input from said speech recognizer in accordance with text input from said writing recognizer; and

means for improving the accuracy of the speech recognizer by training the shared language model by resolving text input from said writing recognizer in accordance with text input from said speech recognizer.

REMARKS

Claims 81-102 are pending in the present application. Claims 81, 97, 99, 101 and 102 are the independent claims. Claims 81-100 stand rejected. Claim 84 is cancelled in the present reply. Claims 101 and 102 are new.

Telephonic Interview

On August 28, 2008, examiner Michael Colucci and the undersigned conducted a telephonic interview. Any substantive subject matter discussed during said interview is incorporated into the remarks, below.

The applicant would like to thank the examiner for granting the interview, and should the examiner have any questions and/or concerns, the undersigned can be readily reached at 206-903-2467.

Claim Rejections – Nonstatutory Double Patenting

Claims 81, 97 and 99 stand rejected for nonstatutory obviousness-type double patenting as being unpatenable over claim 62 of Pat. No. 10/061,052. Applicant respectfully submits that the present claim amendments overcome the rejections.

Claim Rejections – 35 USC § 103

Claims 81, 82, 84, 88, 89, 97, 99, and 100 are rejected under 35 USC 103(a) as being unpatentable over Ditzik (Pat. No. 6,167,376) in view of Bellegarda et al. (Pat. No. 6,285,785; hereinafter "Bellegarda").

Applicant has amended independent claim 81 to incorporate portions of the limitations found in claim 84, as well as other limitations, and have cancelled claim 84. As such, while the present amendments are not identical to the limitations of claim 84, applicant feels that a discussion of that rejection will help clarify the present application. The examiner states that the limitation previously found in claim 84 of "the shared language model is trainable responsive to user correction of misrecognition by either the speech recognizer or the handwriting recognizer, thereby improving accuracy of both" is taught by Ditzik at col. 7, lines 19-64.

Applicant respectfully disagrees. Bellegarda purports to disclose two embodiments. The first, illustrated in the reference's FIG. 1, shows separate language models 38a, 36a, one for speech and the other for handwriting recognition. The reference states that "the same language model could also be used for AHR [as for ASR]," col. 7, lines 66-67, and "the LM for speech may be different than the LM for handwriting," col. 8, lines 31-32. The second embodiment shown in connection with FIG. 2 depicts a single language model, but operates with a feature vector that is stated to be a combination of "speech and handwriting feature vectors [that] are each generated in response to simultaneously provided acoustic and handwriting input," col. 10, lines 57-60. Applicant does not believe that Bellegarda teaches or suggests any combination of its two embodiments.

Bellagarda further discloses that handwriting training is to be used to improve only the handwriting model and that speech training is to be used to improve only the speech model: "During training of the system 10 the feature vectors are each applied to an associated word model training processor. Specifically, the handwriting feature vectors are applied to a handwriting model trainer (MT_H) processor 28 and the speech vectors are applied to a speech model trainer (MT_S) processor 30." Col. 7, lines 6-11. Bellagarda neither discloses applying the handwriting feature vectors to a speech model trainer processor, nor applying the speech vectors to a handwriting model trainer processor.

In comparison, applicant's claim 81 calls for the accuracy of the shared language model to be improved. Accuracy improvement performed responsive to received user correction of misrecognition by either of the first and second types of message recognition advantageously can improve accuracy of each. Applicant believes that Bellagarda fails to teach or suggest any improvement of the accuracy of a shared language model, and that independent claim 81 is therefore in condition for allowance.

Furthermore, in the telephonic interview of August 28, 2008, the examiner stated that the claimed limitation of "the shared language model is trainable responsive to user correction of misrecognition by either the speech recognizer or the handwriting recognizer, thereby improving accuracy of both" is taught by Ditzik in both the abstract ("The computer system can recognize…speech, converting this to information to computer recognizable text, which may be displayed onto a display device…Speech recognition errors may be corrected via a pen input device."), and col. 7, lines 19-64:

Applicants respectfully disagree. Ditzik appears to disclose correcting errors after they occur using text input, but not *improving the accuracy* of a shared language model to avoid errors in the shared language model the future by correcting errors after they occur, and also not *improving the accuracy* of each of a speech recognizer and a handwriting recognizer by training a shared language model.

The other independent claims, namely, claims 97 and 99, as amended, also recite similar limitations. Insofar as the dependent claims incorporate the limitations of the independent claims, they define over the art for similar reasons.

CONCLUSION

Applicant believes that the present remarks are responsive to each of the points raised by the examiner in the official action, and submits that claims 81-100 of the application are in condition for allowance. Favorable consideration and passage to issue of the application at the examiner's earliest convenience is earnestly solicited.

Date: September 9, 2008

/Peter Trahms-Neudorfer/
Peter Trahms-Neudorfer
Registration No. 59,282

Woodcock Washburn LLP
Cira Centre
2929 Arch Street, 12th Floor
Philadelphia, PA 19104-2891
Telephone: (215) 568-3100
Facsimile: (215) 568-3439

Electronic Acknowledgement Receipt	
EFS ID:	3914230
Application Number:	11088032
International Application Number:	
Confirmation Number:	6401
Title of Invention:	Message recognition using shared language model
First Named Inventor/Applicant Name:	Edwin A. Suominen
Customer Number:	23377
Filer:	Peter Trahms-Neudorfer/Selina Gillespie
Filer Authorized By:	Peter Trahms-Neudorfer
Attorney Docket Number:	**OR-0005
Receipt Date:	09-SEP-2008
Filing Date:	22-MAR-2005
Time Stamp:	18:07:29
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	asfiledtransmittal.pdf	48692 d173d4b67188ee029fcdff480fbb580fa4d27edc	no	1
Warnings:					
Information:					

2		asfiledamendment.pdf	129610 5a08a5199aa46e0cf10864a2d780bd99515 73981	yes	9

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	6
	Applicant Arguments/Remarks Made in an Amendment	7	9

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PTO/SB/21 (01-08)
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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission	10

Application Number	11/088,032
Filing Date	March 22, 2005
First Named Inventor	Edwin A. Suominen
Art Unit	2626
Examiner Name	Michael C. Colucci
Attorney Docket Number	**OR-0005

ENCLOSURES (*Check all that apply*)

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☑ Amendment/Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
  - ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
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- ☐ CD, Number of CD(s) _____
  - ☐ Landscape Table on CD
- ☐ After Allowance Communication to TC
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- ☐ Proprietary Information
- ☐ Status Letter
- ☐ Other Enclosure(s) (please Identify below):

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Woodcock Washburn LLP		
Signature	/ Peter Trahms-Neudorfer/		
Printed name	Peter Trahms-Neudorfer		
Date	September 9, 2008	Reg. No.	59,282

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
11/088,032	03/22/2005	

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☐		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	09/09/2008	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 21	Minus	** 20	= 1	X $ =		OR	X $50=	50
	Independent (37 CFR 1.16(h))	* 5	Minus	***3	= 2	X $ =		OR	X $210=	420
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	470

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L 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.

Legal Instrument Examiner:
/JOY DOBBS/

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/088,032	03/22/2005	Edwin A. Suominen	**OR-0005	6401

23377 7590 09/04/2008

WOODCOCK WASHBURN LLP
CIRA CENTRE, 12TH FLOOR
2929 ARCH STREET
PHILADELPHIA, PA 19104-2891

EXAMINER	
COLUCCI, MICHAEL C	
ART UNIT	**PAPER NUMBER**
2626	

MAIL DATE	DELIVERY MODE
09/04/2008	PAPER

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

The time period for reply, if any, is set in the attached communication.

Interview Summary	Application No.	Applicant(s)	
	11/088,032	SUOMINEN, EDWIN A.	
	Examiner	Art Unit	
	MICHAEL C. COLUCCI	2626	

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

(1) *MICHAEL C. COLUCCI*. (3)_____.

(2) *PETER TRAHMS-NEUDORFER (59282)*. (4)_____.

Date of Interview: *28 August 2008*.

Type: a)☒ Telephonic b)☐ Video Conference
c)☐ Personal [copy given to: 1)☐ applicant 2)☐ applicant's representative]

Exhibit shown or demonstration conducted: d)☐ Yes e)☒ No.
If Yes, brief description: _____.

Claim(s) discussed: *81-100*.

Identification of prior art discussed: *US 6167376 A (Ditzik), US 5839106 A (Bellegarda)*.

Agreement with respect to the claims f)☒ was reached. g)☐ was not reached. h)☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: *The focus of the interview was directed toward the use of voice recognition to correct hand writing and whether or not Ditzik or Bellegarda teaches this limitation. However, the proposed amendments to do not appear to overcome the prior art of record. Further, applicant has agreed to amend the claims to further illustrate correcting hand writing by the use of speech recognition. Furthermore, a new search will be conducted upon receiving a properly filed and amended set of claims.*.

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

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN A NON-EXTENDABLE PERIOD OF THE LONGER OF ONE MONTH OR THIRTY DAYS FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

/Michael C Colucci/ Examiner, Art Unit 2626	08/28/2008

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

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

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

———

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

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

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

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

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

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DOCKET NO.: **OR-0005 **PATENT**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:
Edwin A. Suominen

Confirmation No.: 6401

Application No.: 11/088,032 **Group Art Unit: 2626**

Filing Date: March 22, 2005 **Examiner: Michael C. Colucci**

For: MESSAGE RECOGNITION USING SHARED LANGUAGE MODEL

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

NOTIFICATION OF LOSS OF ENTITLEMENT TO SMALL ENTITY STATUS
(37 CFR 1.28(b))

Applicant hereby notifies the Patent and Trademark Office that it is no longer entitled to status as a Small Entity, and that the claim for Small Entity status is hereby withdrawn.

Date: 8/5/2008

Michael D. Stein
Registration No. 34,734

Woodcock Washburn LLP
Cira Centre
2929 Arch Street, 12th Floor
Philadelphia, PA 19104-2891
Telephone: (215) 568-3100
Facsimile: (215) 568-3439

Electronic Acknowledgement Receipt	
EFS ID:	3787452
Application Number:	11088032
International Application Number:	
Confirmation Number:	6401
Title of Invention:	Message recognition using shared language model
First Named Inventor/Applicant Name:	Edwin A. Suominen
Customer Number:	23377
Filer:	Michael David Stein/Gina Massimino
Filer Authorized By:	Michael David Stein
Attorney Docket Number:	**OR-0005
Receipt Date:	15-AUG-2008
Filing Date:	22-MAR-2005
Time Stamp:	12:39:56
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	or5.pdf	16103 f9f2e6005c7f9bbc45b149d0cf608655cf4525cf	no	1
Warnings:					
Information:					

Total Files Size (in bytes):	16103

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/088,032	03/22/2005	Edwin A. Suominen	**OR-0005	6401

23377 7590 06/09/2008
WOODCOCK WASHBURN LLP
CIRA CENTRE, 12TH FLOOR
2929 ARCH STREET
PHILADELPHIA, PA 19104-2891

EXAMINER	
COLUCCI, MICHAEL C	
ART UNIT	**PAPER NUMBER**
2626	

MAIL DATE	DELIVERY MODE
06/09/2008	PAPER

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

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	11/088,032	SUOMINEN, EDWIN A.	
	Examiner	Art Unit	
	MICHAEL C. COLUCCI	2626	

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

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

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

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

Disposition of Claims

4)☒ Claim(s) *81-100* is/are pending in the application.

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

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *81-100* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

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

Application Papers

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

10)☒ The drawing(s) filed on *22 March 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

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

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

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

Priority under 35 U.S.C. § 119

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

a)☐ All b)☐ Some * c)☐ None of:

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

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

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

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

Attachment(s)

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

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see Remarks pages 6-7, filed 03/17/2008, with respect to the rejection(s) of claim(s) 81 under *35 U.S.C. 103* have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Ditzik US 6167376 A (hereinafter Ditzik) in view of Bellegarda et al. US 6285785 B1 (Bellegarda).

Argument 1 (pages 6-7 *Claim Rejections - 35 U.S.C. 103*):

- "wherein the speech recognizer is responsive to voice input conveyed via the microphone to provide text data in accordance with both a shared language model and an acoustic model; and
- (e) the handwriting recognizer is responsive to freehand input conveyed via the stylus to provide text data in accordance with both the shared language model and a handwriting model"

"Cited art cannot be used to reject the recited elements in claim 1: an (1) "an acoustic model," (2) "a handwriting model" and (3) "a shared language model" for both (1) and (2). Simply put, the notion of a shared language model to both an acoustic model and a handwriting model is not disclosed by the cited art. See claim 1"

Response to argument 1 :

Examiner takes the position that the speech recognizer responsive to voice input conveyed via the microphone to provide text data in accordance with both a

shared language model and an acoustic model is *not taught* within cited prior art. Similarly, Examiner takes the position that the handwriting recognizer responsive to freehand input conveyed via the stylus to provide text data in accordance with both the shared language model and a handwriting model is not taught within cited prior art. The closest prior art found, Arai et al US 5841901 A (hereinafter Arai) described a device used to read in handwritten characters by use of a stylus. Additionally, Arai teaches pattern recognition being in the form of speech recognition (i.e. the use of a microphone) and/or handwritten character recognition, however, the scope of the Arai invention deals with handwritten character recognition. Arai teaches the use of a pattern dictionary to compare the handwritten results from input, but does not teach an acoustic or language model. The secondary reference introduced, Austin et al US 5737490 A (hereinafter Austin) focuses on the use of speech recognition using an acoustic model such as a Markov model. The combined teaching of Arai and Austin can be used to implement a method of both speech and handwritten input on a stylus, however the use of both a shared language model and an acoustic model for a first input as well as both the shared language model and a handwriting model as a second input is not taught.

Additionally, related patent serial number 10061052 discloses allowable subject matter from a more general perspective than the present invention, relevant to a first and second message input, wherein a shared language model is taught.

Further, patent serial number 10061052 discloses a first message recognizer, responsive to the first type of message input to provide text data in accordance with both the shared language model and the first model; and (c) a second message recognizer, responsive to the second type of message input to provide text data in accordance with both the shared language model and the second model.

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 81, 97, and 99 rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 62 of U.S. Patent Serial No. 10061052. Although the conflicting claims are not identical, they are not patentably distinct from each other because it would have been obvious to use a first message

recognizer as a handwriting recognizer and similarly, a second message recognizer as a speech recognizer and similarly. Further it would have been obvious to use a first model as an acoustic model and similarly, a second model as a handwriting model. Claim 81 of Patent Serial No. 10061052 discloses the limitations the first type of message recognition is speech recognition, the first type of message input is voice input, and the first model is an acoustic model; and the second type of message recognition is handwriting recognition, the second type of message input is freehand input, and the second model is a handwriting model.

Claim Rejections - 35 USC § 103

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

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 81, 82, 84, 85, 88, 89, 97, 99, and 100 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ditzik US 6167376 A (hereinafter Ditzik) in view of Bellegarda et al. US 6285785 B1 (Bellegarda).

Re claims 81, 97, and 99, Ditzik teaches a system for generating text responsive to both voice and handwriting input, comprising:

(a) a microphone (Col. 2 line 65 – Col. 3 line 18);

(b) a stylus (Fig. 2 item 10); [[and]]

(c) a tablet including (1) a tablet surface, (2) a flat-panel display integrated into the tablet surface and responsive to freehand input conveyed via manipulation of the stylus on or near the tablet surface to render ink-like indicia of the freehand input, and (3) a message recognizer including a speech recognizer and a handwriting recognizer (Col. 4 line 49 – Col. 5 line 2 & Fig. 2);

(d) wherein the speech recognizer is responsive to voice input conveyed via the microphone to provide text data in accordance with both a shared language model and an acoustic model (Col. 3 lines 49-64);

(e) the handwriting recognizer is responsive to freehand input conveyed via the stylus to provide text data in accordance with both the shared language model and a handwriting model (Col. 5 lines 38-67)

However, Ditzik fails to teach a shared language model and an acoustic model (Bellegarda Col. 5 lines 15-25 & Fig. 2 items 26 and 54)

shared language model and a handwriting model (Bellegarda Col. 5 lines 15-25 & Fig. 2 items 24 and 54)

Bellegarda teaches a message recognition system 10 constructed and operated in accordance with a first embodiment of the invention. As employed herein a message is considered to be information generated by a human subject and entered into the system 10, the information being entered through an acoustic signal, a handwritten stroke signal, or through a combination of acoustic and stroke signals. The information may represent individual characters, including numbers, letters of the alphabet,

punctuation and the like. The information may also represent words, phrases, and paragraphs.

Additionally, Bellegarda teaches a feature vector that is a combination of FV.sub.S and FV.sub.H. The speech and handwriting feature vectors are each generated in response to simultaneously provided acoustic and handwriting input. In that the sampling rates and durations of the input are different for the speech and handwriting channels a normalization block 52 normalizes the two inputs to a common time base and combines the normalized feature vectors into a single feature vector. This combination may be a synthetic concatenation of the four dimensional handwriting vector with the 20 dimensional speech vector, as indicated in FIG. 4e, to provide a 24 dimensional combined vector (FV.sub.S,H). (Bellegarda Col. 10 line 57 – Col. 11 line 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention a speech and handwriting recognizer using a shared language model, an acoustic model, and a handwriting model for the purposes of hand writing and speech complementing one another, wherein difficult pronunciations or spelling error may occur (i.e. a user can override writing a long word by just uttering the word itself).

Re claim 82, Ditzik teaches the system of claim 81 wherein the microphone is head mounted substantially beyond an immediate vicinity of the head of an individual (Col. 3 line 65 – Col. 4 line 17).

Re claim 84, Ditzik teaches the system of claim [[1]] 8 1 wherein the shared language model is trainable responsive to user correction of misrecognition by either the speech recognizer or the handwriting recognizer, thereby improving accuracy of both (Col. 7 lines 19-64).

Re claim 85, Ditzik teaches the system of claim [[1]] 81 wherein:

(a) the speech recognizes recognizer provides text data without being responsive to freehand input supplied to the [[the]] handwriting recognizes recognizer (Fig. 1); and

(b) the handwriting recognizer provides text data without being responsive to voice input supplied to the [[the]] speech recognizer (Fig. 2)

Re claim 88, Ditzik teaches the system of claim 81, wherein at least one of said speech recognizer and said handwriting recognizer (Col. 5 lines 38-67, *pattern databases for stylus strokes*) is configured to be responsive to an identifying signal to select a particular user message model to use when generating text responsive to said voice input (Col. 3 lines 49-64 *phoneme models for speech input*).

Re claim 89, Ditzik teaches the system of claim 88, wherein said particular user message model is remotely available over a wide area network (Col. 8 lines 15-29).

Re claim 100, Ditzik teaches the method according to claim 99, further comprising accessing at least one of said shared language model, said acoustic model and said writing model (Col. 4 line 49 – Col. 5 line 2 & Fig. 2) via a network (Col. 8 lines 15-29).

However, Ditzik fails to teach a shared language model

Bellegarda teaches a message recognition system 10 constructed and operated in accordance with a first embodiment of the invention. As employed herein a message is considered to be information generated by a human subject and entered into the system 10, the information being entered through an acoustic signal, a handwritten stroke signal, or through a combination of acoustic and stroke signals. The information may represent individual characters, including numbers, letters of the alphabet, punctuation and the like. The information may also represent words, phrases, and paragraphs.

Additionally, Bellegarda teaches a feature vector that is a combination of FV.sub.S and FV.sub.H. The speech and handwriting feature vectors are each generated in response to simultaneously provided acoustic and handwriting input. In that the sampling rates and durations of the input are different for the speech and handwriting channels a normalization block 52 normalizes the two inputs to a common time base and combines the normalized feature vectors into a single feature vector. This combination may be a synthetic concatenation of the four dimensional handwriting vector with the 20 dimensional speech vector, as indicated in FIG. 4e, to provide a 24 dimensional combined vector (FV.sub.S,H). (Bellegarda Col. 10 line 57 – Col. 11 line 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention accessing at least one of said shared language model, said acoustic model and said writing model via a network for the purposes of hand writing and speech complementing one another, wherein difficult pronunciations or spelling error may occur (i.e. a user can override writing a long word by just uttering the word itself).

5. Claim 83 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ditzik US 6167376 A (hereinafter Ditzik) in view of Bellegarda et al. US 6285785 B1 (Bellegarda) and further in view of Watterson et al US 4969180 A (hereinafter Watterson).

Re claim 83, Ditzik in view of Bellegarda fails to teach the system of claim 82 wherein the microphone is housed in the stylus

Watterson teaches a functional writing pen as a cordless handset incorporating a microphone and speaker unit, which can conveniently serve as both a pen and a telephone handset for normal telephone conversation (Watterson Col. 2 lines 11-20).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention a microphone housed in a stylus, wherein housing a microphone within a writing instrument such as a stylus or pen would allow for hands-free communication with a speech recognition system to provide a more convenient means for a user to input data through by handwriting and/or speech and not holding a microphone in addition to a stylus.

6. **Claims 86, 92, and 98 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ditzik US 6167376 A (hereinafter Ditzik) in view of Bellegarda et al. US 6285785 B1 (Bellegarda) and further in view of Shim et al. US 6853850 B2 (hereinafter Shim).**

Re claim 86, Ditzik in view of Bellegarda fails to teach the system of claim 81, wherein said stylus is equipped with a proximity sensor that is configured to sense a proximity of a human head to said microphone

Shim teaches adjusting the speaker volume and/or the microphone gain to provide optimum audio signal levels for that situation. If the estimated sensor-head distance is greater than the reference distance, the system (1) adjusts the speaker volume and/or the microphone gain to its maximum signal level and/or (2) notifies the user that the maximum signal level may be inadequate to maintain acceptable audio communication and/or (3) disables the speaker and/or the microphone until the sensor-head distance is no greater than the reference distance or (4) takes no action. More than one proximity zone, each with its own reference distance and/or zone center, can be defined and sensed by the system. The minimum-to-maximum range for speaker volume and/or for microphone gain is adjustable for each user (Shim Col. 1 line 67 – Col. 2 line 22).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention stylus is equipped with a proximity sensor that is configured to sense a proximity of a human head to said microphone for the purposes of adjusting

gain from a user, wherein ideal audio levels can be input into the processor for accurate speech recognition, wherein a minimum and maximum distance from the microphone can be implemented to establish thresholds.

Re claims 92 and 98, Ditzik in view of Bellegarda fails to teach the system of claim 81, further comprising an activation circuit that is configured to sense when a user moves said stylus away from said user's mouth and toward said tablet in order to configure said tablet for editing

Shim teaches adjusting the speaker volume and/or the microphone gain to provide optimum audio signal levels for that situation. If the estimated sensor-head distance is greater than the reference distance, the system (1) adjusts the speaker volume and/or the microphone gain to its maximum signal level and/or (2) notifies the user that the maximum signal level may be inadequate to maintain acceptable audio communication and/or (3) disables the speaker and/or the microphone until the sensor-head distance is no greater than the reference distance or (4) takes no action. More than one proximity zone, each with its own reference distance and/or zone center, can be defined and sensed by the system. The minimum-to-maximum range for speaker volume and/or for microphone gain is adjustable for each user (Shim Col. 1 line 67 – Col. 2 line 22).

If the microphone is housed within the stylus, then various zones can be implemented to measure the distance a person is from a microphone (i.e. stylus with microphone housed in it), wherein if the stylus is at a certain distance from the user,

then the handwriting recognition system will be expecting the user to begin writing, and the speech recognition system will not.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention stylus is equipped with a proximity sensor that is configured to sense a proximity of a human head to said microphone for the purposes of adjusting gain from a user, wherein ideal audio levels can be input into the processor for accurate speech recognition, wherein a minimum and maximum distance from the microphone can be implemented to establish thresholds that can identify when the stylus is at a certain distance from the user for the handwriting recognition system to begin expecting the user to begin writing.

7. **Claims 87 and 93-96 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ditzik US 6167376 A (hereinafter Ditzik) in view of Bellegarda et al. US 6285785 B1 (Bellegarda) and further in view of Black US 6307956 B1 (hereinafter Black).**

Re claim 87, Ditzik in view of Bellegarda fails to teach the system of claim 81, wherein said stylus is equipped with an identification circuit that is configured to identify an owner of said stylus

Black teaches a stylus 15 includes one or more sensors 20 that capture biometric properties of the user. The computer (chip) 40 processes the captured information to determine whether to enable access to an account/network/entry, or other entry or privilege once identification has been confirmed. In one preferred embodiment, the

system includes means to enable the user to enter a primary identifier, the identifier being a series of letters, digits, a spoken word converted to text (speech recognition), or the like. The primary identifier is preferably the user's printed name, the user's birthday (and year), zip code, mother's maiden name, or PIN or password. (Black Col. 10 line 28-39 & Fig. 1)

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention stylus is equipped with an identification circuit that is configured to identify an owner of said stylus for the purposes of preventing an unknown user from accessing specific user-trained models/databases, wherein information specific to a user must be input prior to operation speech and/or handwriting operations.

Re claim 93, Ditzik teaches the system of claim 81, wherein a user message model is an instantiation for a particular user of said shared language model, said acoustic model, and said handwriting model (Col. 3 lines 49-64).

However, Ditzik fails to teach a shared language model

Bellegarda teaches a message recognition system 10 constructed and operated in accordance with a first embodiment of the invention. As employed herein a message is considered to be information generated by a human subject and entered into the system 10, the information being entered through an acoustic signal, a handwritten stroke signal, or through a combination of acoustic and stroke signals. The information may represent individual characters, including numbers, letters of the alphabet,

punctuation and the like. The information may also represent words, phrases, and paragraphs.

Additionally, Bellegarda teaches a feature vector that is a combination of FV.sub.S and FV.sub.H. The speech and handwriting feature vectors are each generated in response to simultaneously provided acoustic and handwriting input. In that the sampling rates and durations of the input are different for the speech and handwriting channels a normalization block 52 normalizes the two inputs to a common time base and combines the normalized feature vectors into a single feature vector. This combination may be a synthetic concatenation of the four dimensional handwriting vector with the 20 dimensional speech vector, as indicated in FIG. 4e, to provide a 24 dimensional combined vector (FV.sub.S,H). (Bellegarda Col. 10 line 57 – Col. 11 line 7).

However, Ditzik in view of Bellegarda fails to teach a user message model is an instantiation for a particular user

Black teaches a stylus 15 includes one or more sensors 20 that capture biometric properties of the user. The computer (chip) 40 processes the captured information to determine whether to enable access to an account/network/entry, or other entry or privilege once identification has been confirmed. In one preferred embodiment, the system includes means to enable the user to enter a primary identifier, the identifier being a series of letters, digits, a spoken word converted to text (speech recognition), or the like. The primary identifier is preferably the user's printed name, the user's birthday (and year), zip code, mother's maiden name, or PIN or password. (Black Col. 10 line 28-39 & Fig. 1)

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention a user message model is an instantiation for a particular user of said shared language model, said acoustic model, and said handwriting model for the purposes of hand writing and speech complementing one another, wherein difficult pronunciations or spelling error may occur (i.e. a user can override writing a long word by just uttering the word itself). Additionally, it would have been obvious to one of ordinary skill in the art at the time of the invention a user message model is an instantiation for a particular user for the purposes of preventing an unknown user from accessing specific user-trained models/databases, wherein information specific to a user must be input prior to operation speech and/or handwriting operations.

Re claim 94, Ditzik teaches the system of claim 93, wherein said user message model is local to said system (Col. 3 line 65 – Col. 4 line 17).

Re claim 95, Ditzik teaches the system of claim 94, wherein said user message model is implemented in a virtual machine (Col. 6 lines 32-58).

Re claim 96, Ditzik teaches the system of claim 93, wherein said user message model is remotely stored in a database (Col. 3 line 65 – Col. 4 line 17)

8. **Claims 90 and 91 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ditzik US 6167376 A (hereinafter Ditzik) in view of Bellegarda et al. US**

6285785 B1 (Bellegarda) and further in view of Bellegarda; Jerome R. US 5839106 A (hereinafter Bellegarda(2)).

Re claim 90, Ditzik fails to teach the system of claim 81, further comprising a unified message model that includes said acoustic model, said handwriting model, and said shared language model, wherein said shared language model (Bellegarda Col. 5 lines 15-25 & Fig. 2 items 24 and 54) includes a syntactic model and a semantic model

Bellegarda teaches a message recognition system 10 constructed and operated in accordance with a first embodiment of the invention. As employed herein a message is considered to be information generated by a human subject and entered into the system 10, the information being entered through an acoustic signal, a handwritten stroke signal, or through a combination of acoustic and stroke signals. The information may represent individual characters, including numbers, letters of the alphabet, punctuation and the like. The information may also represent words, phrases, and paragraphs.

Additionally, Bellegarda teaches a feature vector that is a combination of FV.sub.S and FV.sub.H. The speech and handwriting feature vectors are each generated in response to simultaneously provided acoustic and handwriting input. In that the sampling rates and durations of the input are different for the speech and handwriting channels a normalization block 52 normalizes the two inputs to a common time base and combines the normalized feature vectors into a single feature vector. This combination may be a synthetic concatenation of the four dimensional handwriting

vector with the 20 dimensional speech vector, as indicated in FIG. 4e, to provide a 24 dimensional combined vector (FV.sub.S,H). (Bellegarda Col. 10 line 57 – Col. 11 line 7).

However, Ditzik in view of Bellegarda fails to teach a syntactic model and a semantic model

Bellegarda(2) teaches a hybrid recognition processor 220 might use an n-gram syntactic-type first model 310 to produce a list of candidate text messages from a sequence of feature vectors, and then employ a latent semantic-type second model 320 to rescore the list so that the most likely candidate, or hypothesis, is moved to the top of the list as necessary (Bellegarda(2) Col. 6 lines 51-67). Of course, such a sequential approach to integration will fail if the correct hypothesis is not included in the original list of candidates produced during the first recognition pass. Such failure may be prevented, however, by producing a relatively long list of candidates during the first pass, so that the original list is virtually guaranteed to include the correct hypothesis.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention a unified message model that includes said acoustic model, said handwriting model, and said shared language model, wherein said shared language model includes a syntactic model and a semantic model for the purposes of hand writing and speech complementing one another, wherein difficult pronunciations or spelling error may occur (i.e. a user can override writing a long word by just uttering the word itself). Additionally, it would have been obvious to one of ordinary skill in the art at the time of the invention a semantic and syntactic model for the purposes of further correcting a ranked list of potential candidates by analyzing the context and grammar

rules for a language to receive speech or handwriting, wherein the best candidate can be selected to be generated as text while conserving memory resources.

Re claim 91, Ditzik in view of Bellegarda fails to teach the system of claim 90, wherein said semantic model comprises at least one of:

(a) a semantic cluster of a first type that is a mathematically derived group of vectors representing text segments (Bellegarda(2) Col. 6 lines 51-67);

(b) a semantic cluster of a second type that is a discrete grouping of text that has a particular context; and

(c) a semantic cluster of a third type that is defined with respect to an individual reference word that is considered to be indicative of a particular context.

Bellegarda(2) teaches a hybrid recognition processor 220 might use an n-gram syntactic-type first model 310 to produce a list of candidate text messages from a sequence of feature vectors, and then employ a latent semantic-type second model 320 to rescore the list so that the most likely candidate, or hypothesis, is moved to the top of the list as necessary (Bellegarda(2) Col. 6 lines 51-67). Of course, such a sequential approach to integration will fail if the correct hypothesis is not included in the original list of candidates produced during the first recognition pass. Such failure may be prevented, however, by producing a relatively long list of candidates during the first pass, so that the original list is virtually guaranteed to include the correct hypothesis.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention a semantic cluster of a first type that is a mathematically derived

group of vectors representing text segments for the purposes of further correcting a ranked list of potential candidates by analyzing the context and grammar rules for a language to receive speech or handwriting, wherein the best candidate can be selected to be generated as text while conserving memory resources.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 5841901 A, US 5396443 A, US 6173259 B1, US 5313557 A, US 5737490 A, US 20020158599 A1.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael C. Colucci whose telephone number is (571)-270-1847. The examiner can normally be reached on 9:30 am - 6:00 pm, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571)-272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael C Colucci/
Examiner, Art Unit 2626
Patent Examiner
AU 2626
(571)-270-1847
Michael.Colucci@uspto.gov
/Richemond Dorvil/
Supervisory Patent Examiner, Art Unit 2626

Notice of References Cited	Application/Control No. 11/088,032	Applicant(s)/Patent Under Reexamination SUOMINEN, EDWIN A.	
	Examiner MICHAEL C. COLUCCI	Art Unit 2626	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-4,969,180 A	11-1990	Watterson et al.	379/56.1
*	B	US-5,313,557 A	05-1994	Osterhout, Ralph	704/272
*	C	US-5,396,443 A	03-1995	Mese et al.	713/321
*	D	US-5,737,490 A	04-1998	Austin et al.	704/256
*	E	US-5,839,106 A	11-1998	Bellegarda, Jerome R.	704/257
*	F	US-5,841,901 A	11-1998	Arai et al.	382/187
*	G	US-6,167,376 A	12-2000	Ditzik, Richard Joseph	704/235
*	H	US-6,173,259 B1	01-2001	Bijl et al.	704/235
*	I	US-6,285,785 B1	09-2001	Bellegarda et al.	382/187
*	J	US-6,307,956 B1	10-2001	Black, Gerald R.	382/124
*	K	US-2002/0158599 A1	10-2002	Fujita et al.	318/568.11
*	L	US-6,853,850 B2	02-2005	Shim et al.	455/550.1
	M	US-			

FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

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

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

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S46	686	((proximit$5 or distance) near3 sens$4) with microphone	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 13:58
S47	5	S46 and ((identif $6 or identity) with (stylus))	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 14:01
S48	156	S46 and ((identif $6 or identity) with (user or owner))	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 14:06
S50	65	S49 and ((identif $6 or identity) with (user or owner))	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 14:07
S49	372	((proximit$5 or distance) near3 sens$4) near4 microphone	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 14:07
S52	53	S49 and ((identif $6 or identity) near5 (user or owner))	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 14:14
S51	47	S49 and ((identif $6 or identity) near3 (user or owner))	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 14:14
S53	100899	((proximit$5 or distance) near3 sens$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 14:23
S54	3	S49 and ((identif $6 or identity) with (user or owner) with (speech or voice) with (writ$5 or text))	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 14:24
S56	913	((identif$6 or identity) with (user or owner) with (speech or voice) with ($5writ$5 or text))	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 14:26

S55	857	((identif$6 or identity) with (user or owner) with (speech or voice) with (writ$5 or text))	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 14:26
S59	3	S56 and S57	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 14:27
S58	969	S56 and17	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 14:27
S57	493	((proximit$5 or distance or close or far or near$1) near3 sens$4) near4 microphone	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 14:27
S61	51	S56 and S60	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 14:28
S60	154019	((proximit$5 or distance or close or far or near$1) near3 sens$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 14:28
S63	22	S56 and S62	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 14:29
S62	9268	((proximit$5 or distance or close or far or near$1) near3 sens$4) with (user or operator or person or individual)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 14:29
S65	12	S56 and S64	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 14:32
S64	6699	((proximit$5 or distance) near3 sens$4) with (user or operator or person or individual)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 14:32
S67	43	S56 and S66	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 14:34

S68	3	S56 and ((speech or acoustic) near3 model) and (($5writing or writ $5) near3 model) and ((synta$5 or semantic) near3 model)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 14:38
S69	14	S56 and ((speech or acoustic) near3 model) and ((synta $5 or semantic) near3 model)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 14:39
S70	3	S56 and ((speech or acoustic) near3 model) and ((synta $5 with semantic) near3 model)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 14:42
S71	3	S56 and (semantic with synta$6 with model$5)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 14:43
S72	12	S56 and (semantic with model$5)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 14:44
S74	8863	((identif$6 or identity) with (user or owner or operator) with (speech or voice))	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 14:51
S73	8263	((identif$6 or identity) with (user or owner) with (speech or voice))	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 14:51
S75	17	microphone with pen with (identif$6 or identity)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 14:55
S76	206	((proximit$5 or distance) near3 sens$4) with (user or operator or person or individual) with microphone	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 15:01

S77	70	((proximit$5 or distance) near3 sens$4) with (user or operator or person or individual) with microphone with (human or head)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 15:06
S78	68	((proximit$5 or distance) near3 sens$4) with (user or operator or person or individual) with microphone with head	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 15:07
S79	1264	(hand$2writ$6 or written) and (speech or voice) and language and semantic and (syntactic or syntax) and model	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2008/05/22 16:16
S81	8	(hand$2writ$6 or written) same (speech or voice) same language same semantic same (syntactic or syntax) same model	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 16:17
S80	7	(hand$2writ$6 or written) same (speech or voice) same language same semantic same (syntactic or syntax) same model	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2008/05/22 16:17
S83	323	(speech or voice) same model$4 same (hand$2writ $6 or free$2hand)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 16:35
S85	303	(speech or voice) with model$4 with (hand$2writ$6 or free$2hand or writ $5)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 16:44

S84	1057	(speech or voice) same model$4 same (hand$2writ $6 or free$2hand or writ$5)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 16:44
S87	1	((speech or voice) with model$4 with (hand$2writ$6 or free$2hand or writ $5)) same (speech $2to$2text or text $2to$2speech or (speech near3 text)) same tablet	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 16:46
S86	40	((speech or voice) with model$4 with (hand$2writ$6 or free$2hand or writ $5)) same (speech $2to$2text or text $2to$2speech or (speech near3 text))	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 16:46
S88	12	((speech or voice) with model$4 with (hand$2writ$6 or free$2hand)) same (speech$2to $2text or text$2to $2speech or (speech near3 text))	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/22 16:49
S91	7	S89 and tab$5 and speech	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/27 09:34
S90	0	suominen-edwin. in.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/27 09:34
S89	358	suominen.in.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/27 09:34
S92	11880	pim or (person$4 near3 information near3 manag$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/27 11:47
S94	1224	S92 and ((speech or voice) with recogni$6)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/27 11:48
S93	1224	S92 and ((speech or voice) with recogn$6)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/27 11:48

S96	118	S92 and ((speech or voice) with recogni$6) and (hand$2writ$6 or free$2hand) and (error with correc $6)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/27 11:49
S95	388	S92 and ((speech or voice) with recogni$6) and (hand$2writ$6 or free$2hand)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/05/27 11:49
S99	107	S98 and model$7	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/06/02 15:36
S98	119	S97 and ((speech or voice) with recogni$6) and (hand$2writ$6 or free$2hand) and (error with correc $6)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/06/02 15:36
S97	11908	pim or (person$4 near3 information near3 manag$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/06/02 15:36
S100	17	S98 and (model$7 with (speech or voice))	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/06/02 15:41
S101	88	S98 and model$7 and (pen or stylus or pen$3stylus)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2008/06/02 15:49
L2	1	("6285785").PN.	USPAT; USOCR; EPO	OR	OFF	2008/06/04 16:44
L1	1	("5839106").PN.	USPAT; USOCR; EPO	OR	OFF	2008/06/04 16:44
L8	424	(704/257).CCLS.	USPAT; USOCR; EPO	OR	OFF	2008/06/04 16:46
L7	588	(382/187).CCLS.	USPAT; USOCR; EPO	OR	OFF	2008/06/04 16:46
L6	457	(704/235).CCLS.	USPAT; USOCR; EPO	OR	OFF	2008/06/04 16:46
L5	1392	(455/550.1).CCLS.	USPAT; USOCR; EPO	OR	OFF	2008/06/04 16:46
L4	932	(382/124).CCLS.	USPAT; USOCR; EPO	OR	OFF	2008/06/04 16:46
L3	54	(379/56.1).CCLS.	USPAT; USOCR; EPO	OR	OFF	2008/06/04 16:46

L15	306	8 and speech and recognition and model$6	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2008/06/04 16:47
L14	66	7 and speech and recognition and model$6	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2008/06/04 16:47
L13	231	6 and speech and recognition and model$6	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2008/06/04 16:47
L12	12	5 and speech and recognition and model$6	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2008/06/04 16:47
L11	9	4 and speech and recognition and model$6	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2008/06/04 16:47
L10	9	4 and speech and recognition and model$6	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2008/06/04 16:47
L9	0	3 and speech and recognition and model$6	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2008/06/04 16:47

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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11088032	SUOMINEN, EDWIN A.
	Examiner	Art Unit
	Colucci, Michael C	2626

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/05/2007	06/04/2008							
	81	✓	✓							
	82	✓	✓							
	83	✓	✓							
	84	✓	✓							
	85	✓	✓							
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	95		✓							
	96		✓							
	97		✓							
	98		✓							
	99		✓							
	100		✓							

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11088032	SUOMINEN, EDWIN A.
	Examiner	Art Unit
	Colucci, Michael C	2626

SEARCHED

Class	Subclass	Date	Examiner
382	187	11/5/2007	MC
704	256, 270	11/5/2007	MC
704	235, 257	6/4/2008	MC
379	56.1	6/4/2008	MC
382	124, 187	6/4/2008	MC
455	550.1	6/4/2008	MC
		6/4/2008	MC

SEARCH NOTES

Search Notes	Date	Examiner
Searched 382/187 with keyword limitations	11/5/2007	MC
Searched 704/256 with keyword limitations	11/5/2007	MC
Searched 704/270 with keyword limitations	11/5/2007	MC
Consulted SPE Richemond Dorvil	11/5/2007	MC
Searched 704/235 with keyword limitations	6/4/2008	MC
Searched 704/257 with keyword limitations	6/4/2008	MC
Searched 379/56.1 with keyword limitations	6/4/2008	MC
Searched 382/124 with keyword limitations	6/4/2008	MC
Searched 455/550.1 with keyword limitations	6/4/2008	MC
Searched 382/187 with keyword limitations	6/4/2008	MC
Performed a double patenting search	5/27/2008	MC
Performed an inventors search	5/27/2008	MC
Consulted SPE Richemond Dorvil	5/27/2008	MC
Consulted Primary Examiner Talivaldis Smits	5/27/2008	MC

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: **Edwin A. Suominen**	Confirmation No.: **6401**
Application No.: **11/088,032**	Group Art Unit: **2626**
Filing Date: **March 22, 2005**	Examiner: **Michael C. Colucci**

For: **Message Recognition Using Shared Language Model**

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

Sir:

REPLY PURSUANT TO 37 CFR § 1.111

In response to the Official Action dated **November 15, 2007**, reconsideration is respectfully requested in view of the amendments and/or remarks as indicated below:

☐ **Amendments to the Specification** begin on page of this paper.

☒ **Amendments to the Claims** are reflected in the listing of the claims which begins on page 2 of this paper.

☐ **Amendments to the Drawings** begin on page of this paper and include an attached replacement sheet.

☒ **Remarks** begin on page 6 of this paper.

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

Listing of Claims:

Claims 1-80 (canceled)

Claim 81 (currently amended) A system for generating text responsive to both voice and handwriting input, comprising:

(a) a microphone;

(b) a stylus; [[and]]

(c) a tablet including (1) a tablet surface, (2) a flat-panel display integrated into the tablet surface and responsive to freehand input conveyed via manipulation of the stylus on or near the tablet surface to render ink-like indicia of the freehand input, and (3) a message recognizer including a speech recognizer and a handwriting recognizer;

(d) wherein the speech recognizer is responsive to voice input conveyed via the microphone to provide text data in accordance with both a shared language model and an acoustic model; and

(e) the handwriting recognizer is responsive to freehand input conveyed via the stylus to provide text data in accordance with both the shared language model and a handwriting model.

Claim 82 (currently amended) The system of claim 81 wherein the microphone is ~~not head-mounted~~ mounted substantially beyond an immediate vicinity of the head of an individual.

Claim 83 (previously presented) The system of claim 82 wherein the microphone is housed in the stylus.

Claim 84 (currently amended) The system of claim [[1]] 81 wherein the shared language model is trainable responsive to user correction of misrecognition by either the speech recognizer or the handwriting recognizer, thereby improving accuracy of both.

Claim 85 (currently amended) The system of claim [[1]] 81 wherein:

(a) the speech ~~recognizes~~ recognizer provides text data without being

responsive to freehand input supplied to the [[the]] handwriting ~~recognizes~~ recognizer; and

(b) the handwriting recognizer provides text data without being responsive to voice input supplied to the [[the]] speech recognizer.

Claim 86 (new) The system of claim 81, wherein said stylus is equipped with a proximity sensor that is configured to sense a proximity of a human head to said microphone.

Claim 87 (new) The system of claim 81, wherein said stylus is equipped with an identification circuit that is configured to identify an owner of said stylus.

Claim 88 (new) The system of claim 81, wherein at least one of said speech recognizer and said handwriting recognizer is configured to be responsive to an identifying signal to select a particular user message model to use when generating text responsive to said voice input.

Claim 89 (new) The system of claim 88, wherein said particular user message model is remotely available over a wide area network.

Claim 90 (new) The system of claim 81, further comprising a unified message model that includes said acoustic model, said handwriting model, and said shared language model, wherein said shared language model includes a syntactic model and a semantic model.

Claim 91 (new) The system of claim 90, wherein said semantic model comprises at least one of:

(a) a semantic cluster of a first type that is a mathematically derived group of vectors representing text segments;

(b) a semantic cluster of a second type that is a discrete grouping of text that has a particular context; and

(c) a semantic cluster of a third type that is defined with respect to an individual

reference word that is considered to be indicative of a particular context.

Claim 92 (new) The system of claim 81, further comprising an activation circuit that is configured to sense when a user moves said stylus away from said user's mouth and toward said tablet in order to configure said tablet for editing.

Claim 93 (new) The system of claim 81, wherein a user message model is an instantiation for a particular user of said shared language model, said acoustic model, and said handwriting model.

Claim 94 (new) The system of claim 93, wherein said user message model is local to said system.

Claim 95 (new) The system of claim 94, wherein said user message model is implemented in a virtual machine.

Claim 96 (new) The system of claim 93, wherein said user message model is remotely stored in a database.

Claim 97 (new) A method for generating text responsive to both voice and handwriting input, comprising:

activating a speech recognizer and a handwriting recognizer;

processing with said speech recognizer voice input conveyed via a microphone to provide a first text data in accordance with both a shared language model and an acoustic model;

processing with said handwriting recognizer hand input conveyed via a stylus to provide a second text data in accordance with both the shared language model and a handwriting model; and

generating a third text data based on a combination of said speech recognizer processing and said handwriting recognizer processing.

Claim 98 (new) The method according to claim 97, further comprising switching modes from processing input with said speech recognizer to processing input with said handwriting recognizer when said stylus moves away from a user's mouth and towards a tablet.

Claim 99 (new) A method for receiving and processing a plurality of different types of input and converting said inputs into text data, comprising:

receiving voice input, wherein said voice input is conveyed via a stylus mounted microphone;

receiving writing input, wherein said writing input is conveyed via a tablet surface;

responding to said voice input with a speech recognizer, wherein said speech recognizer is configured to provide text data in accordance with both a shared language model and an acoustic model;

responding to said writing input with a writing recognizer, wherein said writing recognizer is configured to provide text data in accordance with both the shared language model and a writing model; and

resolving text input from said speech recognizer in accordance with text input from said writing recognizer.

Claim 100 (new) The method according to claim 99, further comprising accessing at least one of said shared language model, said acoustic model and said writing model via a network.

REMARKS

According to the present office action, claims 81-85 are pending in the application. These same claims stand rejected.

Claims 86-100 have been newly added.

Telephonic Interview

On January 14, 2008, examiner Michael C. Colucci, supervising examiner Talivaldis Smits, and the undersigned conducted a telephonic interview. The substance of said interview is hereby incorporated into the below remarks.

Claim Rejections – 35 U.S.C. § 103

Claim 81, in relevant part, recites the following:

> (d) wherein the speech recognizer is responsive to voice input conveyed via the microphone to provide text data in accordance with both ***a shared language model and an acoustic model***; and
>
> (e) the handwriting recognizer is responsive to freehand input conveyed via the stylus to provide text data in accordance with both ***the shared language model and a handwriting model***.

(emphasis added). Thus, voice input is used to provide text data in accordance with both a shared language model and an acoustic model, and moreover, the freehand input is used to provide text data in accordance with the same shared language model and a handwriting model. Applicant respectfully submits that the cited art does not disclose such a combination of models used in generating text data.

In the office action, U.S. Patent No. 5,737,490 (Austin et al.) (disclosing hidden Markov models used in speech recognition, at col. 1, ll. 19-35) is used to reject element (d) of claim 81; and, U.S. Patent No. 5,841,901 (Arai et al.) (disclosing a plurality of dictionaries having patterns that are compared to handwritten input, at col. 2, ll. 15-26) is used to reject element (e) of claim 81. Office Action, pp. 3-4.

As was explained during the telephonic interview, (1) the hidden Markov model and (2) the plurality of dictionaries with handwriting patterns disclosed in the cited art cannot be used to reject the recited elements in claim 1: an (1) "an acoustic model," (2) "a handwriting model" ***and*** (3) "a shared language model" for both (1) and (2). Simply put, the notion of a ***shared language model*** to ***both*** an acoustic model ***and*** a handwriting model is not disclosed by the cited art. *See* claim 1.

The other independent claims, namely, claims 97 and 99 recite similar subject matter. Insofar as the dependent claims incorporate the limitations from their respective independent claims, they also define over the cited art for at least similar reasons.

Should the examiner have any questions and/or concerns, the undersigned can be readily contacted at 206-903-2461.

CONCLUSION

In view of the foregoing amendments and remarks, applicant respectfully submits that the present application is in condition for allowance. Reconsideration of the application and an early Notice of Allowance are respectfully requested. In the event that the examiner cannot allow the application for any reason, the examiner is encouraged to contact applicant's representative.

Date: March 17, 2008

/ Grzegorz S. Plichta /
Grzegorz S. Plichta
Registration No. 55,541

Woodcock Washburn LLP
Cira Centre
2929 Arch Street, 12th Floor
Philadelphia, PA 19104-2891
Telephone: (215) 568-3100
Facsimile: (215) 568-3439

Electronic Patent Application Fee Transmittal

Application Number:	11088032
Filing Date:	22-Mar-2005
Title of Invention:	Message recognition using shared language model
First Named Inventor/Applicant Name:	Edwin A. Suominen
Filer:	Grzegorz Seweryn Plichta
Attorney Docket Number:	**OR-0005
Filed as Large Entity	

Utility Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 1 month with $0 paid	1251	1	120	120

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**120**

Electronic Acknowledgement Receipt	
EFS ID:	3009612
Application Number:	11088032
International Application Number:	
Confirmation Number:	6401
Title of Invention:	Message recognition using shared language model
First Named Inventor/Applicant Name:	Edwin A. Suominen
Customer Number:	23377
Filer:	Grzegorz Seweryn Plichta
Filer Authorized By:	
Attorney Docket Number:	**OR-0005
Receipt Date:	17-MAR-2008
Filing Date:	22-MAR-2005
Time Stamp:	15:43:59
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$120
RAM confirmation Number	984
Deposit Account	233050
Authorized User	
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	ivor5Transmittal.pdf	51109 cf9088451f241f0fd5ca87ff8d20e9522bfbb702	no	1
Warnings:					
Information:					
2	Extension of Time	ivor5Extension.pdf	56474 c6febc3bfa873820d688b7d54a5e4d11611c4ee7	no	1
Warnings:					
Information:					
3		ivor5Response.pdf	50281 d0dd55f04f6133747079f72491e0d77e929ca42e	yes	7

Multipart Description/PDF files in .zip description

Document Description	Start	End
Amendment - After Non-Final Rejection	1	1
Claims	2	5
Applicant Arguments/Remarks Made in an Amendment	6	7

Warnings:					
Information:					
4	Fee Worksheet (PTO-06)	fee-info.pdf	8145 4d94a8deffdda73b74c87dd65ac6e7196b185e82	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	166009	

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/21 (01-08)
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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	11/088,032
Filing Date	March 22, 2005
First Named Inventor	Edwin A. Suominen
Art Unit	2626
Examiner Name	Michael C. Colucci
Attorney Docket Number	**OR-0005

Total Number of Pages in This Submission: 9

ENCLOSURES *(Check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☑ Amendment/Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
  - ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) _____
  - ☐ Landscape Table on CD
- ☐ After Allowance Communication to TC
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- ☐ Proprietary Information
- ☐ Status Letter
- ☐ Other Enclosure(s) (please Identify below):

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Woodcock Washburn LLP		
Signature	/ Grzegorz S. Plichta /		
Printed name	Grzegorz S. Plichta		
Date	March 17, 2008	Reg. No.	55,541

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Typed or printed name		Date	

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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a) FY 2008 (*Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).*)	Docket Number (Optional) **OR-0005
Application Number 11/088,032	Filed March 22, 2005
For Message Recognition Using Shared Language Model	
Art Unit 2626	Examiner Michael C. Colucci

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

		Fee	Small Entity Fee	
[X]	One month (37 CFR 1.17(a)(1))	$120	$60	$ 120.00
[ ]	Two months (37 CFR 1.17(a)(2))	$460	$230	$
[ ]	Three months (37 CFR 1.17(a)(3))	$1050	$525	$
[ ]	Four months (37 CFR 1.17(a)(4))	$1640	$820	$
[ ]	Five months (37 CFR 1.17(a)(5))	$2230	$1115	$

[ ] Applicant claims small entity status. See 37 CFR 1.27.

[ ] A check in the amount of the fee is enclosed.

[ ] Payment by credit card. Form PTO-2038 is attached.

[X] The Director has already been authorized to charge fees in this application to a Deposit Account.

[X] The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 233050. I have enclosed a duplicate copy of this sheet.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

[ ] applicant/inventor.

[ ] assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/96).

[X] attorney or agent of record. Registration Number 55,541

[ ] attorney or agent under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____

/ Grzegorz S. Plichta / — Signature

March 17, 2008 — Date

Grzegorz S. Plichta — Typed or printed name

(206) 332-1380 — Telephone Number

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

[ ] Total of _____ forms are submitted.

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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a) FY 2008 (*Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).*)	Docket Number (Optional) **OR-0005
Application Number 11/088,032	Filed March 22, 2005
For Message Recognition Using Shared Language Model	
Art Unit 2626	Examiner Michael C. Colucci

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		Fee	Small Entity Fee	
[X]	One month (37 CFR 1.17(a)(1))	$120	$60	$ 120.00
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[ ]	Four months (37 CFR 1.17(a)(4))	$1640	$820	$
[ ]	Five months (37 CFR 1.17(a)(5))	$2230	$1115	$

[ ] Applicant claims small entity status. See 37 CFR 1.27.

[ ] A check in the amount of the fee is enclosed.

[ ] Payment by credit card. Form PTO-2038 is attached.

[X] The Director has already been authorized to charge fees in this application to a Deposit Account.

[X] The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 233050. I have enclosed a duplicate copy of this sheet.

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I am the

[ ] applicant/inventor.

[ ] assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/96).

[X] attorney or agent of record. Registration Number 55,541

[ ] attorney or agent under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____

/ Grzegorz S. Plichta / — Signature

March 17, 2008 — Date

Grzegorz S. Plichta — Typed or printed name

(206) 332-1380 — Telephone Number

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

[ ] Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.136(a). 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 6 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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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 11/088,032	Filing Date 03/22/2005	☐ To be Mailed

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☒		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

		(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
	03/16/2008	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
AMENDMENT	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0	X $25 =	0	OR	X $ =	
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $105 =	0	OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE	0	OR	TOTAL ADD'L FEE	

		(Column 1)		(Column 2)	(Column 3)					
		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
AMENDMENT	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L 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.

Legal Instrument Examiner:
/LINDA A. WASHINGTON/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/088,032	03/22/2005	Edwin A. Suominen	**OR-0005	6401

23377 7590 01/17/2008
WOODCOCK WASHBURN LLP
CIRA CENTRE, 12TH FLOOR
2929 ARCH STREET
PHILADELPHIA, PA 19104-2891

EXAMINER	
COLUCCI, MICHAEL C	

ART UNIT	PAPER NUMBER
2626	

MAIL DATE	DELIVERY MODE
01/17/2008	PAPER

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

The time period for reply, if any, is set in the attached communication.

Interview Summary	Application No.	Applicant(s)	
	11/088,032	SUOMINEN, EDWIN A.	
	Examiner	Art Unit	
	Michael C. Colucci	2626	

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

(1) *Michael C. Colucci*. (3)*Greg S. Plichta*.

(2) *Talivaldis Smits*. (4)_____.

Date of Interview: *14 January 2008*.

Type: a)☒ Telephonic b)☐ Video Conference
c)☐ Personal [copy given to: 1)☐ applicant 2)☐ applicant's representative]

Exhibit shown or demonstration conducted: d)☐ Yes e)☒ No.
If Yes, brief description: _____.

Claim(s) discussed: *81, 82, and 84*.

Identification of prior art discussed: *US 5841901, US 5737490, US 4969180*.

Agreement with respect to the claims f)☐ was reached. g)☒ was not reached. h)☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: *See Continuation Sheet*.

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

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN A NON-EXTENDABLE PERIOD OF THE LONGER OF ONE MONTH OR THIRTY DAYS FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.

_____
Examiner's signature, if required

Continuation of Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: Proposed amendments to the claims were discussed during the interview. The amendments pertained to a probabilistic equation on page 44 of Applicants specification. Additionally, a potential further limitation of a "shared language model" was discussed. Other discussion included whether the current prior art would overcome a stylus/microphone combo as part of the independent claim 81. A potential limitation of additiona processing taking place within the stylus was also discussed. Claim 84 was also discussed regarding a trainable shared language model. Overall, the interview pertained to a further limitation of the claims as well as possibly moving dependent claims into the independent claim.

TALIVALDIS IVARS SMITS
PRIMARY EXAMINER

PTO/SB/122 (01-06)
Approved for use through 12/31/2008. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application

Address to:
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Application Number	11/088,032
Filing Date	March 22, 2005
First Named Inventor	Edwin Suominen
Art Unit	2626
Examiner Name	Michael C. Colucci
Attorney Docket Number	**OR-0005

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I am the:

☐ Applicant/Inventor

☐ Assignee of record of the entire interest.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

☑ Attorney or agent of record. Registration Number 34,734

☐ Registered practitioner named in the application transmittal letter in an application without an executed oath or declaration. See 37 CFR 1.33(a)(1). Registration Number_____.

Signature

Typed or Printed Name Michael D. Stein

Date 11/20/2007	Telephone 206-332-1380

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _____forms are submitted.

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Electronic Acknowledgement Receipt	
EFS ID:	2491472
Application Number:	11088032
International Application Number:	
Confirmation Number:	6401
Title of Invention:	Message recognition using shared language model
First Named Inventor/Applicant Name:	Edwin A. Suominen
Correspondence Address:	Michael D. Stein WOODCOCK WASHBURN LLP 46th Floor One Liberty Place Philadelphia PA 19103 US 2155683100 -
Filer:	Michael David Stein/Chelsey McKnight
Filer Authorized By:	Michael David Stein
Attorney Docket Number:	IVOR-0005
Receipt Date:	20-NOV-2007
Filing Date:	22-MAR-2005
Time Stamp:	13:05:14
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)
1	Change of Address	OR-0005_changeaddress.pdf	27229 0c35c7f84c38a6610516128e7bee7bb6d9f3d7bc	no	1
Warnings:					
Information:					
		Total Files Size (in bytes):	27229		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/088,032	03/22/2005	Edwin A. Suominen	IVOR-0005	6401

7590 11/15/2007

Michael D. Stein
WOODCOCK WASHBURN LLP
46th Floor
One Liberty Place
Philadelphia, PA 19103

EXAMINER	
COLUCCI, MICHAEL C	
ART UNIT	PAPER NUMBER
2626	
MAIL DATE	DELIVERY MODE
11/15/2007	PAPER

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

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	11/088,032	SUOMINEN, EDWIN A.	
	Examiner	Art Unit	
	Michael C. Colucci	2626	

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

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

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

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

Disposition of Claims

4)☒ Claim(s) *81-85* is/are pending in the application.

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

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *81-85* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

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

Application Papers

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

10)☒ The drawing(s) filed on *22 March 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

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

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

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

Priority under 35 U.S.C. § 119

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

a)☐ All b)☐ Some * c)☐ None of:

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

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

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

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

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *03/22/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 84 and 85 objected to because of the following informalities: Claims 84 and 85 are both dependent upon *claim 1*, which has been canceled. Examiner construes claims 84 and 85 as being dependent on claim 81 in lieu of claim 1. Appropriate correction is required.

Claim Rejections - 35 USC § 103

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

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 81-83 and 85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arai et al US 5841901 A (hereinafter Arai) in view of Austin et al US 5737490 A (hereinafter Austin).

Re claim 81, Arai teaches Claim 81 a system for generating text responsive to both voice and handwriting input, comprising:

(a) a microphone;

(b) a stylus ("The document processing system comprises a coordinate reader (for example, an electromagnetic tablet) 101, a stylus or pen 102 for inputting coordinate values, a display unit (for example, a liquid-crystal display unit) 103, an information processor 104, a handwritten character recognition controller"; col 3 line 33-46);

(c) a tablet including (1) a tablet surface, (2) a fiat-panel display integrated into the tablet surface ("The document processing system comprises a coordinate reader (for example, an electromagnetic tablet) 101, a stylus or pen 102 for inputting coordinate values, a display unit (for example, a liquid-crystal display unit) 103, an information processor 104, a handwritten character recognition controller"; col 3 line 33-46) and responsive to freehand input conveyed via manipulation of the stylus on or near the tablet surface to render ink-like indicia of the freehand input ("Character input areas 202 and 203 are areas for entering handwritten characters, and the user writes the characters therein with the stylus 102."; col 4 line 17-33), and (3) a message recognizer including a speech recognizer and a handwriting recognizer ("Online pattern recognition technique is utilized for a user interface. Examples of online pattern recognition are handwritten character recognition and speech recognition. The pattern recognition systems include, for example, document processing systems"; col 1 line 13-21);

(e) the handwriting recognizer is responsive to freehand input conveyed via the stylus to provide text data ("When the user starts to write the first stroke of a character in the character input area 202, a symbol or a character is inserted instead of the result of recognition...when the result is obtained, the symbol is replaced by the result of

recognition" col 17 line 13-36; & Figure 13 a-d) in accordance with both the shared language model and a handwriting model ("and recognition means for comparing handwritten input information with patterns contained in the plurality of dictionaries so as to recognize the most similar pattern"; col 2 line 15-26).

However Arai fails to teach, but Austin teaches (d) wherein the speech recognizer is responsive to voice input conveyed via the microphone to provide text data in accordance with both a shared language model and an acoustic model ("A Markov model for each fragment of speech is created. The Markov models for each of the sounds are then concatenated together to form a sequence of Markov models that depict an acoustical definition of the word in the vocabulary...The Markov models for each of the sounds are then concatenated together to form a sequence of Markov models that depict an acoustical definition of the word in the vocabulary"; Austin col 1 line 19-35);

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention a message recognizer having a speech recognizer responsive to voice input to provide text data using a language and acoustic model. Having a speech recognizer in combination with a freehand handwriting recognizer would aid in achieving a higher accuracy of input data, where if the handwriting mechanism fails, the speech recognition unit can be used to input the appropriate text through a microphone.

Re claim 82, Arai fails to teach, but Austin teaches the system of claim 81 wherein the microphone is not head-mounted ("a standard microphone 319 to input

audio or voice data to be processed and stored by the computer system, an analog-to-digital converter 320 coupled to the microphone 319 and the bus 310 to transform analog voice data from the microphone 319 to digital form which can be processed by the computer system"; Austin col 6 line 6-36 & Figure 3b item 329).

Austin teaches a standard microphone as part of a computer system, where a standard microphone is construed as a handheld or computer mounted microphone.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention using a microphone that is not head mounted. Having a microphone that is not head mounted or implemented as part of the computer system itself would allow for a convenient system that would be completely hands free allowing the user to handle only the stylus and tablet alone.

Re claim 84, Arai teaches responding to user correction of misrecognition by either the speech recognizer or the handwriting recognizer, thereby improving accuracy of both ("the degrees of fitting of the respective handwritten character recognizers to the user are changed by the result of the user's correction of the misrecognition, whereby the estimation of the correct answer can be rendered more reliable"; col 10 line 23-44)

However Arai fails to teach, but Austin teaches the system of claim 81 wherein the shared language model is trainable ("The training data is then signal processed into a sequence of acoustic vectors (processing block 202). The acoustic vectors derived from the training data are then aligned with linear phonetic Markov models"; Austin col 5 line 29-47 & Figure 2 items 201 and 202).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention a shared language model trainable responsive to user correction of misrecognition by the speech/handwriting recognizer, to improve accuracy. A user training a language model by correcting input would allow for a user to have a broader candidate text range available due to correction upon the entry of handwriting or speech as an option whereby a more accurate interpretation is produced via the user.

Re claim 85, Arai teaches the system of claim 81 wherein:

(b) the handwriting recognizer provides text data without being responsive to voice input supplied to the speech recognizer ("Character input areas 202 and 203 are areas for entering handwritten characters, and the user writes the characters therein with the stylus 102."; col 4 line 17-33).

However Arai fails to teach, but Austin teaches (a) the speech recognizer provides text data without being responsive to freehand input supplied to the handwriting recognizer ("a standard microphone 319 to input audio or voice data to be processed and stored by the computer system, an analog-to-digital converter 320 coupled to the microphone 319 and the bus 310 to transform analog voice data from the microphone 319 to digital form which can be processed by the computer system"; Austin col 6 line 6-36 & Figure 3b item 329);

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use speech recognition to handle speech and not handwritten data and handwriting recognition to handle handwriting and not speech recognition, in

order to provide text data. It would have been obvious to one of ordinary skill in the art to use a handwriting recognizer to provide text independently from a speech recognizer to provide text when no error correction is needed.

4. Claim 83 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arai et al US 5841901 A (hereinafter Arai) in view of Austin et al US 5737490 A (hereinafter Austin) and further in view of Watterson et al US 4969180 A (hereinafter Watterson).

Re claim 83, Arai in view of Austin fail to teach, but Watterson teaches the system of claim 82 wherein the microphone is housed in the stylus (""a functional writing pen as a cordless handset incorporating a microphone and speaker unit, which can conveniently serve as both a pen and a telephone handset for normal telephone conversation; Watterson col 2 line 11-20).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention a microphone housed in a stylus. Housing a microphone within a writing instrument such as a stylus would allow for hands-free communication with a speech recognition system to provide a more convenient means for a user to input data through by handwriting and/or speech and not holding a microphone in addition to a stylus.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 5313557 A, US 5396443 A, and US 6173259 B1.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael C. Colucci whose telephone number is (571)-270-1847. The examiner can normally be reached on 9:30 am - 6:00 pm, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571)-272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RICHEMOND DORVIL
SUPERVISORY PATENT EXAMINER

Michael Colucci Jr.
Patent Examiner
AU 2626
(571)-270-1847
Michael.Colucci@uspto.gov

OIPE IAP50
MAR 22 2006
PATENT & TRADEMARK OFFICE

Form PTO-1449 Modified List of Patent and Publications Cited by Applicant (Use several sheets if necessary) U.S. Department of Commerce Patent and Trademark Office	Docket No. IVOR-0005	Application No. 11/088,032
	Applicant Edwin A. Suominen	
	Filing Date March 22, 2005	Group 2654
	Confirmation No. 6401	

U. S. PATENT DOCUMENTS

Examiner Initial		Document No.	Date	Name	Class	Subclass
/M.C./	1	4,969,180	11/06/90	Watterson et al.	379	58
	2	5,049,862	09/17/91	Dao et al.	340	706
	3	5,150,424	09/22/92	Aguro et al.	382	13
	4	5,349,139	09/20/94	Verrier et al.	178	19
	5	5,425,129	06/13/95	Garman et al.	395	2.65
	6	5,434,777	07/18/95	Luciw	364	419.13
	7	5,467,102	11/14/95	Kuno et al.	345	1
	8	5,502,774	03/26/96	Bellegarda et al.	382	159
	9	5,546,538	08/13/96	Cobbley et al.	395	200.01
	10	5,546,565	08/13/96	Suzuki	395	500
	11	5,574,804	11/12/96	Olschafskie et al.	382	313
	12	5,581,783	12/03/96	Ohashi	395	825
	13	5,587,559	12/24/96	Fleck et al.	178	18
	14	5,594,640	01/14/97	Capps et al.	395	794
	15	5,621,809	04/15/97	Bellegarda et al.	704	251
	16	5,666,438	09/09/97	Beernink et al.	382	189
	17	5,682,439	10/28/97	Beernink et al.	382	187
	18	5,694,150	12/02/97	Sigona et al.	345	145
	19	5,740,364	04/14/98	Drerup	395	200.09

EXAMINER /Michael Colucci/	**DATE CONSIDERED** 11/05/2007

Form PTO-1449 Modified List of Patent and Publications Cited by Applicant (Use several sheets if necessary) U.S. Department of Commerce Patent and Trademark Office	Docket No. IVOR-0005	Application No. 11/088,032
	Applicant Edwin A. Suominen	
	Filing Date March 22, 2005	Group 2654
	Confirmation No. 6401	

U. S. PATENT DOCUMENTS

Examiner Initial		Document No.	Date	Name	Class	Subclass
/M.C./	20	5,787,455	07/28/98	Seybold	711	100
	21	5,818,949	10/06/98	Deremer et al.	381	172
	22	5,828,999	10/27/98	Bellegarda et al.	704	240
	23	5,839,106	11/17/98	Bellegarda	704	257
	24	5,850,058	12/15/98	Tano et al.	178	18.01
	25	5,855,000	12/29/98	Waibel et al.	704	235
	26	5,870,492	02/09/99	Shimizu et al.	382	187
	27	5,870,706	02/09/99	Alshawi	704	255
	28	5,899,976	05/04/99	Rozak	704	270
	29	5,917,942	06/29/99	Ehsani et al.	382	189
	30	5,920,837	07/06/99	Gould et al.	704	251
	31	5,937,422	08/10/99	Nelson et al.	707	531
	32	5,946,499	08/31/99	Saunders	395	893
	33	5,991,726	11/23/99	Immarco et al.	704	270
	34	6,154,722	11/28/00	Bellegarda	704	257
	35	6,167,376	12/26/00	Ditzik	704	235
	36	6,285,785	09/04/01	Bellegarda et al.	382	187
	37	6,292,857 B1	09/2001	Sidoroff et al.	704	231
↓	38	6,340,967	01/22/02	Maxted	345	179

EXAMINER	/Michael Colucci/	DATE CONSIDERED	11/05/2007

Form PTO-1449 Modified List of Patent and Publications Cited by Applicant (Use several sheets if necessary) U.S. Department of Commerce Patent and Trademark Office	Docket No. IVOR-0005	Application No. 11/088,032
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	Filing Date March 22, 2005	Group 2654
	Confirmation No. 6401	

U. S. PATENT DOCUMENTS

Examiner Initial		Document No.	Date	Name	Class	Subclass
/M.C./	39	6,363,348	03/26/02	Besling et al.	704	270.1
	40	6,393,395	05/21/02	Guha et al.	704	232
	41	6,415,256 B1	07/02/02	Ditzik	704	231
	42	6,438,523 B1	08/20/02	Oberteuffer et al.	704	270
	43	6,446,041 B1	09/03/02	Reynar et al.	704	260
	44	6,456,975	09/24/02	Chang	704	270.1
	45	6,513,005 B1	01/28/03	Qin et al.	704	254
	46	2002/0075300	06/20/02	Tang et al.	345	744
	47	2002/0178008	11/28/02	Reynar	704	272
	48	2003/0189603	10/09/03	Goyal et al.	345	863
	49	2003/0212961	11/13/03	Soin et al.	715	530
	50	2003/0216913	11/20/03	Keely et al.	704	235
	51	2003/0233237	12/18/03	Garside et al.	704	270

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EXAMINER	/Michael Colucci/	**DATE CONSIDERED**	11/05/2007

Form PTO-1449 Modified List of Patent and Publications Cited by Applicant (Use several sheets if necessary) U.S. Department of Commerce Patent and Trademark Office	Docket No. IVOR-0005	Application No. 11/088,032
	Applicant Edwin A. Suominen	
	Filing Date March 22, 2005	Group 2654
	Confirmation No. 6401	

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Examiner Initial		Document No.	Date	Country	Translation YES	Translation NO
/M.C./	52	01/82127	11/01/01	WO		
/M.C./	53	95/25236	09/21/95	WO		
/M.C./	54	0 622 724	04/15/94	EP		

EXAMINER	/Michael Colucci/	DATE CONSIDERED	11/05/2007

Form PTO-1449 Modified List of Patent and Publications Cited by Applicant (Use several sheets if necessary) U.S. Department of Commerce Patent and Trademark Office	Docket No. IVOR-0005	Application No. 11/088,032
	Applicant Edwin A. Suominen	
	Filing Date March 22, 2005	Group 2654
	Confirmation No. 6401	

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/M.C./	66	A. EL-Yacoubi, et al. "An HMM-Based Approach for Off-Line Unconstrained Handwritten Word Modeling and Recognition," IEEE Transactions on Pattern Analysis and Machine Intelligence, Vol. 21, No. 8, August 1999.
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EXAMINER	/Michael Colucci/	DATE CONSIDERED	11/05/2007

Notice of References Cited	Application/Control No. 1	Applicant(s)/Patent Under Reexamination SUOMINEN, EDWIN A.	
	Examiner Michael C. Colucci	Art Unit 2626	Page 1 of 1

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-4,969,180 A	11-1990	Watterson et al.	379/56.1
*	B	US-5,313,557 A	05-1994	Osterhout, Ralph	704/272
*	C	US-5,396,443 A	03-1995	Mese et al.	713/321
*	D	US-5,737,490 A	04-1998	Austin et al.	704/256
*	E	US-5,841,901 A	11-1998	Arai et al.	382/187
*	F	US-6,173,259 B1	01-2001	Bijl et al.	704/270
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
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	Q					
	R					
	S					
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NON-PATENT DOCUMENTS

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

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

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11088032	SUOMINEN, EDWIN A.
	Examiner	Art Unit
	Colucci, Michael C	2626

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/05/2007								
	81	✓								
	82	✓								
	83	✓								
	84	✓								
	85	✓								

☒

Bib Data Sheet

CONFIRMATION NO. 6401

SERIAL NUMBER	FILING OR 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
11/088,032	03/22/2005 RULE	704	2626	IVOR-0005

APPLICANTS

Edwin A. Suominen, Valley, WA;

**** CONTINUING DATA ***************************

This application is a CON of 10/061,052 01/28/2002 PAT 6,904,405 which is a CON of 09/616,157 07/14/2000 ABN
which claims benefit of 60/144,481 07/17/1999 MC

**** FOREIGN APPLICATIONS ******************** MC

IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** SMALL ENTITY **
** 04/25/2005

		STATE OR COUNTRY	SHEETS DRAWING	TOTAL CLAIMS	INDEPENDENT CLAIMS
Foreign Priority claimed	☐ yes ☒ no	WA	17	5	1
35 USC 119 (a-d) conditions met	☐ yes ☒ no ☐ Met after Allowance				
Verified and Acknowledged	Examiner's Signature MC Initials				

ADDRESS

Michael D. Stein
WOODCOCK WASHBURN LLP
46th Floor
One Liberty Place
Philadelphia, PA19103

TITLE

Message recognition using shared language model

FILING FEE RECEIVED		
500	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11088032	SUOMINEN, EDWIN A.
	Examiner	Art Unit
	Colucci, Michael C	2626

SEARCHED			
Class	Subclass	Date	Examiner
382	187	11/5/2007	MC
704	256	11/5/2007	MC
704	270	11/5/2007	MC

SEARCH NOTES		
Search Notes	Date	Examiner
Searched 382/187 with keyword limitations	11/5/2007	MC
Searched 704/256 with keyword limitations	11/5/2007	MC
Searched 704/270 with keyword limitations	11/5/2007	MC
Consulted SPE Richemond Dorvil	11/5/2007	MC

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L8	17	4 and stylus and microphone and speech and hand$2writ$6	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/05 15:13
L9	14	5 and stylus and microphone and speech and hand$2writ$6	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/05 15:13
L5	515	(382/187).CCLS.	USPAT; USOCR	OR	OFF	2007/11/05 15:12
L6	4	3 and (stylus with microphone)	US-PGPUB; USPAT; JPO; DERWENT	OR	OFF	2007/11/05 15:12
L7	4	3 and stylus and microphone and speech and hand$2writ$6	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/05 15:12
L3	305	(704/256).CCLS.	USPAT; USOCR	OR	OFF	2007/11/05 15:11
L4	1287	(704/270).CCLS.	USPAT; USOCR	OR	OFF	2007/11/05 15:11
S33	17	S32 and microphone and (pen or stylus)	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/05 10:57
S35	9	S32 and microphone and (pen or stylus) and wireless$4	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/05 10:57
S36	0	S32 and microphone and (pen or stylus) and chordless$4	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/05 10:57
S34	9	S32 and microphone and (pen or stylus) and wireless	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/05 10:56
S32	17	microphone with (locat$5 or hous$4) with (stylus or pen) with writ$6	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/05 10:50
S23	178	microphone with (locat$5 or hous$4) with (stylus or pen)	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/05 10:49

EAST Search History

S28	2	S23 and S26	US-PGPUB; USPAT; JPO; DERWENT	OR	OFF	2007/11/05 10:47
S30	32806	("382").CLAS.	USPAT; USOCR	OR	OFF	2007/11/05 10:47
S31	4	S23 and S30	US-PGPUB; USPAT; JPO; DERWENT	OR	OFF	2007/11/05 10:47
S29	1	S28 and microphone and pen	US-PGPUB; USPAT; JPO; DERWENT	OR	OFF	2007/11/05 10:41
S26	13091	("704").CLAS.	USPAT; USOCR	OR	OFF	2007/11/05 10:38
S27	6	S25 and S26	US-PGPUB; USPAT; JPO; DERWENT	OR	OFF	2007/11/05 10:38
S24	589	(hand$2writing near2 model)	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/05 08:58
S25	494	(hand$2writing adj model)	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/05 08:58
S22	101	microphone with (locat$5 or hous$4) with stylus	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/05 08:52
S19	34	("speech-to-text") and (acoustic with language with model$5)	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/03 17:16
S20	0	("speech-to-text") and (acoustic with language with model$5) and stylus	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/03 17:16
S21	0	("speech-to-text") and (acoustic with language with model$5) and tablet	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/03 17:16
S15	0	(speech near2 to near2 text) and (acoustic with language with model$5)	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/03 17:15

EAST Search History

S16	0	(speech near2 to$1 near2 text) and (acoustic with language with model$5)	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/03 17:15
S17	417	(speech near2 text) and (acoustic with language with model$5)	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/03 17:15
S18	417	((speech near2 text) or "speech-to-text") and (acoustic with language with model$5)	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/03 17:15
S12	456	(speech near3 text) and (acoustic with language with model$5)	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/03 17:14
S13	9	(speech near3 text) and (acoustic with language with model$5 with shared)	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/03 17:14
S14	0	(speech near2 to near2 text) and (acoustic with language with model$5 with shared)	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/03 17:14
S9	38	(stylus with tablet with display) and (speech with recogni$6) and (hand$2writ$6 with recogni$6)	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/03 17:09
S10	21	S9 and model$5	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/03 17:01
S11	6	S9 and (model$5 with language)	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/03 17:01
S2	212	stylus same microphone same tablet	US-PGPUB; USPAT; JPO; DERWENT	OR	OFF	2007/11/03 16:47
S6	19	(stylus with microphone with tablet) and (user with (input$5 or writ$4)) and (speech with recogni$6) and (hand$2writ$6 with recogni$6)	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/03 16:46
S8	36	(stylus same microphone same tablet) and (user with (input$5 or writ$4)) and (speech with recogni$6) and (hand$2writ$6 with recogni$6)	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/03 16:46

EAST Search History

S7	20	(stylus with microphone with tablet) and (speech with recogni$6) and (hand$2writ$6 with recogni$6)	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/03 16:42
S5	31	(stylus with microphone with tablet) and (user with (input$5 or writ$4)) and (speech with recogni$6)	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/03 16:36
S4	109	(stylus with microphone with tablet) and (user with (input$5 or writ$4))	US-PGPUB; USPAT; JPO; DERWENT	OR	ON	2007/11/03 16:35
S1	1682	stylus and microphone and tablet	US-PGPUB; USPAT; JPO; DERWENT	OR	OFF	2007/11/03 16:34
S3	131	stylus with microphone with tablet	US-PGPUB; USPAT; JPO; DERWENT	OR	OFF	2007/11/03 16:34

OIPE IAP50 MAR 22 2006 PATENT & TRADEMARK OFFICE

DOCKET NO.: IVOR-0005 **PATENT**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:

Edwin A. Suominen **Confirmation No.: 6401**

Application No.: 11/088,032 **Group Art Unit: 2654**

Filing Date: March 22, 2005 **Examiner: Not yet assigned**

For: MESSAGE RECOGNITION USING SHARED LANGUAGE MODEL

DATE OF DEPOSIT: March 20, 2006

I HEREBY CERTIFY THAT THIS PAPER IS BEING DEPOSITED WITH THE UNITED STATES POSTAL SERVICE AS FIRST CLASS MAIL, POSTAGE PREPAID, ON THE DATE INDICATED ABOVE AND IS ADDRESSED TO THE UNITED STATES PATENT AND TRADEMARK OFFICE, P.O. BOX 1450, ALEXANDRIA, VA 22313-1450.

TYPED NAME: Grzegorz S. Plichta
REGISTRATION NO.: 55,541

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

Dear Sir:

INFORMATION DISCLOSURE STATEMENT

Pursuant to 37 CFR § 1.56 and in accordance with 37 CFR §§ 1.97-1.98, information relating to the above-identified application is hereby disclosed. Inclusion of information in this statement is not to be construed as an admission that this information is material as that term is defined in 37 CFR § 1.56(b).

☒ In accordance with § 1.97(b), since this Information Disclosure Statement is being filed either within three months of the filing date of the above-identified application, within three months of the date of entry into the national stage of

the above identified application as set forth in § 1.491, before the mailing date of a first Office Action on the merits of the above-identified application, or before the mailing date of a first Office Action after the filing of request for continued examination under § 1.114, no additional fee is required.

☐ In accordance with § 1.97(c), this Information Disclosure Statement is being filed after the period set forth in § 1.97(b) above but before the mailing date of either a Final Action under § 1.116 or a Notice of Allowance under § 1.311, or before an action that otherwise closes prosecution in the application, therefore:

- ☐ Certification in Accordance with § 1.97(e) is attached; or
- ☐ The fee of **$180.00** as set forth in § 1.17(p) is attached.

☐ In accordance with § 1.97(d), this Information Disclosure Statement is being filed after the mailing date of either a Final Action under § 1.113 or a Notice of Allowance under § 1.311 but before, or simultaneously with, the payment of the Issue Fee, therefore included are: Certification in Accordance with § 1.97(e); and the submission fee of **$180.00** as set forth in § 1.17(p).

☒ Copies of reference numbers 53, 54, and 67-104 listed on the attached Form PTO-1449 are enclosed herewith.

☒ Copies of reference numbers 105 and 106 are currently unavailable to the Applicant, however copies will be submitted as soon as they are supplied.

☐ Copies of reference numbers - on the attached Form PTO 1449 are not required to be submitted pursuant to 37 CFR § 1.98(a)(2)(i).

☒ Copies of references 1-52 and 55-66 are not being submitted because they were previously cited by or submitted to the U.S. Patent and Trademark Office in patent application number 10/061,052, filed January 28, 2002, for which a

claim for priority under 35 U.S.C. § 120 has been made in the instant application.

Please charge any deficiency or credit any overpayment to Deposit Account No. 23-3050. This form is submitted in duplicate.

Date: March 20, 2006

Grzegorz S. Plichta
Registration No. 55,541

WOODCOCK WASHBURN LLP
One Liberty Place - 46th Floor
Philadelphia, PA 19103
Telephone: (215) 568-3100
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Form PTO-1449 Modified List of Patent and Publications Cited by Applicant (Use several sheets if necessary) U.S. Department of Commerce Patent and Trademark Office	Docket No. IVOR-0005	Application No. 11/088,032
	Applicant Edwin A. Suominen	
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	Confirmation No. 6401	

U. S. PATENT DOCUMENTS

Examiner Initial		Document No.	Date	Name	Class	Subclass
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	3	5,150,424	09/22/92	Aguro et al.	382	13
	4	5,349,139	09/20/94	Verrier et al.	178	19
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	Applicant Edwin A. Suominen	
	Filing Date March 22, 2005	Group 2654
	Confirmation No. 6401	

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(71) Applicant *(for all designated States except US)*: COUNTING TECHNOLOGY LIMITED [GB/GB]; 25 Carlisle Avenue, St. Albans, Herts AL2 5LX (GB).

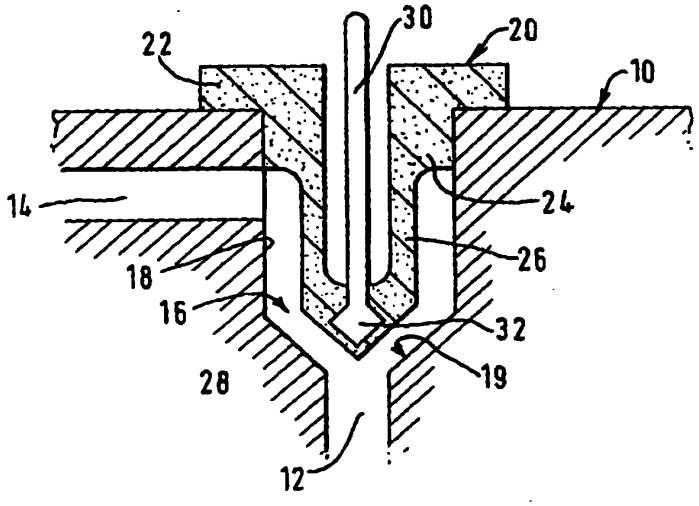
(72) Inventor; and
(75) Inventor/Applicant *(for US only)*: GILBERT, Ian, David [GB/GB]; 25 Carlisle Avenue, St. Albans, Herts AL2 5LX (GB).

(74) Agent: HALE, Peter; Kilburn & Strode, 30 John Street, London WC1N 2DD (GB).

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(54) Title: DIAPHRAGM VALVE



(57) Abstract

A fluid valve assembly has a valve body (10, 50) which defines a valve chamber (16, 48) and has inlet and outlet ports (12, 14, 38, 46). A resilient valve member (20, 40) lies within the valve chamber. In one embodiment, the member has a conical end section (28) which may be stretched to fit into a correspondingly tapered valve seat (19). In an alternative embodiment, the member (40) may also define one of the ports (38) and can be bent against a valve seat (53) to stop fluid flow. Either embodiment may, alternatively, be biased closed, deformation of the member then opening the valve. The invention minimises the amount of dead space in the valve, thus reducing reading errors due to retention of fluid in this space. Compared with pinch valves, actuation force is also reduced.

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DIAPHRAGM VALVE

This invention relates to a fluid valve assembly. The invention is particularly, though not exclusively, applicable to a fluid valve assembly for chemical or biological analysis apparatus.

The control of fluid flow is commonly effected by the use of valves. For example, in instruments for chemical or biological analysis, such as a Coulter Aperture based particle counter, it is often necessary to control the flow of very small volumes of fluid very accurately if the analysis is to be sufficiently accurate.

Such control is not well served by conventional forms of valves. Various considerations may have to be taken into account.

Firstly, the low volume, or dead space, within the valve may be the source of a reading error. The dead space in a valve may retain a significant amount of fluid when it is shut which could later be introduced into the subsequent flow of the fluid, contaminating it. It is also necessary to be able to clean thoroughly such instruments in order to flush out as much of the fluid from a previous analysis as possible. Again, the valve may harbour pockets of the fluid which it is not easy to remove by flushing. This contamination of one sample by a previous one is commonly called carryover.

Secondly, the valve may have a displacing effect on the flow of fluid as it is actuated. This may also have a distorting effect on an analysis by the 'pumping action' which may result.

Diaphragm valves are known. However, they suffer from poor carryover as the diaphragm, being relatively large, allows the fluid to slow down as it flows through the valve in an unpredictable manner. Small viscosity and temperature changes alter the flow pattern.

Pinch valves operate by clamping on a tube to control the flow of fluid. These pinch valves, comprising a flexible tube and a clamp, have substantially zero carryover, but do suffer from other problems. It is found that they tend to stick shut when the clamping is removed after being maintained in a clamping position for a significant length of time. It is possible to reduce this by making the valves normally open so that in any extended period during which the apparatus is standing idle, the tube is not closed. However, using a normally open valve is not convenient in many instrument designs. It has also been proposed to use a pinch valve in which the tubing wall is both clamped and pulled apart to overcome the sticking problem.

Ideally any valve arrangement should substantially maintain the fluid velocity of the connecting tubes, so that the fluid is not allowed to slow down significantly nor get trapped in corners as it flows through the valve.

The fluid displacement problem associated with valves can be illustrated in relation to pinch valves. As the pinch valve is closed it changes the volume of the conduit with which it is associated. In the chemical/biological analysis field this reduction in volume may be around 15 microlitres for a small tube and depends on the tube diameter. A similar change in volume will be experienced when the valve is opened. This may be a sufficient amount to affect results significantly. Diaphragm valves suffer from a tendency to 'pump' fluid by changing volume as they are opened and closed, but by a larger amount depending on the diameter of the flexible member.

According to the present invention there is provided a fluid valve assembly comprising: a valve body at least partially defining a valve chamber, a valve seat therein and inlet and outlet ports communicating with the valve chamber upstream and downstream of the valve seat; and a valve member arranged sealingly to engage with the valve seat; wherein the valve member is mounted relative to the valve body on a resilient support which allows the valve member to move between valve seat engaging and disengaging positions.

In one form of the invention the resilient support has a relatively thin portion which provides a region less resistant to a distorting force which generally defines the manner in which the support will yield to a force applied. Preferably, the resilient support also defines the valve member which may comprise a valve plug for sealing against the valve seat surrounding an aperture in the valve chamber.

The valve member may be located within the part of the chamber defined by the valve body or the valve member may be located within the part of the chamber defined by the support.

The assembly may include a valve actuator extending into a recess in the support to engage the valve member, the actuator being movable to urge the valve member between the engaging and disengaging positions against the resilient force of the support. The actuator may be formed with a reinforcing head which is received in the region of the valve member which engages the valve seat.

Preferably, the valve member is moulded as a unitary structure which is arranged to project into a recess partially defining the valve chamber, which structure closes the chamber.

The valve seat may be formed on a hollow projection extending into the valve chamber, the projection being connected with one of the ports. In this case, the valve seat surrounds an aperture in the hollow projection either as a chamfered end face thereof are formed in the side wall, which valve seat is arranged to engage a generally complementarily orientated sealing valve member surface on the wall of the chamber defined by the support.

The resilient support for the valve member may be arranged so that the valve assembly is normally open or normally closed in the least stressed condition of the resilient support.

In a chemical/biological analyser application the internal diameter of the tubing associated with the valve assembly is typically 1.5mm. The travel of the valve member in relation to the valve seat is very small, of the order of 0.75mm. The invention has a reduced pumping action or tendency to displace fluid when it is actuated. This arises from the diameter of the sealing part of the valve member which is only slightly larger, preferably no more than 25%, than the diameter of the valve seat.

Pumping is calculated from the resilient member diameter and its travel. The resilient port only has to be slightly larger than the inlet pipe diameter to seal properly. 10% is reasonable minimum.

$$\text{Pumping volume} = \frac{\pi}{4} (\text{seat dia} + \ )^2 \times \text{travel}$$

For: seat of 1.5mm + 25% for resilient member x 0.75 travel

$$\text{Pumping} = \frac{\pi}{4} [1.5 + 0.25(1.5)]^2 \times 0.75 = 2.07 \text{ mm}^3$$

For: seat of 1.5 + 50% x .75 travel

Pumping = 2.98

While this latter figure is more, it is still less than equivalent pinch valves.

The assembly according to the invention also requires a smaller actuation force than an equivalent pinch valve which requires compression of the tubing itself or a diaphragm arrangement which comprises a larger flexible member that must be actuated against the force derived from the fluid pressure acting on the relatively considerable diaphragm area. The support does not have a large distance to shut off over, nor does it have an excessive area over which the fluid pressure in the valve is exerted.

The present invention can be put into practice in various ways some of which will now be described by way of example with reference to the accompanying drawings in which :-

Figure 1 is a sectional view of a first valve assembly according to the invention;

Figure 2 is a sectional view of a second valve assembly according to the invention; and

Figure 3 is a sectional view of a third valve assembly according to the invention.

Referring to Figure 1, a valve assembly comprises a valve body 10 which is a junction between tubes (not shown) in a chemical or biological analysis instrument. The tubes are respectively connected to inlet and outlet ports 12 and 14 formed in the body 10.

The valve body 10 also defines the valve chamber 16 by which the inner and outlet ports communicate. The chamber 16 comprises a circular recess 18 in the valve body 10 which is co-axial with the inlet port 12. The

valve seat 19 is formed as a tapered portion of the recess which merges the circular recess 18 with the inlet port 12. The outlet port 14 extends perpendicularly and radially with respect to the axis of the recess 18 and is let into the side wall of the body 10 defining the circular recess 18. The circular recess 18 is open at its end opposite the inlet port 12.

A resilient valve member 20 projects into the recess 18 from its open end. The member 20 comprises a recess-engaging portion having a circular flange 22 projecting radially from a circular sleeve 24. The sleeve 24 is of substantially the same diameter as the circular recess 18 into which it is inserted to hold the valve member 20 in position. The extent of projection of the valve member 20 into the recess is determined by the flange 22 engaging the external surface of the valve body 10.

A co-axially projecting circular section hollow stalk 26 projects further into the recess 18 from the sleeve 24. The end of the stalk 26 is formed of the solid, i.e., non-hollow, valve seat engaging portion 28 of the same resilient material.

The thickness of the wall of the hollow stalk is less than the thickness in the region of the sleeve 24 and the flange 22.

The outer surface of the end of the valve seat engaging portion 28 is in the shape of a cone. The included angle of the cone shape is substantially the same as

the degree of taper of the valve seat 19 between the circular recess 18 and the inlet port 12. The cone 28 is spaced from the valve seat 19 by a distance sufficient to allow substantially unimpeded passage of the fluid between the inlet and outlet ports. It will be noted that the outside diameter of the stalk is in the region of 60% of the diameter of the circular section recess 18.

A rigid actuating push rod 30 is received in the conical valve seat engaging portion 28 of the valve member 20. The rod 30 extends along the hollow centre of the stalk 26 to project beyond the axial extent of the flange 22. The end of the rod 30 is formed with a circular section head which has a conical surface nearest the valve seat with a similar degree of taper. The head 32 provides a reinforcement for the resilient valve member 20 in the region of its engagement with the valve seat 19. The included angle of the conical shape head 32 on the push rod 30 is the same as that on the valve seat engaging portion 28.

The spacing of the valve member from the walls defining the recess is chosen to create minimal fluid disturbance in the transition from the inlet port to the outlet port. Where possible the corners in the valve chamber are radiused instead of being sharp in order to avoid providing spaces in which fluid residue could collect and from which it will be difficult to flush.

By depressing the push rod 30 the stalk 26 yields and is stretched, moving the conical valve seat engaging portion 28 towards the valve seat portion 18, restricting the flow between the ports 12 and 14. The resilient material of the conical valve seat engaging portion 28 engages the valve seat portion 18 to effect a seal when the push rod 30 is sufficiently depressed. Removing the depressing force from the push rod 30 allows the resilient stalk 26 to retract away from the valve seat portion 18.

The valve assembly is normally open due to the resilience of the stalk. However, it will be appreciated that it could equally well be arranged to be normally closed.

Figure 2 illustrates a second embodiment of the invention. An inlet port 38 is connected to one end of a rigid tube 40 which has an obliquely cut or chamfered free end constituting a valve seat 42, projecting from a main valve body 44. An outlet port 46 is formed in the valve body 44 which extends perpendicularly to the tube 40. The inlet and outlet ports communicate with a valve chamber 48 partially defined in the valve body 44 and enclosed by a hollow resilient stalk 50 which has a closed end, closing the valve chamber. The tube 40 extends inside the chamber 48 defined between the stalk 50 and the valve body 44. The inner surface 53 of the stalk adjacent the valve seat 42 is arranged at a slightly more steeply inclined attitude than the chamfered end of the tube 40, constituting the valve seat 42.

The stalk 50 has an external flange 52 at its base and an annular projecting lip '54. The lip 54 is of the same external diameter as the diameter of the circular recess of the valve body 44. The stalk 50 is clamped in place by means of clamps 56 bearing on the flange 52 to hold it against the valve body 44. The wall thickness of the stalk is least between the closed end and the flange 52.

The valve is actuated by pressing on the stalk 50 in the region of the thicker end portion opposite the inclined surface 53 to regulate the flow from the inlet port 38 through the tube 40. The stalk 50 yields in the thinnest wall region and bends until the attitude of the inclined surface 53 is substantially the same as that of the valve seat 42 when the two are brought into sealingly engagement. Again, this valve assembly could equally well be arranged to be normally closed instead of the illustrated normally open arrangement.

In an alternative form of this embodiment the chamfered end face of the tube 40 could be simply closed and the aperture around which the valve seat would be defined could be formed in a side wall of the tube or even in the closing end of the tube. Clearly the resilient stalk 50 would need to be shaped to complement this change in the position of the valve seat as necessary.

Figure 3 is a modification of the valve in Figure 1 in which like parts have like numerals. The outlet port 14' is parallel to the inlet port 12. To accommodate this the cross-section of the recess is oval although it could be maintained circular but of a larger

diameter. In this regard the resilient stalk is formed with an oval sleeve 24', if necessary, by which it is held in position in the recess 18'.

Suitable materials for the resilient stalk include elastomers chosen for low working fluid contamination and chemical resistance. Silicon rubbers, polyurethane, viton, butyl, natural rubber, kalrez (PTFE rubber) or any other such material will be suitable. The material should not be too hard to prevent the thin walls stretching, nor to soft that the system pressure distorts the entire insert or its thin wall during operation at intended fluid pressures. As the valve assembly is suitable for a wide range of applications, material choice will be tied to the conditions of use.

CLAIMS:

1. A fluid valve assembly comprising a valve body at least partially defining a valve chamber, a valve seat therein and inlet and outlet ports communicating with said valve chamber upstream and downstream of said valve seat; and a valve member arranged sealingly to engage with said valve seat; wherein said valve member is mounted relative to said valve body on a resilient support which allows said valve member to move between valve seat engaging and disengaging positions.

2. An assembly as claimed in Claim 1, wherein said valve member is adapted to yield to a force applied.

3. An assembly as claimed in Claim 2, in which the resilient support also defines the valve member, which member includes a valve plug for sealing against said valve seat in response to an applied force.

4. An assembly as claimed in Claim 1, wherein said resilient support has a relatively thin portion providing a region less resistant to an applied force.

5. An assembly as claimed in Claim 1, wherein the force may be applied by means of a valve actuator extending into a recess in the resilient support.

6. An assembly as claimed in Claim 3, wherein the resilient support is a unitary structure which is arranged to project into a recess partially defining said valve chamber, which structure completes said chamber.

7. An assembly as claimed in Claim 1, wherein said valve seat is formed on a hollow projection extending into said valve chamber, said projection constituting one of the said ports.

8. An assembly as claimed in Claim 3, wherein said valve plug has a conical portion arranged to cooperate with said valve seat.

9. An assembly as claimed in Claim 8, wherein the included angle of the said conical portion is substantially the same as that of the said valve seat.

10. An assembly as claimed in Claim 3, wherein the said valve seat has a first inclined portion arranged to cooperate with a second inclined portion of the said valve plug.

11. An assembly as claimed in Claim 10, wherein the inclination of the said first inclined portion is steeper than the inclination of the said second inclined portion.

12. An assembly as claimed in Claim 2, wherein the said valve assembly is normally open when in a least stressed condition of the said resilient support.

13. An assembly as claimed in Claim 2, wherein the said valve assembly is normally closed when in a least stressed condition of the said resilient support.

14. An assembly as claimed in Claim 1, wherein the corners and edges in the said valve chamber are radiused.

FIG. 1.

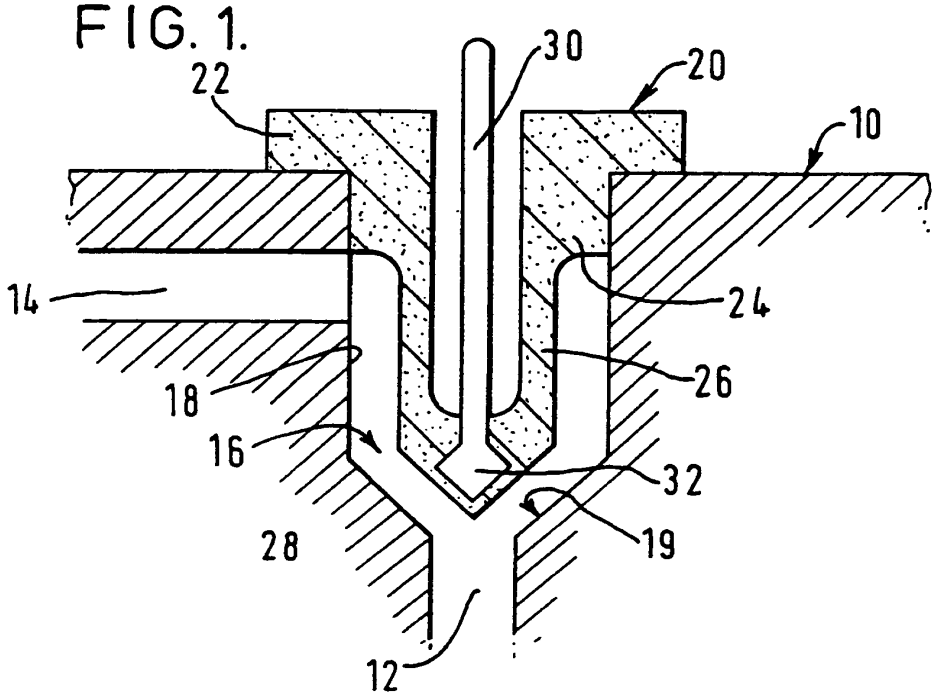

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FIG. 2.

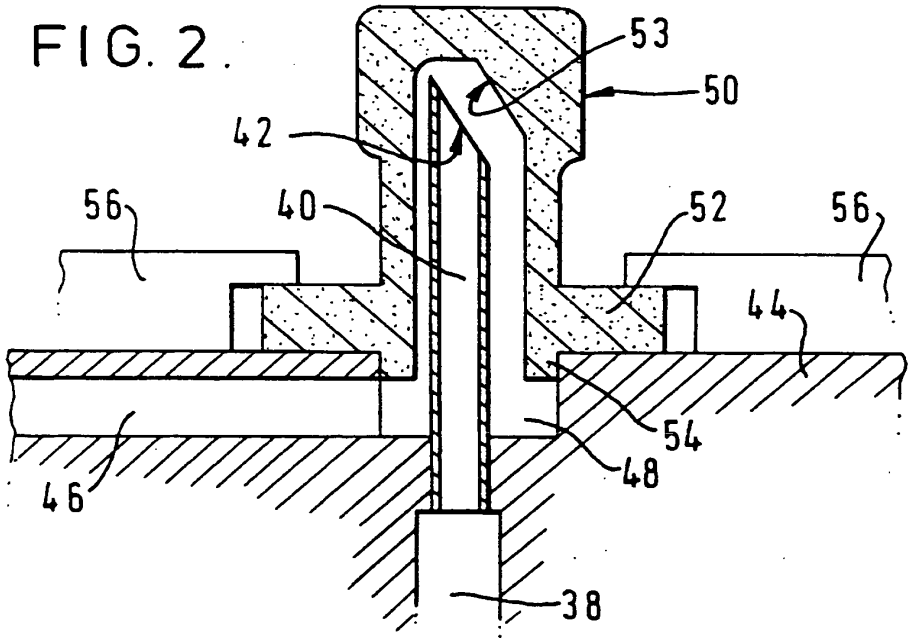
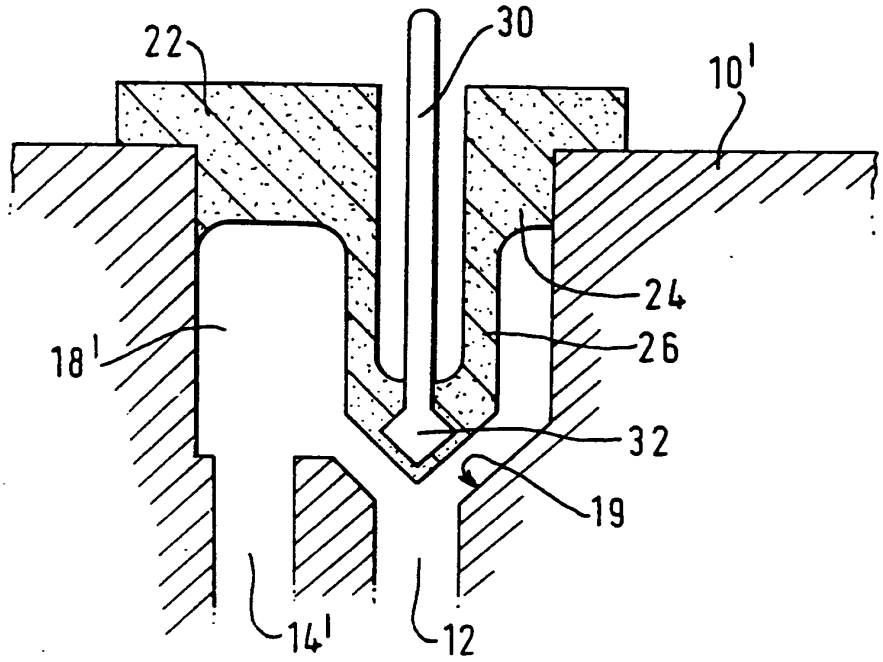

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FIG. 3.



INTERNATIONAL SEARCH REPORT

Intern al Application No
PCT/GB 95/00549

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 F16K41/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 F16K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE,A,24 21 844 (DR. ERNST BÜCHE K.G.) 8 April 1976 see page 5 - page 7; figures	1-6,8,9, 12,14
A	US,A,4 527 588 (TSEO) 9 July 1985 see abstract; figures 3,4	1-3,7
A	WO,A,94 01750 (NL TECHNOLOGIES, LTD.) 20 January 1994 see abstract	1
A	GB,A,1 040 947 (TOMLINSON INDUSTRIES) 1 September 1966	

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

1

Date of the actual completion of the international search	Date of mailing of the international search report
27 June 1995	06. 07. 95
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax (+31-70) 340-3016	Authorized officer Christensen, J

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INTERNATIONAL SEARCH REPORT

Information on patent family members

Intern al Application No
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Patent document cited in search report	Publication date	Patent family member(s)		Publication date
DE-A-2421844	08-04-76	NONE		
US-A-4527588	09-07-85	AU-B-	561519	07-05-87
		AU-A-	3353484	20-06-85
		EP-A-	0154084	11-09-85
		JP-A-	60129480	10-07-85
WO-A-9401750	20-01-94	US-A-	5296197	22-03-94
		CA-A-	2139740	20-01-94
		EP-A-	0649521	26-04-95
GB-A-1040947		NONE		

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(71) Applicant: **International Business Machines Corporation**
Old Orchard Road
Armonk, N.Y. 10504 (US)

(72) Inventor: **Stein, Frank L.**
1717 Larkmeade Drive
Vienna, VA 22182 (US)

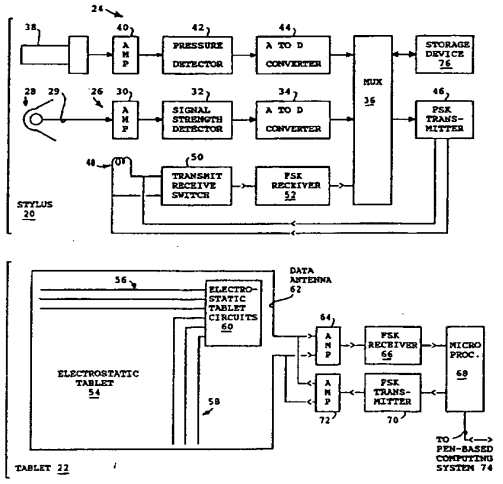
Inventor: **Verrier, Guy F.**
54 S.W. 13th Avenue
Boca Raton, FL 33486 (US)
Inventor: **Donaldson, Robert L.**
609 Monerey
Annapolis, MD 21401 (US)
Inventor: **Schubert, Karl D.**
17032 Flatwood Drive
Rockville, MD 20855-2538 (US)

(74) Representative: **Schäfer, Wolfgang, Dipl.-Ing.**
IBM Deutschland Informationssysteme GmbH
Patentwesen und Urheberrecht
D-70548 Stuttgart (DE)

(54) Voice communication features in an untethered personal stylus for a digitizing display.

(57) An improved voice communication feature is disclosed for an untethered personal stylus used with a digitizing display in a pen-based computer system. A microphone and speaker are included in an untethered stylus in conjunction with a mechanical contact and radiative pickup mechanisms, to enable multimedia communication between the user and the pen-based computer system, through a digitizing display.

FIG. 1



EP 0 622 724 A2

Background of the Invention

1. Technical Field

The invention disclosed broadly relates to data processing systems and more particularly relates to improvements in input/output devices for pen-based computer systems.

2. Related Patents and Patent Applications

The following patents and patent applications are assigned to the IBM Corporation and are incorporated herein by reference.

USP 4,686,332 entitled "Combined Finger Touch and Stylus Detection System for Use on the Viewing Surface on a Visual Display Device," by Evon C. Greanias, et al.

USP 5,007,085 entitled "Remotely Sensed Personal Stylus," by Evon C. Greanias, et al.

USP 5,117,071 entitled "Stylus Sensing System," by Evon C. Greanias, et al.

Copending U. S. patent application serial number 07/778,431, filed October 16, 1991 entitled "Touch Overlay for Improved Touch Sensitivity," by Evon C. Greanias, et al.

Copending U. S. patent application serial number 07/351,227, filed May 15, 1989 entitled "Flat Touch Screen Workpad for a Data Processing System," by Gordon W. Arbeitman, et al.

Copending U. S. patent application serial number 07/969,864 filed, October 30, 1992 entitled "Architecture for Communication of Remote Devices to a Digitizing Display" by Guy F. Verrier, et al.

3. Background Art

Pen-based computer systems have been described in the prior art, for example in the above referenced USP 4,686,332 by Greanias, et al. In that system, a touch overlay membrane is positioned over the viewing surface of a display device such as a computer monitor, for interacting with a pickup stylus. The pickup stylus described in the '332 patent is connected by means of a wire to the pen-based computer system. The pen-based computer system generates a radiative signal in the touch overlay. The radiative signal is picked up by the stylus and sent back over the wire to the pen-based computer. The computer then calculates the relative X-Y position of the stylus with respect to the overlay. The relative proximity Z of the stylus to the overlay is determined by the signal amplitude picked up by the stylus from the electromagnetic energy radiated from the overlay. An improvement in the stylus pickup antenna is described in the above cited USP 5,117,071 by Greanias, et l. In the '071 patent, the antenna configuration in the tip of the stylus is a small sphere, whose shape enables a uniform signal strength to be picked up without regard for the relative orientation of the stylus with respect to the planar surface of the overlay. A further improvement has been made to the stylus by eliminating the cable connection between the stylus and the pen-based computer system, as is described in USP 5,007,085 by Greanias, et al. In the '085 patent, the signal detected by the stylus antenna which has been picked up from the electromagnetic radiation emitted by the overlay, is converted into a second signal which is transmitted either by infrared radiation, microwave radiation or radio frequency radiation at a different frequency, from the stylus back to an electromagnetic detector coupled to the pen-based computer system. Another improvement to pen-based computer systems is described in the above referenced copending U. S. patent application serial number 07/351,227, filed May 15, 1989 by Arbeitman, et al. In the Arbeitman, et al. patent application, a flat touch screen workpad is substituted for the combination of the computer display monitor and touch overlay membrane. In the Arbeitman, et al. patent application, the radiative pickup stylus is connected by means of a wire to the flat touch screen workpad, for receiving the electromagnetic radiation emanated from the overlay membrane, the wire transferring the detected signal from the pickup stylus back to the electronics containedin the flat touch screen workpad.

In the description of the invention contained herein, the term "digitizing display" will be used to generally refer to either the combination of a computer display monitor and touch overlay membrane described in the '085 patent or alternately, the workpad display and overlay described in the Arbeitman, et al. patent application.

The above cited USP 5,007,085 entitled "Remotely Sensed Personal Stylus," by Evon C. Greanias, et al., describes a pen-based computer system which has a digitizing display which radiates electromagnetic signals which are picked up by a remotely sensing personal stylus. The antenna in the tip of the stylus picks up the electromagnetic signals radiated from the display overlay, and converts those signals into a suitable form for retransmission back to the pen-based computer system. The relative signal strength of the signals picked up by the stylus is used to infer the relative separation distance Z of the tip of the stylus with respect to the overlay. The converted signals are transmitted back to the pen-based computer system by means of a transmitting circuit and transmitting antenna within the stylus. The technique for determining contact between the stylus tip and the

surface of the overlay, is by measuring the relative signal strength of the electromagnetic signal picked up by the tip of the stylus.

A problem with this prior art is that the detection of actual touchdown of the stylus onto the workpad surface is not very sensitive. Consider in normal handwriting how the writer's hand pressure varies during the course of writing a signature. The pressure applied by the pen to the paper varies over the course of inscribing the signature on the paper and sometimes includes a slight raising of the pen from the surface of the paper. The process of writing a signature on a digitizing display by means of a radiative pickup stylus, does not faithfully reproduce the intended shape on the display screen. When the stylus is raised slightly from the surface of the digitizing display, the separation of the stylus tip from the surface will not be detected in prior art systems. What results is spurious traces and artifacts which remain in the "inked" depiction of the user's signature because the system cannot detect the actual small separation of the stylus from the surface of the digitizing display. This problem has been addressed and solved by the above cited copending patent application by Guy F. Verrier, et al. serial number 07/969,864.

Another problem with the prior art is the applications of multimedia communications to a personal untethered stylus for a digitizing display. Typically, multimedia applications include the transmission and reception of voice and other auditory communications with the user. If the user is using a digitizing display and untethered stylus, there is no provision in the prior art for accommodating voice communications at the user location.

Objects of the Invention

It is therefore an object of the invention to provide an improved voice communications feature for an untethered personal stylus for a digitizing display.

It is another an object of the invention to reduce acoustic noise pickup by a microphone in an untethered stylus when it mechanically contacts a digitizing display in a pen-based computer system.

It is another object of the invention to provide a LAN-based acoustic communication device in a stylus for a digitizing display in a pen-based computer system.

It is a further object of the invention to provide an improved means for transferring multimedia information between a stylus and a pen-based computer system.

It is yet another object of the invention to provide a data processing system and method for communicating multimedia information between a stylus and a pen-based computer system.

Summary of the Invention

These and other objects, features and advantages are accomplished by the architecture for communications of remote devices in a two-way digitizing display. In accordance with the invention, a stylus in a pen-based computer system includes a contact detection mechanism such as a pressure transducer which is connected through to an analog-to-digital converter to a multiplexer inside the stylus. Also connected to the multiplexer is a position detector such as a radiative pickup mechanism and signal strength detector, which provides second analog-to-digital converted bit stream to the multiplexer. The multiplexed signal which includes information relating to stylus contact and to stylus position, is then passed through a transmitter and transmitted by electromagnetic radiation to a nearby digitizing display.

In accordance with the invention, a multimedia stylus is provide for a digitising display, which can accommodate voice communications. A multiplexer included in the stylus, has inputs for microphone connection and outputs for speaker connections in the stylus. The microphone can be coupled through a switching mechanism to an input of the multiplexer, for converting input audio signals to an audio message to be transmitted to the digitizing display or to the pen-based computer system. A speaker in the stylus is coupled to an output of the multiplexer, for receiving signals transmitted from the digitizing display or from the pen-based computer system, for producing output audio signals containing an audio message.

The pen-based data processing system can send to the receiver in the stylus, signals to control the switching mechanism connecting the microphone to the transmitter in the stylus. In this manner, the microphone can be selectively coupled to the transmitter in the stylus in response to position indicating signals received by either the contact detection mechanism or alternately the radiative pickup mechanism in the stylus.

The pen-based data processing system can send signals to the receiver in the stylus representing audio messages, in response to contact detection signals or radiative pickup signals collected by the stylus when in proximity to the digitizing display. In this manner, the speaker in the stylus can produce output audio signals of audio messages which are responsive to the position detection information gathered by the stylus from either the contact detection mechanism or the radiative pickup mechanism therein. The microphone in the stylus can be selectively disconnected from the transmitter in the stylus in response to the contact

detection mechanism or the radiative pickup mechanism determining that the stylus tip is in contact with the digitizing display. In this manner, acoustical noise produced by the mechanical engagement of the stylus tip with the digitizing display, need not be transmitted from the microphone to the pen-based computer system. This function can be performed either directly from the contact detection mechanism or the radiative pickup mechanism or alternately it can be performed by remote control employing signals transmitted from the pen-based computer system to the receiver in the stylus.

In one embodiment, the microphone analog output is converted into a digital output for transmission to the pen-based computer system. In another embodiment, the analog signal from the microphone can be directly transmitted back to the pen-based computer system using amplitude modulation, frequency modulation or the modulation of infrared radiation from the stylus to the pen-based computer system.

The digitizing display can be for example, a transparent overlay on a computer display monitor or a workpad, which includes an array of radiating wires embedded therein. The pattern of signals emitted by the radiating wires will be picked up by the stylus and used to infer the relative position of the stylus over the area of the overlay. In accordance with the invention, the multiplexed signal containing information about the contact of the stylus and also about the X-Y position of the stylus, is transmitted from the stylus to an antenna embedded in the digitizing display. The signal is decoded by electronics in the digitizing display, and is forwarded to the pen-based computer system. In accordance with the invention, the receiving antenna is embedded in the digitizing display and is suitable for the receipt of the multiplexed signal transmitted from the stylus.

Further in accordance with the invention, an electromagnetic signal receiver is included in the stylus capable of receiving electromagnetic signals transmitted from the antenna embedded in the digitizing display. In this manner, information originating in the pen-based computer system can be transmitted from the digitizing display through the embedded antenna to the receiver in the stylus for utilization therein.

Description of the Drawings

These and other objects, features and advantages will be more fully appreciated with reference to the accompanying figures.

Fig. 1 is an overall architectural diagram of the invention.

Fig. 1B is an architectural diagram of the pen-based computer system, showing the relationship between the personal computer 74, the tablet 22 and the stylus 20.

Fig. 2 is a mechanical side view of an example stylus which includes the voice communications features such asthe microphone 16 and the speaker 17.

Fig. 3A is a schematic block diagram of a first embodiment of the invention.

Fig. 3B is a schematic block diagram of a second embodiment of the invention.

Fig. 3C is a logic block diagram of the microphone switch 19 shown in Fig. 3B.

Fig. 4A is a waveform diagram of the input and output to the multiplexer 36' in association with the embodiment of Fig. 3A.

Fig. 4B is a waveform diagram of the input and output from the multiplexer 36' in association with the second embodiment shown in Fig. 3B.

Fig. 5 is a top view and

Fig. 6 is a side view of the workpad 22.

Fig. 7 is a flow diagram of a sequence of operational steps carried out in the pen-based computer system 74 as an example of the control for the stylus voice feature.

Discussion of the Preferred Embodiment

Fig. 1 is an overall architectural diagram of the architecture for communications of remote devices to a digitizing display. The digitizing display which is described herein is described in greater detail in the commonly assigned USP 5,007,085 by Greanias entitled "Remotely Sensed Personal Stylus" and USP 4,764,885 by Greanias entitled "Proximity Sensing Blinking Cursor Feature and USP 4,686,332 by Greanias entitled "Thin Plastic Overlay for Finger and Stylus Display Input."

Fig. 1B shows the pen-based computer system that includes the personal computer 74, the digitizing display or workpad tablet 22 and the stylus 20. The personal computer 74 includes a memory coupled by a system bus to a central processing unit (CPU), a keyboard, a display monitor, a disk drive bulk storage, a local area network (LAN) adapter and the tablet 22. The memory of the personal computer 74 stores an operating system program, device driver programs and application programs which are sequences of executable instructions that are executed in the CPU. The LAN adapter of the personal computer 74 connects to a local area network (LAN) that can connect the

personal computer 74 to other computers and other networks. The stylus 20 communicates with the tablet 22 by means of an electromagnetic link that can be frequency modulated radio signals, amplitude modulated radio, or modulated optical or infrared radiation signals.

The architecture shown in Fig. 1 is divided in two principal parts. The first part is the stylus 20 and the second part is the digitizing display 22. The stylus 20 includes a first branch which can be for example branch 24 which is a mechanical contact detecting branch. The second branch can be for example branch 26 which is a position detecting branch.

The contact detecting branch 24 can include a pressure detector 38, which is shown in greater detail in Fig. 2. Connected to the pressure detector 38 is a signal amplifier 40 which has its output connected to the pressure detector circuitry 42. The output of pressure detector circuitry 42 goes to the analog-to-digital converter 44 which outputs a digital number representing the pressure applied by the pressure detecting mechanism 38 to the front surface of the electrostatic tablet 54 in Fig. 1. The output of the analog-to-digital converter 44 is then applied to a first input of the multiplexer 36.

Fig. 2 shows the stylus 20 and in particular, shows the details of the mechanical contacting mechanism 38. A pressure transducer 10 includes a layer formed of a force sensitive resistant (FSR) transducer material, for example, as manufactured by Interlink Electronics, Santa Barbara, California. Such material changes its resistance when compressed by the application of a force on its surface. Electrically conductive electrodes on the printed circuit board 11 contact separated portions of the surface of the FSR transducer layer 10 such that a complete circuit is formed between the conductors on the printed circuit board 11, by way of the FSR transducer layer 10. The electrodes on the printed circuit board 11 are pressed against the transducer 10 to complete the electrical circuit.

When the operational amplifier 40 shown in Fig. 1 is turned on but the stylus 20 is not yet in use, a voltage will be applied across the FSR transducer 10 by way of the stylus terminals and conductive electrodes 11. Then, when the tip 4 of the stylus 20 is pressed against the tablet surface 54, the FSR transducer layer 10 is compressed between the surfaces of two opposing parts. The first part is displaceable as the stylus tip 4, which is slightly displaced when pressure is exerted on the stylus tip 4. The other part of the compression mechanism is stationary and is the printed circuit board 11 which is held in place by the housing 2 shown in Fig. 2. When the FSR transducer layer 10 is compressed, its electrical resistance changes such that a current and/or voltage change is produced at the output connected to the operational amplifier 40. This change is used to trigger the pressure detector 42, to acquire the pressure sensing data. Also included within the hollow tip 4 of the stylus 20 of Fig. 2, is the pickup antenna 29 shown in Fig. 1, which is radiatively coupled to the radiating electrodes 56 and 58 of the tablet 54.

In the position detecting branch 26 is the antenna device 29 described in USP 5,117,071 cited above, which picks up electromagnetic signals radiated from the conductors 56 and 58in the electrostatic tablet 54. The output of the antenna 29 is coupled through the amplifier 30 to the signal strength detector 32. The output of the signal strength detector 32 is then applied to the analog-to-digital converter 34. The output to the analog-to-digital converter 34 is a digital representation of the signal strength detected by the antenna 29 for the signals radiated from the conductors 56 and 58 in the electrostatic tablet 54. The signals radiated from the electrostatic tablet 54 represent positional information when detected by the antenna 29, as described in USP 5,686,332, cited above.

The output of the signal strength detector 32 is applied to the analog-digital converter 34, which in turn outputs a digital representation of the relative position of the stylus 20 over the electrostatic tablet 54, as a number to a second input to the multiplexer 36.

The multiplexer 36 is shown as multiplexer 36' in another schematic diagram in Fig. 3A. There it is seen that the multiplexer 36 or 36' generates a time-divided sequence of numbers in data frames as shown in Fig. 4A, which are applied to the transmitter 46. The multiplexer can be controlled to change the order and content of the data stream. Returning back to Fig. 1, the multiplexed data stream of numbers alternately output from the pressure detector A-to-D converter 44 and the position detecting A-to-D converter 34 are applied to the frequency shift key (FSK) transmitter 46. The output of the transmitter 46 is then applied to the antenna 48 in the stylus 20. The stylus 20 then radiates the information which includes the applied pressure on the pressure detecting mechanism 38 and the X-Y position information from the antenna device 29. This data stream is radiated from the antenna 48 and is detected, in accordance with the invention, by the embedded antenna 62 in the digitizing display 22.

Fig. 3A shows the multiplexer 36' including the inputs A, B, C, D, E and the output F, which can replace the multiplexer 36 in Fig. 1. The multiplexer 36' in Fig. 3A has five input devices connected to it, the pressure detector 42, the signal strength detector 32, the personal identification number storage 104, the RAM 106 and the microphone 16 and speaker 17 through the CODEC 13.

The pressure detector 42 transfers the applied pressure signal input from the tip 4 of stylus 20 to the analog-to-digital converter 44, which outputs a digital representation of the applied pressure on input A to the multiplexer 36'. The signal strength detector 32 receives X-Y related position information and Z separation information from the antenna 29 and applies it to the analog-to-digital converter 34. The converter 34 outputs a digital representation of the X-Y position and Z separation over the input B to the multiplexer 36'. The personal identification number storage 104 can be a read-only storage or a writable EPROM which outputs an identifying digital number on the input C to the multiplexer 36'. The RAM 106 can store information which is output as digital information to the input D to the multiplexer 36'.

Fig 3A also shows the microphone 16 and speaker 17 connected through the CODEC 13 to the multiplexer 36'. The CODEC 13 can be the pulse code modulation or delta modulation type encoder and decoder which converts analog signals such as voice signals into a sampled and digitized stream of binary bits. Examples of in the prior art of suitable CODEC 13 is shown in USP 4,208,740 to H. B. Yin, et al. entitled "Adaptive Delta Modulation System," assigned to the IBM Corporation and incorporated herein by reference. Other suitable CODEC devices are described for example in USP 4,059,800 by Gardner Jones, Jr., entitled "Digital Multi-Line Companded Delta Modulator," assigned to the IBM Corporation and incorporated herein by referenced. The CODEC 13 will sample the analog signal from the microphone 16 and digitize the samples into a digitized stream of binary information which is a digitized replica of the original analog signal, and output over line E. It can be pulse code modulated or delta modulated. Correspondingly, digitized voice information can be received over line E from the multiplexer 36' by the CODEC 13 and converted into an analog waveform representing the original speech message. The resulting analog signal is transferred from the CODEC to the speaker 17 for presentation as an audio signal.

Fig. 2 shows that the end 18 opposite to the end 38 of the stylus 20, has perforations therethrough to allow the sound of the user's voice to pass unimpeded to the microphone 16 and the audio signal from the speaker 17 to pass unimpeded out of the stylus 20.

Reference can be made to Fig. 4A in conjunction with the block diagram of Fig. 3A to illustrate the operation of the invention in its preferred embodiment. Reference can also be made to the flow diagram of Fig. 7 for the sequence of operational steps which are carried out by the pen-based computer system 74. In Fig. 4A, the receiver 52 receives the ' signal at time T1 from the pen-based computer system and in particular from the antenna 62. Reference to Fig. 7 will show that in step 700, this begins the stylus voice feature control.

In step 702, the pen-based computer system sends the F' signal to enable microphone operation. The F and F' signals are transferred from the receiver 52 through the multiplexer 36' to the CODEC 13, selectively enabling encoding of the analog waveform from the microphone 16 into a sampled and digitized waveform which will then be passed over the line E and output to the multiplexer 36'. F and F' are complementary, binary signals. F' turns the microphone on and F turns the microphone off. Turning to Fig. 4A, at the later time T2, the stylus 20 is at a remote location with respect to the tablet 54, sufficiently far away that the signal strength detector 32 does not detect any electromagnetic signal radiated from the tablet 54. This can be seen by the packet at T2 in Fig. 4A, which does not have any signal B which would indicate the receipt at the stylus of a radiative pickup signal from the tablet 54. The packet at T2 does include a voice signal E which has been output from the CODEC 13 through the multiplexer 36' and is output through the transmitter 46 and the antenna 48. This can be an example of the user using the stylus as a personal microphone at a position remote from the tablet 54, to communicate through the computer system 74 to the LAN.

In Fig. 7, this corresponds to step 704 which determines whether there is a radiative signal B received, and if there is not, then the flow loops at step 704. In Fig. 4A, at the later time T3, the packet depicted shows that in addition to a voice signal E being transmitted by the transmitter 46, there is a radiative signal B output from the signal strength detector 32. This corresponds to the user having brought the stylus 20 into a relatively close position with respect to the electrostatic tablet 54, so that a radiative signal emitted by the tablet 54, will be picked up by the detector 32. This condition is shown in the flow diagram of Fig. 7, where step 704 determines that there is a radiative signal B received. The flow diagram of Fig. 7 then flows to step 706 where the pen-based computer system 74 can optionally send a voice prompt E* which is shown at time T3' in Fig. 4A. The voice prompt at time T3' can for example, be the voiced message "close," which can be transmitted from the pen-based computer system 74 over the antenna 62 and received at the receiver 52 of the stylus, where it is passed through the multiplexer 36' to the CODEC 13 over line E. The CODEC 13 will receive the digitized voice signal and will decode it, producing the analog waveform of the voice message, which is output to the speaker 17. The flow diagram in Fig. 7 then passes to step 708 which

determines whether there is a pressure signal A received. At this stage since there is no pressure signal A, the step 708 remains in a loop at that step.

In Fig. 4A, at the later time T4, the packet contains both a voice signal E, a signal strength detector signal B, and a pressure signal A. The pressure signal A indicates that there has been a mechanical touchdown of the tip 4 of the stylus 20 on the surface of the digitizing display 54. In the flow diagram of Fig. 7, step 708 determines that there has been a pressure signal A received by the pen-based computer system 74. The flow of Fig. 7 then goes to step 710 which sends a F signal to the stylus 20 to disable the microphone. This function is initiated to decouple the microphone from the transmitter 46 in the stylus 20, in order to avoid picking up the spurious acoustic noise from the stylus tip 4 as it is rubbed against the surface of the tablet 54. Reference to Fig. 4A will show that at the time T5, the receiver 52 receives the signal F and this signal will be passed through the multiplexer 36' and over the line F to control the CODEC 13 to stop encoding the analog output from the microphone 16. Fig. 7 also shows the flow passing to step 712 which optionally has the pen-based computer system 74 send a voice prompt E* over the antenna 62 to the stylus 20. In step 712, an example voice prompt would be the voiced word "down," which can prompt the user that an actual mechanical contact has been detected between the tip 4 for the stylus and the digitizing display 54. Transmitter 46 passes the E* signal through the multiplexer 36' and over the E line to the CODEC 13 where it is decoded and the analog waveform representing the voiced word "down" is passed to the speaker 17 for acoustical presentation by the stylus. The flow diagram of Fig. 7 then passes to step 714 which determines if the pressure signal A is still received, and in this stage of the example it is still received. Therefore, step 714 loops to itself.

In Fig. 4A, at the later time T6, the packet shows that there is no longer any E voice signal being transmitted from the microphone 16 to the pen-based computer system 74. At the later time T7 in Fig. 4A, the packet shows that there is no longer a pressure signal A represented in the packet. This would correspond to the user having raised the pen tip 4 from mechanical contact with the surface of the digitizing display 54. In the flow diagram of Fig. 7, step 714 determines that the pressure signal A is no longer being received. Therefore, the process flows to step 716 which optionally sends a voice prompt E* from the pen-based computer system 74 to the stylus 20. In this example, the voice prompt in step 716 is the voiced word "up," which can indicate to the user that mechanical contact is no longer occurring between the tip 4 and the surface of the digitizing display 54. Fig. 7 also shows the flow to the next step 718 which has the pen-based computer system 74 sending the F' signal to enable the microphone. The F' signal is transmitted from the antenna 62 to the antenna 48 of the stylus 20, and is received at the receiver 52 and passed through the multiplexer 36' and passes over the F line to the CODEC 13. The CODEC 13 is then controlled to encode any analog waveform received from the microphone 16, by sampling the waveform and digitizing the waveform and then passing the digitized stream over the line E to the multiplexer 36'. This function is performed since now the tip 4 is no longer in mechanical contact with the surface of the digitizing display 54, and therefore there is no longer a concern for the pickup of acoustic noise. The flow diagram of Fig. 7 then flows to step 720 which determines if the radiative signal B is still being received. At this stage of the example, it is still being received and therefore step 720 goes into a loop with itself. Reference can be made to Fig. 4A which shows that at time T8, the receiver 52 has received the voice prompt E* and it has also received the signal F' to enable the microphone.

Reference to Fig. 4A shows that at time T9, the stylus is still close enough to the digitizing display 54 to pick up the radiative signal from the display 54, and therefore the signal B is included in the packet. Fig. 4A shows at time T10, that the stylus has been removed far enough away from the digitizing display 54, so that it can no longer detect the radiative signal with the signal strength detector 32. This can be seen by the absence from the packet of the signal B.

In Fig. 7, the flow diagram shows that in step 720, it is determined that the radiative signal B is no longer received. Therefore, the flow proceeds to step 722 which can now handle other voice prompts. An example voice prompt can be in association with a background communications program running in the pen-based computer system 74, which is an electronic mail or E-mail application. If electronic mail has been received at the pen-based computer system 74, from elsewhere in the LAN network, the voice prompt E* with the message "check E-mail," can be transmitted from the antenna 62 to the stylus 20 for presentation by the speaker 17. This is shown in Fig. 4A at the time T11. Then, Fig. 7 shows the flow proceeding back to step 704, which determines whether a radiative signal B has been received. The flow diagram will remain in a state of step 704 until the stylus 20 is brought into close enough proximity to the digitizing display 54, so that its radiative signal can be picked up by the radiative pickup antenna 29.

An alternate embodiment invention of the invention is shown in Figs. 3B, 3C and 4B. In the alternate embodiment of the invention, in addition to the remote control of the microphone by means of the transmission of the signals F and F' from the pen-based computer system 74 to the stylus 20, an additional feature can be the direct control by the pressure detector 42 or alternately by the signal detector 32 of a microphone switch 19 which selectively couples the microphone 16 to the multiplexer 36'. A detailed logic diagram of the microphone switch 19 is shown in Fig. 3C. The microphone switch 19 has the same F line connecting to it as was described above. An additional line G is a control line from the multiplexer 36' to the microphone switch 19. The control line G selects the direct control by the pressure detector 42 of the microphone switch 19. If the G signal is received by the microphone switch 19, when the pressure detector 42 outputs a contact detection signal on line 21, it actuates the interrupt switch 31 which prevents the microphone 16 from transmitting its signal to the CODEC 13. Alternately, if the signal G' which is the complement of G, is input to the microphone switch 19, then the interrupt switch 33 is effective in applying the disabled microphone signal F received from the pen-based computer system 74, in remotely controlling whether the microphone 16 is operatively coupled to the CODEC 13 as previously described.

Additional details as to the operation of the microphone switch 19 can be seen with reference to Fig. 3C. If the select-direct-pressure signal G is applied to the microphone switch 19, the flip-flop 25' is set which turns on the switch 25 connecting the microphone 16 over line 23 to the interrupt switch 31. Correspondingly, the signal G is inverted in the inverter 37 and its complement G' is applied to the flip-flop 27' which disables the switch 27 connecting the output of the microphone 16 over line 23 to the interrupt switch 33. In this state, with the switch 25 selected, if no contact signal is received over line 21 from the pressure detector 42, then the interrupt switch 31, maintains the connection between the switch 25 and the CODEC 13 over line 35. Thus, any signal from the microphone 16 over line 23 is passed through the switch 25 and the interrupt switch 31 to the CODEC 13. If the pressure detector 42 outputs a contact signal over line 21 to the interrupt switch 31, the connection between the switch 25 and the CODEC 13 is interrupted. Thus, a direct control by the pressure detector 42 is obtained over the connection of the microphone 16 to the CODEC 13. Thus, as soon as the tip 4 of the stylus 20 is in mechanical contact with the digitizing display 54, the signal from the microphone 16 is interrupted and not permitted to reach the CODEC 13. This prevents the pickup of acoustic noise from the tip 4 as it rubs across the surface of the digitizing tablet 54.

Alternately, if the pen-based system 74 sends a complement signal G' to the stylus 20, then Fig. 3C shows that the flip-flop 25' is switched to its opposite state which disables the switch 25. Correspondingly, the inverter 37 inverts the signal G' into the true signal G which sets the flip-flop 27' so as to enable the switch 27. Switch 27 can then connect the microphone 16 to the interrupt switch 33. Now, if the signal F' (the complement of F) which is an enable microphone signal is received from the pen-based computer 74 to the stylus 20, the interrupt switch continues to maintain the connection between the switch 27 and the CODEC 13. Thus, the microphone 16 is enabled to transmit its waveform over line 23 through the switch 27 and the interrupt switch 33 to the CODEC 13. When the disable microphone signal F is received at the flip-flop 33', it switches the interrupt switch 33 so as to interrupt between the switch 27 and the CODEC 13. This operation is under remote control of the pen-based computer system 74. In this condition, the microphone 16 is no longer able to transmit its waveform through the interrupt switch 33.

Reference to Fig. 4B will illustrate the operation of this second embodiment of the invention. The select-direct-pressure signal G is received at time T1 by the receiver 52. At the later time T2, a packet is transmitted over the transmitter 46 which includes a microphone output E. This would correspond to a remote position of the stylus. The stylus in this stage is under direct pressure control with the microphone on. At the later time T3, with the stylus being brought closer to the digitizing display, the radiative signal B is included in the packet. At the later time T3', the voice prompt "close" can be received at the stylus. At the later time T4, the packet shows that a touchdown has occurred with the A signal present in the packet. In accordance with the second embodiment of the invention as shown in Figs. 3B and 3C, the presence of the A signal shows that the pressure detector 42 has output a signal over line 21 indicating contact, to the interrupt switch 31. The interrupt switch 31 then interrupts the path between the switch 25 and the CODEC 13. Reference to Fig. 4B shows that the packet at time T4 does not have a E signal from the microphone 16. The pressure detector 42 has been effective in interrupting the microphone 16 operation as the stylus tip 4 comes into mechanical contact with the surface of the digitizing display 54. Fig. 4B also shows that the voice prompt "down" can be transmitted from the pen-based computer system to the stylus 20. The later time T5 shows that the interrupted microphone operation continues. At the later time T6, the receiver 52 receives the complement G' signal

which deselects the direct-pressure-control of the microphone switch 19, applying the alternate control by the pen-based computer system 74. This is followed at time T6 by a receipt of the F' signal from the pen-based computer system 74, which insures that the interrupt switch 33 connects the switch 27 to the CODEC 13 so that any signal from the microphone 16 will reach the CODEC 13. Reference to Fig. 4B shows at time T7, there is a microphone signal E in the packet. At the later time T8, a F signal is received which disables the microphone. This signal is received from pen-based computer system 74. Reference to Fig. 4B shows that at the later time T9, the packet no longer has a microphone signal E in it. This is because the interrupt switch 33 has been set by remote control, to interrupt the path between the switch 27 and the CODEC 13. Then in Fig. 4B, the later time T11 shows the absence of a pressure signal A, which indicates that the pen tip 4 has been raised from the surface of the digitizing display 54. However, now that the microphone operation is under the control of the pen-based computer system 74, the pen-based computer system 74 must receive the packet transmitted by the transmitter 46 at time T11, before it can respond with any program initiated change in the operating status of the microphone 16. Fig. 4B shows that at the later time T12, a signal F' is received by the receiver 52, which enables the microphone 16, by reconnecting the interrupt switch 33 between the switch 27 and the CODEC 13. Optionally, a voice prompt E* can also be transmitted to the stylus at time T12. Then at the later time T13, Fig. 4B shows that there is now a microphone signal E in the packet.

Thus it is seen that in the second embodiment of the invention shown in Figs. 3B, 3C and 4B, both remote control by the pen-based computer system 74 and local control by the pressure detector 42 can be alternately used to control the connection of the microphone 16 to the CODEC 13.

Speech data output from the microphone 16 and received at the pen-based computer system 74, can be converted into operational data and control information by a suitable voice recognition program in system 74, such as that described in copending U. S. patent application serial number 07/968,097, filed October 29, 1992 by V. Stanford, et al. entitled "Method for Word Spotting on Continuous Speech," assigned to IBM Corporation and incorporated herein by reference.

The digitizing display 22 can be, for example, a transparent overlay superimposed on a conventional display monitor or a workpad coupled to a pen-based computer system. Included in the overlay, for example, can be the embedded antenna 62. Alternately, the antenna 62 can be proximate to the transparent overlay, but sufficiently close to enable detection of the multiplexed data stream transmitted from the antenna 48 of the stylus 20.

In accordance with the invention, the stylus 20 transmits by means of the antenna 48 information from the pressure detector 38 and the X-Y detector 29 to the antenna 62 in the digitizing display 22. Antenna 62 in the digitizing display 22, is coupled through the amplifier 64 to the FSK receiver 66. The output of the receiver 66 is then applied to a microprocessor 68. The microprocessor 68 can, for example, strip out the respective numbers representing the contact pressure detected by the detector 38 in the stylus 20 and separately, the number representing the X-Y position location of the stylus with respect to the electrostatic tablet 54. The numerical values can then be forwarded by the microprocessor 8 to the pen-based computing system 74.

Further in accordance with the invention, the stylus 20 can include a transmit/receive switch 50 which alternately connects the antenna 48 to either the FSK transmitter 46 or alternately to the FSK receiver 52 in the stylus 20. If the receiver 52 is connected to the antenna 48, the the stylus 20 can receive information in the form of electromagnetic signals radiated from the antenna 62 in the digitising display 22. In this mode of operation, the FSK transmitter 70 transfers digital information from the microprocessor 68 to the amplifier 72, which applies the digital information over the antenna 62 of the digitizing display 22. The radiated electromagnetic signals from the antenna 62 containing the digital information from the microprocessor 68, is radiated to the antenna 48 in the stylus 20. The antenna 48 is then connected through the transmit/receive switch 50 to the FSK receiver 52, which applies the received digital information from the digitizing display 22 to the multiplexer 36. The multiplexer 36 will then apply the digital information to for example a storage device 76 in the stylus 20 or the RAM 106 in Fig. 3A. In this manner, digital information can be transmitted from the digitizing display 22 and received and stored in the stylus 20.

The side cross-sectional view of the stylus 20 shown in Fig. 2 provides a detailed illustration of the mechanical parts of the pressure contacting portion 38. The stylus 20 is designed to precisely determine when the tip 4 is in mechanical contact with the electrostatic tablet 54 and when it is not in mechanical contact. However, the tip contacting portion 38 can also output several intermediate states of pressure. For example, the contact portion 38 of the stylus 20 can output 16 levels represented by four binary bits of pressure. The 16 levels of pressure can be used for applications such as shading of drawings, moving a cursor fast or slow, drawing heavy or light lines, and other

drawing applications. The construction of the stylus 20 shown in Fig. 2 enables very small longitudinal displacement of the probe tip 4 within the housing 2 to detect a range of force from 30 grams to 300 grams. The stylus 20 can use a transducing material such as the force sensing resistor made by Interlink, described above.

The design of the contact portion 38 shown in Fig. 2 eliminates friction which would prevent the detection of low pressure. It also allows the stylus to relax back to its non-contact state, to avoid confusing readings when detecting the tip 4 is just coming off the surface of the display 54. The design shown in Fig. 2 also provides a very low pre-load pressure on the force sensing resistor 10 so that the dynamic range of the force sensing resistor 10 is maximized. In addition, the design of the contact portion 38 in Fig. 2 minimizes the detection of lateral rather than axial or longitudinal forces.

The tip 4 of Fig. 2 floats freely between the cone 3 and a brass shaft which holds the ball of the electrostatic sensor 29, as described in the above referenced USP 5,117,071. Bushings 8 and 9 are made of tetrafluoroethylene to minimize friction.

The gasket 6 is made of very low durometer rubber to establish a minimum amount of pre-load pressure. Without some pre-load pressure, the tip 4 will move around inside the cone 3 and create false readings as the stylus 20 is moved, rotated, shaken or tilted. However, if the gasket 6 is too stiff, this will reduce the sensitivity of the stylus to the detection of low forces and reduce the dynamic range of the stylus.

The tip 4 detects axial forces, along the line of the axis of the housing 2. The pen tip 4 contains the electrostatic sensing element 29 used for X-Y position determination, as is described in USP 5,117,071. The force sensing resistor 11 is the type used in membrane switch devices. The force sensing resistor 11 meets with a small circular printed circuit board 10 which is used to make appropriate contact with the force sensing resistor 11.

The force sensing resistor 11 generates a variable resistance which depends on the pressure applied to it by the tip. The force sensing resistor 11 can be biased by a reference voltage source for example 1.4 volts, so that a differential voltage across the device can be amplified by the operational amplifier 40. The output voltage can be adjusted to match the output voltage for the range of X-Y positioning of the amplifier 30 for the electrostatic pickup device 29. In this way, a common analog-to-digital conversion circuit could be used to digitize both the pressure output by the pressure detector 42 and the signal strength output by the signal strength detector 32 in Fig. 1. In such an alternate embodiment, appropriate switching between the pressure detector 42 and the signal detector 32 with the single analog-to-digital converter could be accomplished to perform an analog multiplexing of the analog signal input to the common analog-to-digital converter. Item 8 in Fig. 2 is a bushing to maintain the tip 4 in concentric alignment with the cone 3 attached to the tubing 2 of the stylus 20. The separator 5 shown in Fig. 2 can be used to separate the pressure detecting electronics 42 from the signal strength detecting electronics 32 in the stylus 20.

In another embodiment of the invention, the storage device 76 can be a read-only storage such as 104 in Fig. 3A, which stores a personal identification number or a password or other security information, which can be transmitted from the stylus 20 to the digitizing display 22, for processing in the pen-based computer 74, to validate the stylus or the user of the stylus.

Fig. 5 shows a more detailed view of the workpad embodiment of the digitizing display 22 and the associated pickup stylus 20. Fig. 6 is a side view of the workpad 22. Fig. 5 and Fig. 6 show the relative location of the embedded antenna 62 within the housing of the workpad 22. It can be seen how the electrostatic tablet 54 with its horizontal and vertical conductors 56 and 58 are positioned in relation to the antenna 62. The wire 74 connects the workpad 22 to the pen-based computing system.

Thus it is seen that the invention provides an improved voice communication feature incorporated into an untethered personal stylus for a digitizing display. The microphone 16 in the stylus can provide speech data to the pen-based computer system 74, which can be recognized by suitable voice recognition programs, to produce operational data and control information to the application programs running in the computer system. This can be combined with tip location data received from the stylus. In response, the pen-based computer system 74 can transmit voice messages back to the speaker 17 in the stylus, providing voice prompts to the user. The invention thus provides for multimedia communication between the user and the system.

Although specific embodiments of the invention have been disclosed, it will be understood by those having skill in the art that changes can be made to those specific embodiments without departing from the spirit and the scope of the invention.

Claims

1. In a data processing system, a multimedia stylus (20) for a digitizing display, comprising:
   a multiplexer (36) in said stylus, having an

input coupled to a receiver for receiving data from said data processing system, and having an output coupled to a transmitter, for transmitting data to said data processing system;
a position detector (38) in said stylus, coupled to an input of said multiplexer, for generating a position indicating signal from said digitizing display and in response, said multiplexer transmitting a first signal through said transmitter to said data processing system;
a microphone (16) in said stylus, coupled to an input of said multiplexer, for converting an input audio signal of a first audio message into a second signal transmitted by said multiplexer through said transmitter to said data processing system;
said data processing system sending to said receiver in said stylus third signal, in response to said first signal;
a speaker (17) in said stylus coupled to an output of said multiplexer, for receiving said third signal representing a second audio message and producing an output audio signal in response to said first signal.

2. In a data processing system, a multimedia stylus for a digitizing display, comprising:
a multiplexer in said stylus, having an input coupled to a receiver in said stylus for receiving data from said data processing system, and having an output coupled to a transmitter in said stylus for transmitting data to said data processing system;
a radiative pickup antenna in said stylus, coupled to an input of said multiplexer, for receiving position indicating electromagnetic signals from said digitizing display and in response, said multiplexer transmitting first signals through said transmitter to said data processing system;
said data processing system receiving said first signals and in response thereto, sending to said receiver in said stylus second signals representing a first audio message;
a speaker in said stylus, coupled to an output of said multiplexer, for receiving said second signals and producing an output audio signal of said first audio message.

3. The system of claim 2, which further comprises:
a microphone in said stylus, coupled through a switch means to an input of said multiplexer, for converting an input audio signal of a second audio message into third signals;
said data processing system sending to said receiver in said stylus fourth signals, for controlling said switch means;
said switch means selectively coupling said microphone to said transmitter through said multiplexer in response to said fourth signals;
whereby said microphone is selectively coupled to said transmitter in response to said position indicating electromagnetic signals received by said radiative pickup antenna.

4. The system of claim 2, which further comprises:
a mechanical contact sensor in said stylus, coupled to an input of said multiplexer, for generating contract indicating signals and in response, said multiplexer
transmitting third signals through said transmitter to said data processing system;
said data processing system receiving said third signals and in response thereto, sending to said receiver in said stylus fourth signals representing a second audio message;
said speaker in said stylus receiving said fourth signals and producing a second output audio signal of said second audio message.

5. The system of claim 4, which further comprises:
a microphone in said stylus, coupled through a switch means to an input of said multiplexer, for converting an input audio signal of a third audio message into fifth signals;
said data processing system sending to said receiver in said stylus sixth signals, for controlling said switch means;
said switch means selectively coupling said microphone to said transmitter through said multiplexer in response to said sixth signals;
whereby said microphone is selectively coupled to said transmitter in response to said contact indicating signals generated by said mechanical contact sensor.

6. The system of claim 4, which further comprises:
a microphone in said stylus, coupled through a switch means to an input of said multiplexer, for converting an input audio message into fifth signals;
said switch means having a control input coupled to said mechanical contact sensor, for selectively coupling said microphone to said transmitter through said multiplexer in response to said contact indicating signals.

7. In a data processing system, a multimedia stylus for a digitizing display, comprising:
a multiplexer in said stylus, having an input coupled to a receiver for receiving data from said data processing system, and having an

output coupled to a transmitter, for transmitting data to said data processing system;
a position detector in said stylus, coupled to an input of said multiplexer, for generating a position indicating signal from said digitizing display and in response, said multiplexer transmitting a first signal through said transmitter to said data processing system;
an audio means in said stylus coupled to an output of said multiplexer, for receiving a second signal from said receiver;
said data processing system receiving said first signal and in response thereto, sending said receiver said second signal.

8. The system of claim 7, which further comprises:
said audio means is a speaker in said stylus, for receiving said second signal representing an audio message and producing an output audio signal in response to said position sensing signals.

9. The system of claim 7, which further comprises:
said audio means is a microphone in said stylus, coupled through a switch means to an input of said multiplexer, said switch means being coupled to an output of said multiplexer, for selectively converting an input audio signal into a third signal;
said switch means selectively coupling said microphone to said transmitter through said multiplexer in response to said second signal.

10. In a data processing system, a multimedia stylus for a digitizing display, comprising:
a multiplexer in said stylus, having an input coupled to a receiver for receiving data from said data processing system, and having an output coupled to a transmitter, for transmitting data to said data processing system;
a position detector in said stylus, coupled to an input of said multiplexer, for generating a position indicating signal from said digitizing display and in response, said multiplexer transmitting a first signal through said transmitter to said data processing system;
a microphone in said stylus, coupled through a switch means to an input of said multiplexer, said switch means having a control input coupled to said position detector, for selectively transmitting an audio signal through said multiplexer and transmitter to said data processing system;
said switch means selectively coupling said microphone to said transmitter through said multiplexer in response to said position indicating signal from said position detector.

11. The system according to any one of the above claims, wherein
said position detector is a radiative pickup antenna in said stylus, for receiving a position indicating electromagnetic signal from said digitizing display and in response, outputting said first signal.

12. The system according to any one of the above claims, wherein
said position detector is a mechanical contact sensor in said stylus, for generating a contact indicating signal from mechanically contacting said digitizing display and in response, outputting said first signal.

FIG. 1

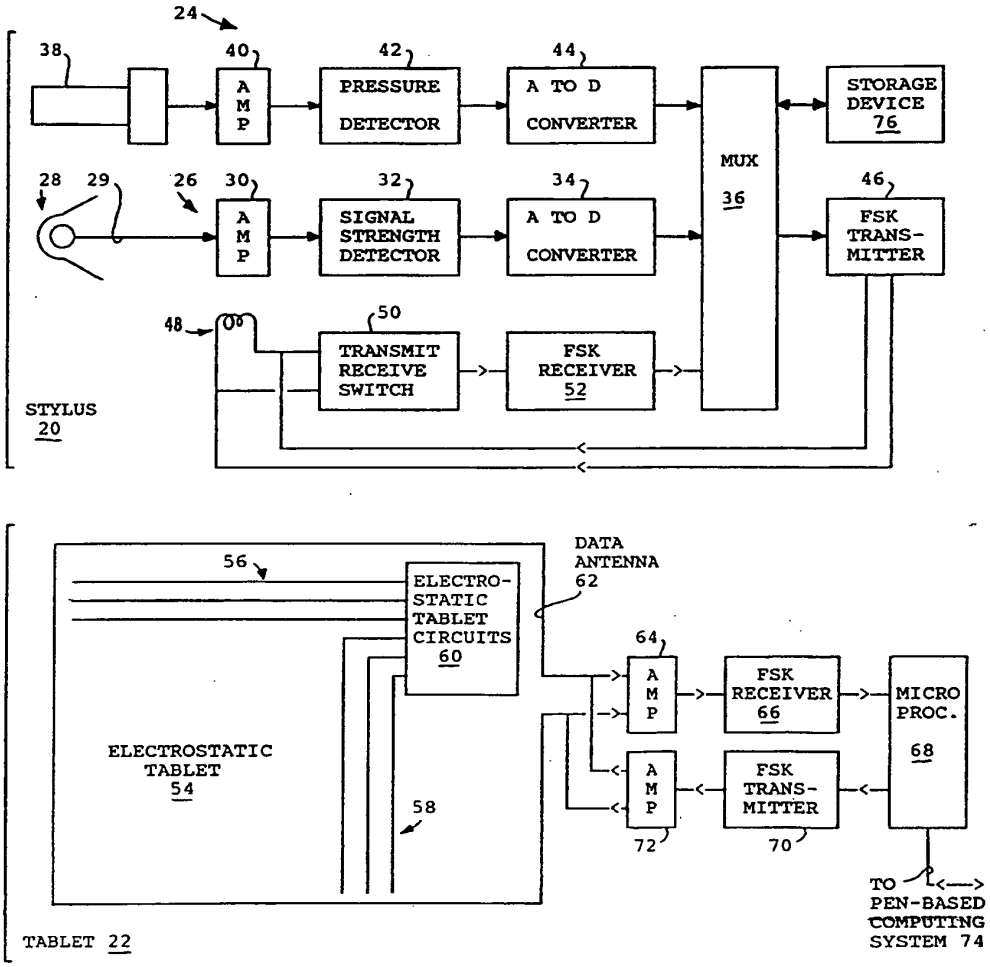

24
38
40
A M P
42
PRESSURE DETECTOR
44
A TO D CONVERTER
MUX 36
STORAGE DEVICE 76
28
29
26
30
A M P
32
SIGNAL STRENGTH DETECTOR
34
A TO D CONVERTER
46
FSK TRANS-MITTER
48
50
TRANSMIT RECEIVE SWITCH
FSK RECEIVER 52
STYLUS 20
56
ELECTRO-STATIC TABLET CIRCUITS 60
DATA ANTENNA 62
64
A M P
FSK RECEIVER 66
MICRO PROC. 68
ELECTROSTATIC TABLET 54
58
A M P
72
FSK TRANS-MITTER
70
TO PEN-BASED COMPUTING SYSTEM 74
TABLET 22

FIG. 1B

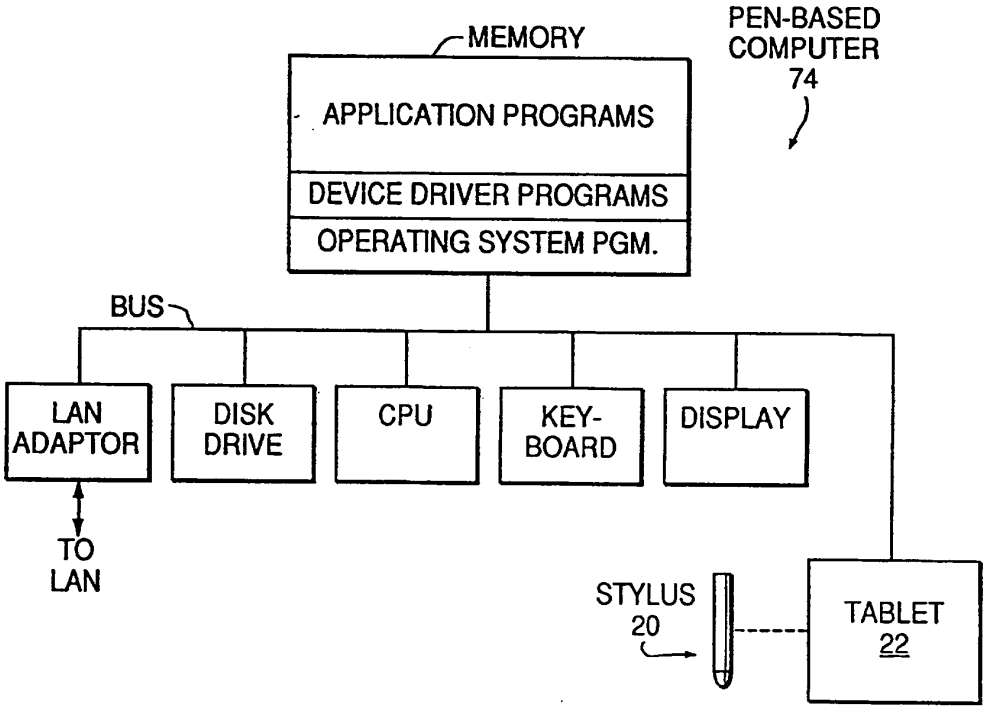

MEMORY
PEN-BASED COMPUTER 74
APPLICATION PROGRAMS
DEVICE DRIVER PROGRAMS
OPERATING SYSTEM PGM.
BUS
LAN ADAPTOR
DISK DRIVE
CPU
KEY-BOARD
DISPLAY
TO LAN
STYLUS 20
TABLET 22

FIG. 2

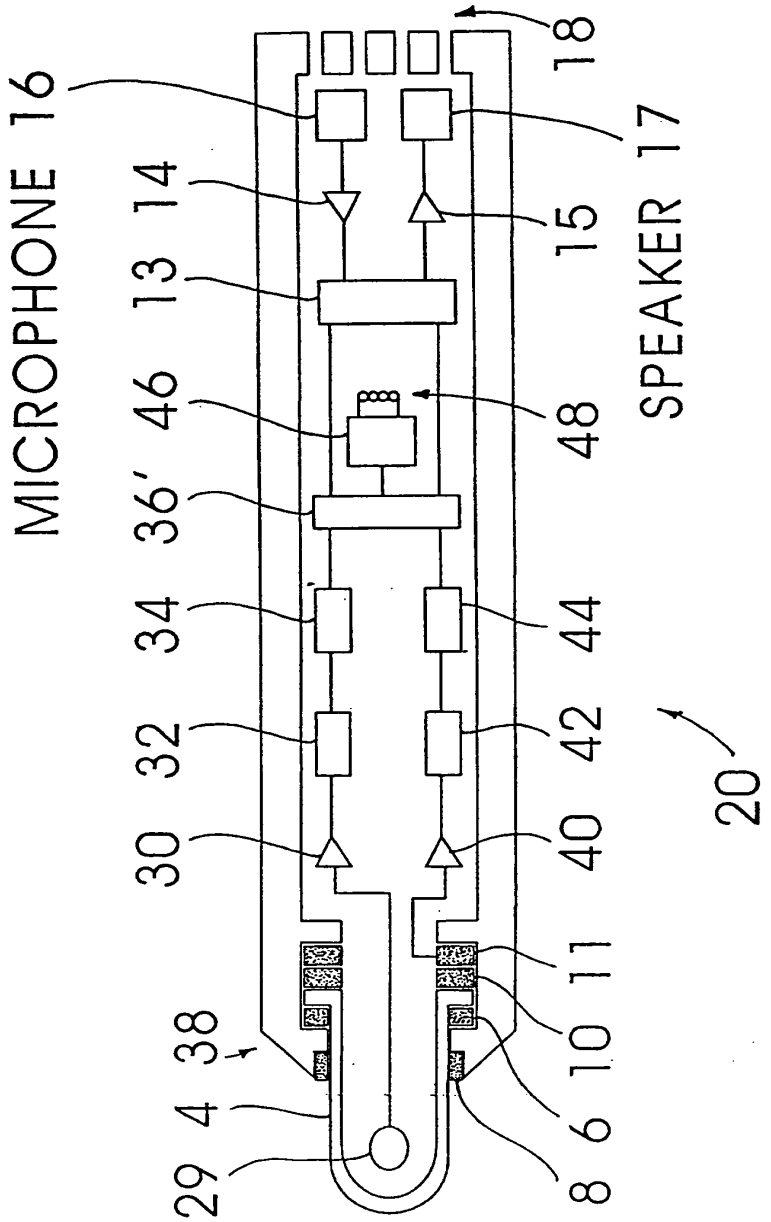

MICROPHONE 16
18
SPEAKER 17
14
15
13
46
48
36'
34
44
32
42
30
40
20
38
11
4
10
29
6
8

FIG. 3A

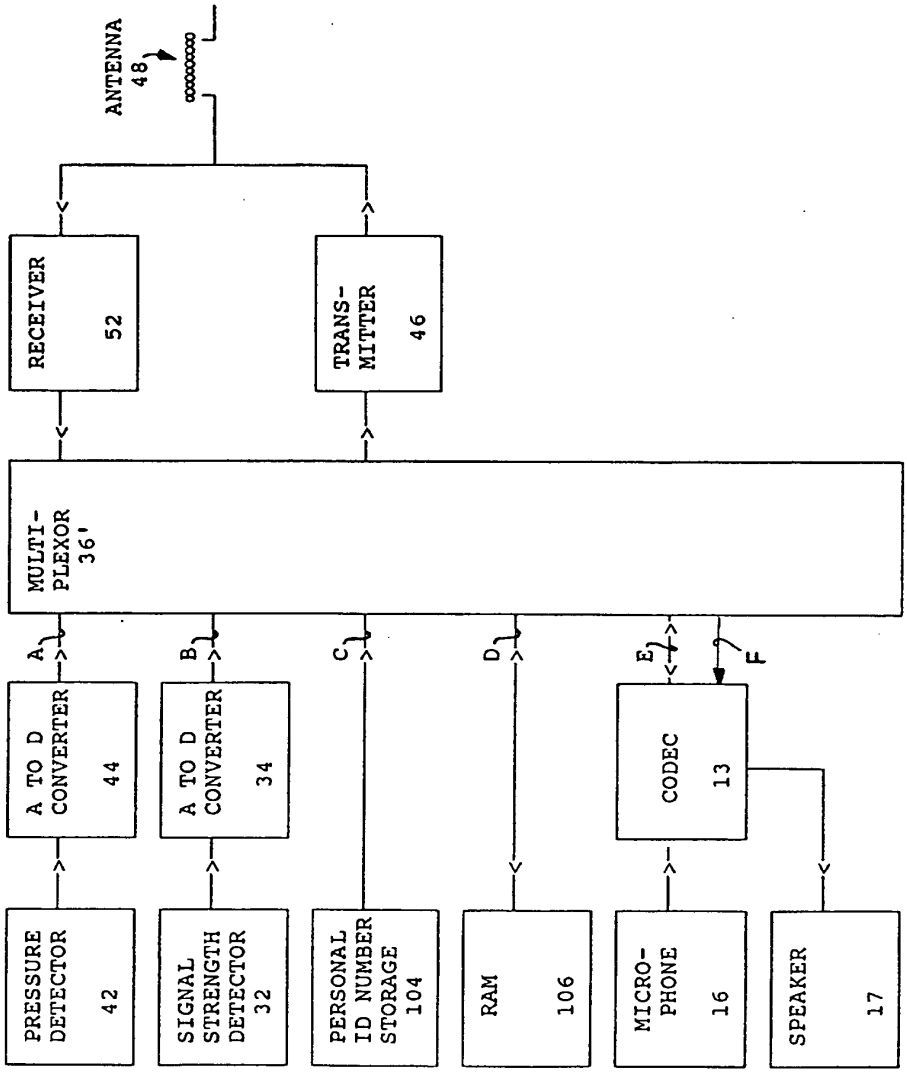

ANTENNA
48
RECEIVER
52
TRANS-
MITTER
46
MULTI-
PLEXOR
36'
A
B
C
D
E
F
A TO D
CONVERTER
44
A TO D
CONVERTER
34
CODEC
13
PRESSURE
DETECTOR
42
SIGNAL
STRENGTH
DETECTOR
32
PERSONAL
ID NUMBER
STORAGE
104
RAM
106
MICRO-
PHONE
16
SPEAKER
17

FIG. 3B

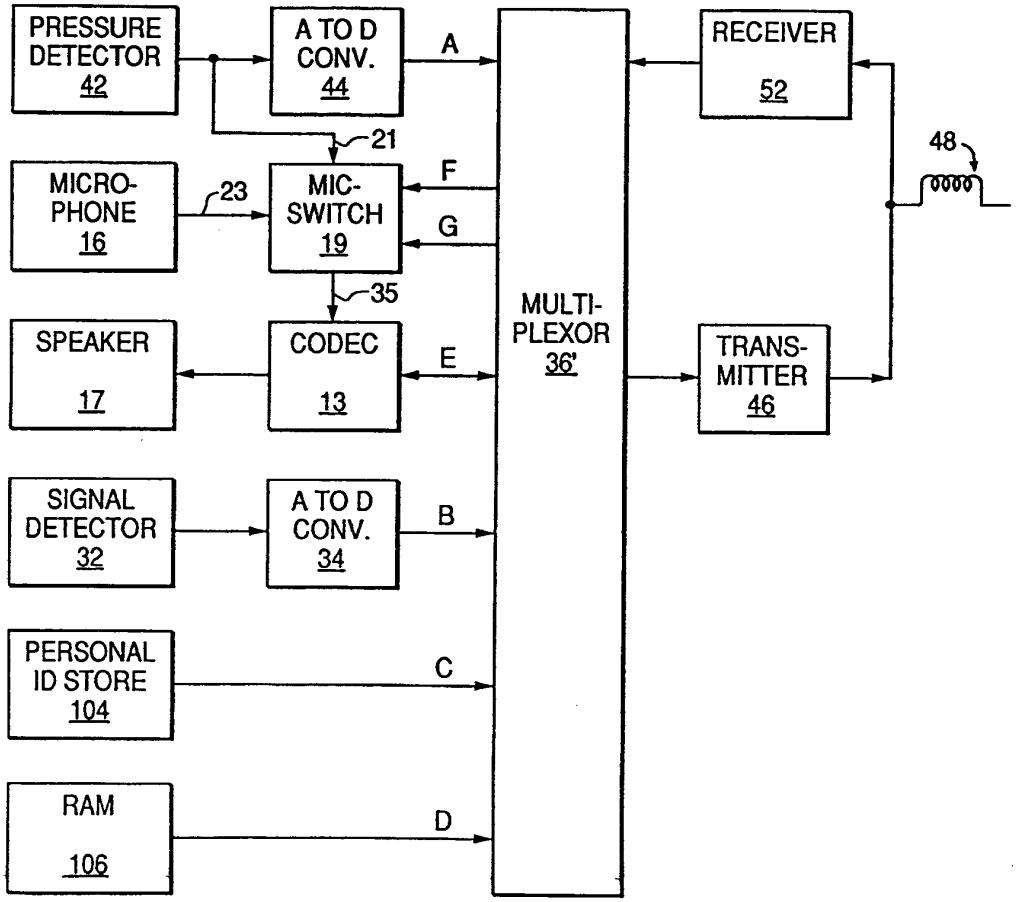
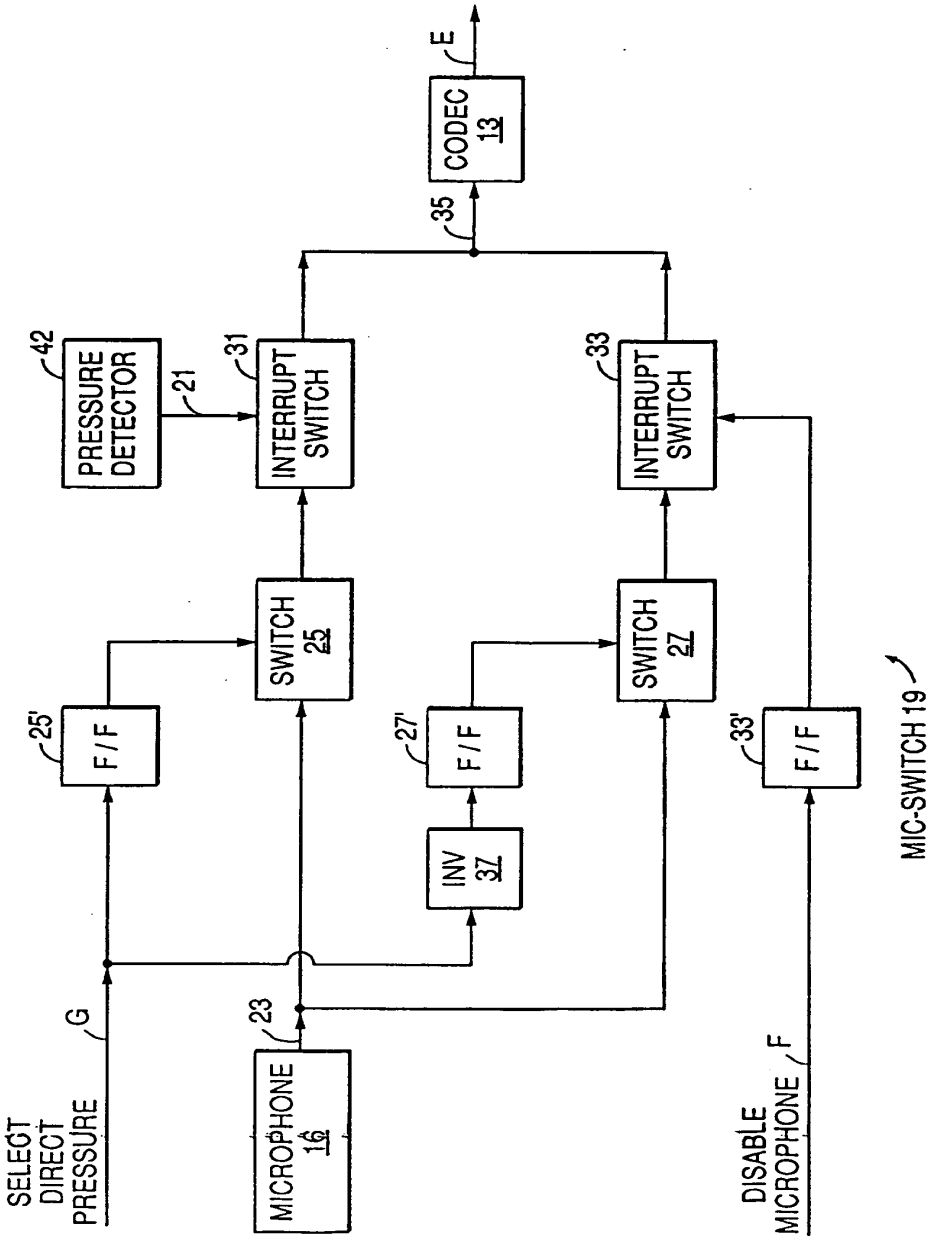

PRESSURE DETECTOR 42
A TO D CONV. 44
A
RECEIVER 52
21
48
MICRO-PHONE 16
23
MIC-SWITCH 19
F
G
35
MULTI-PLEXOR 36'
SPEAKER 17
CODEC 13
E
TRANS-MITTER 46
SIGNAL DETECTOR 32
A TO D CONV. 34
B
PERSONAL ID STORE 104
C
RAM 106
D

FIG. 3C


SELECT DIRECT PRESSURE
G
MICROPHONE 16
23
DISABLE MICROPHONE
F
MIC-SWITCH 19
F / F
25'
F / F
27'
F / F
33'
INV 37
SWITCH 25
SWITCH 27
PRESSURE DETECTOR
42
21
INTERRUPT SWITCH
31
INTERRUPT SWITCH
33
35
CODEC 13
E

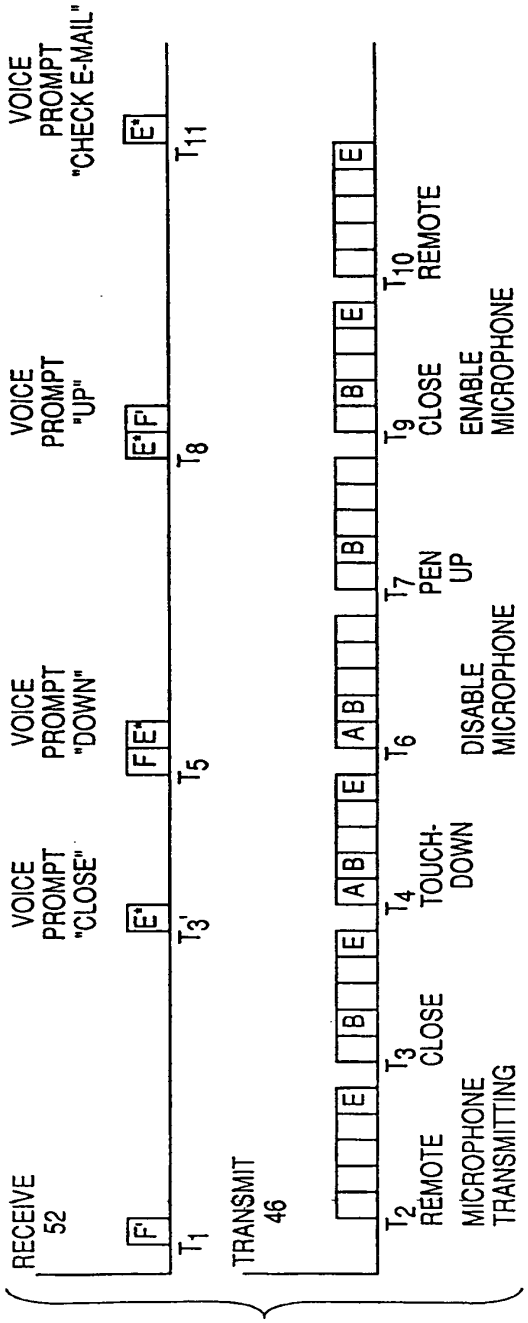

RECEIVE
52
TRANSMIT
46
F'
E'
F E'
E'F'
E'
VOICE
PROMPT
"CLOSE"
VOICE
PROMPT
"DOWN"
VOICE
PROMPT
"UP"
VOICE
PROMPT
"CHECK E-MAIL"
T1
T2
REMOTE
MICROPHONE
TRANSMITTING
T3'
T3
CLOSE
T4
TOUCH-
DOWN
T5
T6
DISABLE
MICROPHONE
T7
PEN
UP
T8
T9
CLOSE
ENABLE
MICROPHONE
T10
REMOTE
T11
E
B
A B

FIG. 4A

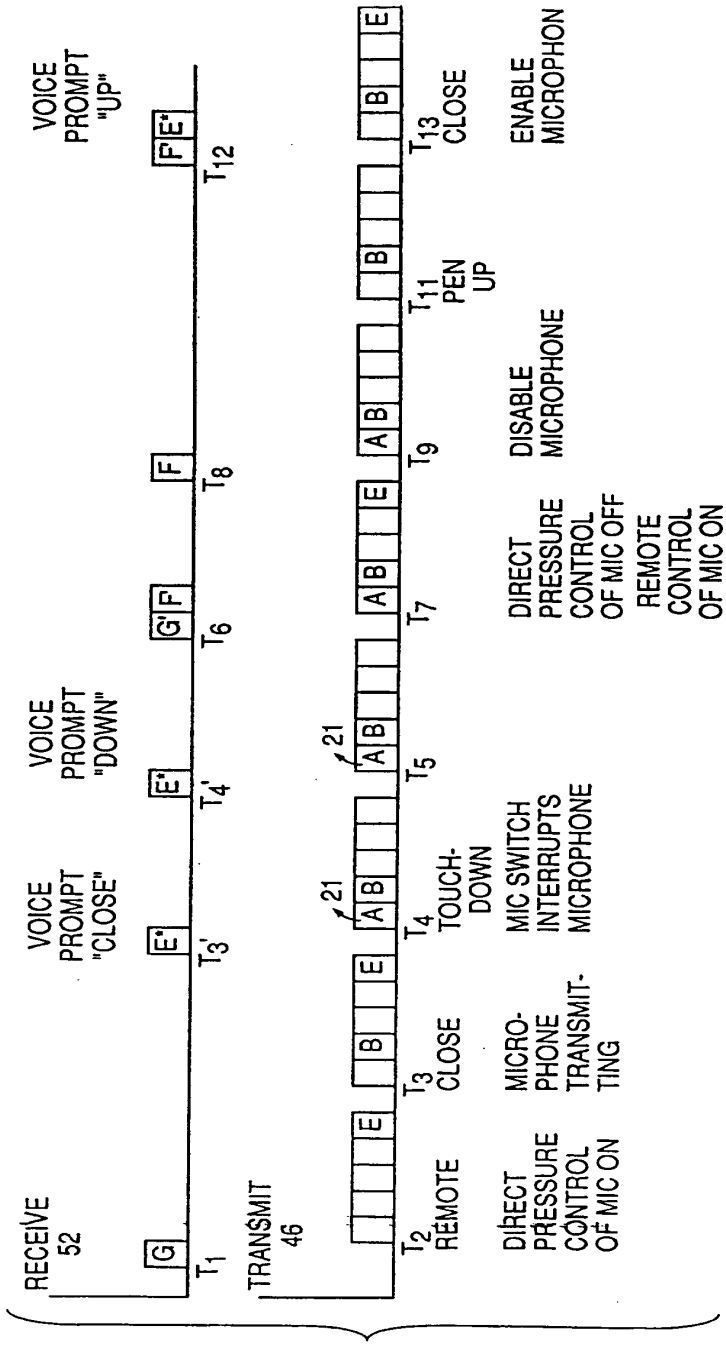

RECEIVE 52
TRANSMIT 46
G
E'
E
B
A B
21
E
F
G'
F
E'
F'
T1
T2 REMOTE
T3' VOICE PROMPT "CLOSE"
T3 CLOSE
T4' VOICE PROMPT "DOWN"
T4 TOUCH-DOWN
T5
T6
T7
T8
T9
T11 PEN UP
T12
T13 CLOSE
MICRO-PHONE TRANSMIT-TING
MIC SWITCH INTERRUPTS MICROPHONE
DIRECT PRESSURE CONTROL OF MIC ON
DIRECT PRESSURE CONTROL OF MIC OFF
DISABLE MICROPHONE
REMOTE CONTROL OF MIC ON
ENABLE MICROPHON
VOICE PROMPT "UP"

FIG. 4B

FIG. 5

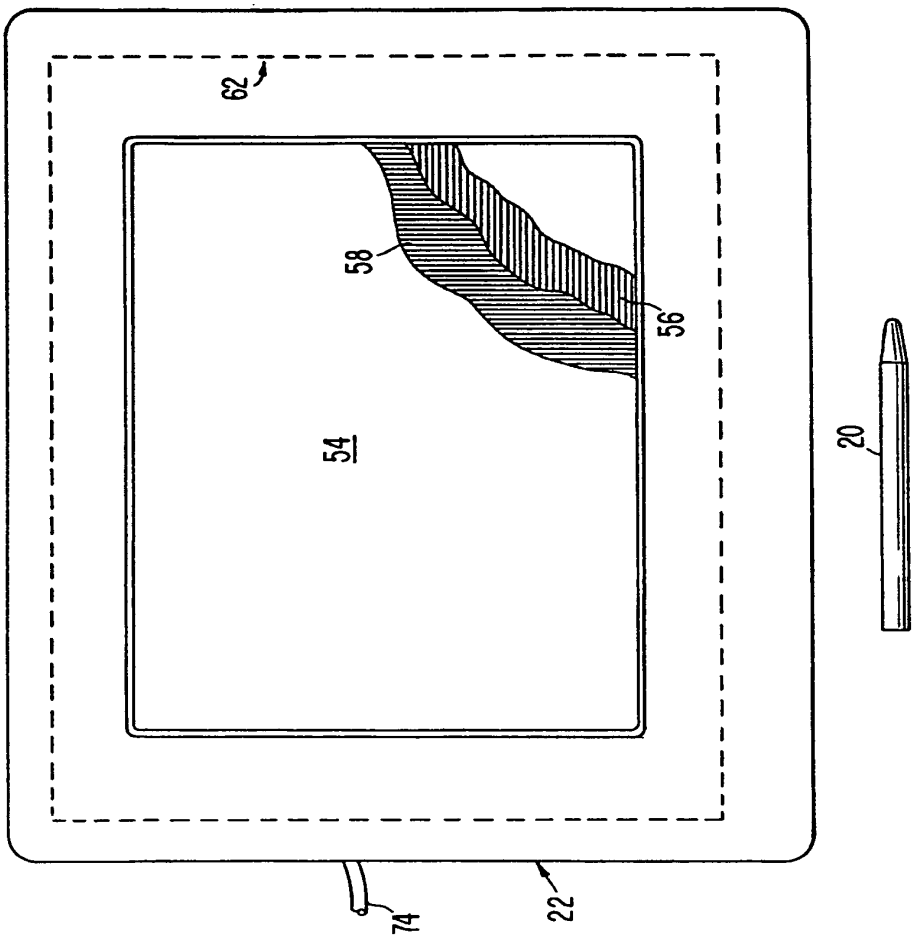


FIG. 6

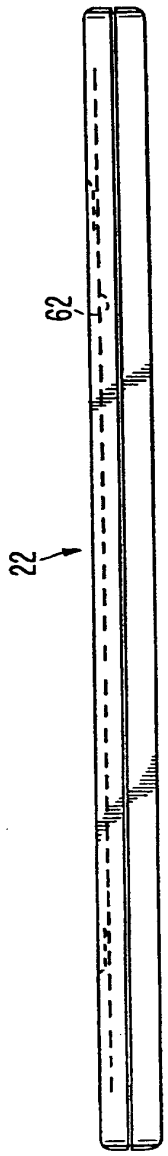
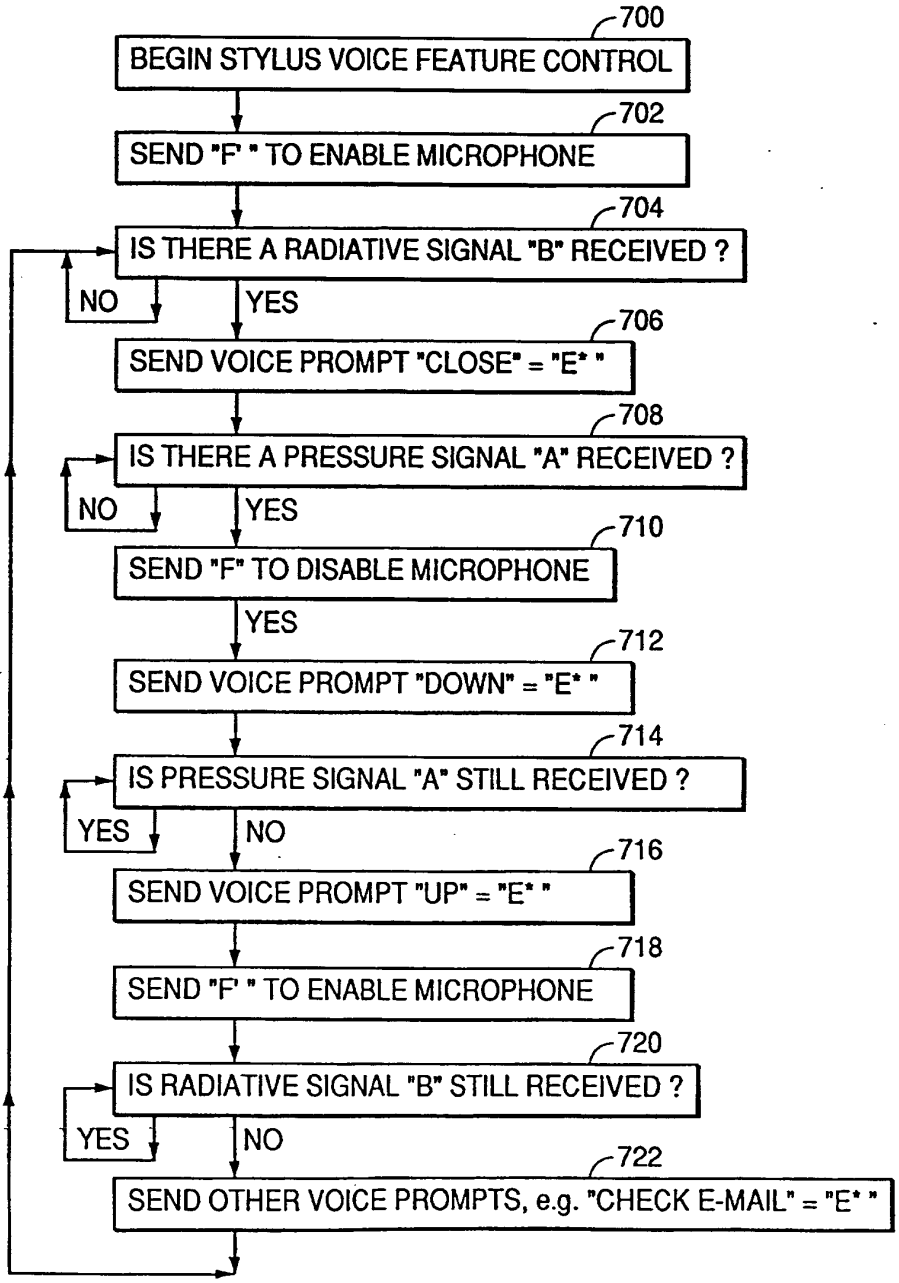


FIG. 7


700
BEGIN STYLUS VOICE FEATURE CONTROL
702
SEND "F" " TO ENABLE MICROPHONE
704
IS THERE A RADIATIVE SIGNAL "B" RECEIVED ?
NO
YES
706
SEND VOICE PROMPT "CLOSE" = "E* "
708
IS THERE A PRESSURE SIGNAL "A" RECEIVED ?
NO
YES
710
SEND "F" TO DISABLE MICROPHONE
YES
712
SEND VOICE PROMPT "DOWN" = "E* "
714
IS PRESSURE SIGNAL "A" STILL RECEIVED ?
YES
NO
716
SEND VOICE PROMPT "UP" = "E* "
718
SEND "F" " TO ENABLE MICROPHONE
720
IS RADIATIVE SIGNAL "B" STILL RECEIVED ?
YES
NO
722
SEND OTHER VOICE PROMPTS, e.g. "CHECK E-MAIL" = "E* "

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 622 724 A3

(12) EUROPEAN PATENT APPLICATION

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(30) Priority: **29.04.1993 US 54807**

(71) Applicant: **International Business Machines Corporation**
Armonk, N.Y. 10504 (US)

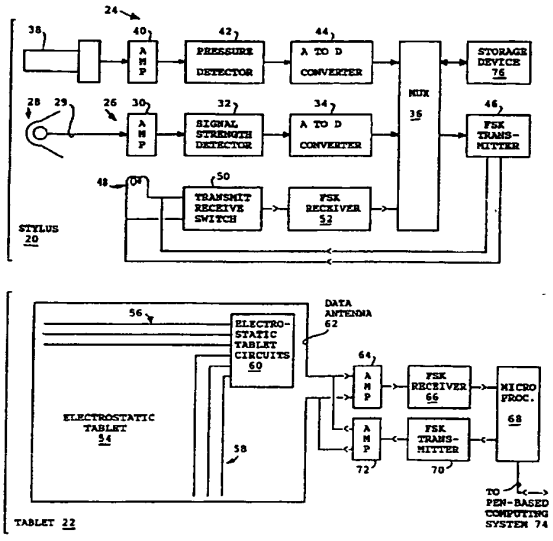
(72) Inventors:
- **Stein, Frank L.**
  Vienna, VA 22182 (US)
- **Verrier, Guy F.**
  Boca Raton, FL 33486 (US)
- **Donaldson, Robert L.**
  Annapolis, MD 21401 (US)
- **Schubert, Karl D.**
  Rockville, MD 20855-2538 (US)

(74) Representative: **Schäfer, Wolfgang, Dipl.-Ing.**
D-70548 Stuttgart (DE)

(54) Voice communication features in an untethered personal stylus for a digitizing display

(57) An improved voice communication feature is disclosed for an untethered personal stylus used with a digitizing display in a pen-based computer system. A microphone and speaker are included in an untethered stylus in conjunction with a mechanical contact and radiative pickup mechanisms, to enable multimedia communication between the user and the pen-based computer system, through a digitizing display.

FIG. 1



EP 0 622 724 A3

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2.9.7/3.4

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 94 10 5878

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
A	IBM TECHNICAL DISCLOSURE BULLETIN, vol. 35, no. 1A, 1 June 1992 pages 49-51, XP 000308769 'PEN-MOUNTED MICROPHONE FOR PEN-AND-TABLET COMPUTERS' * the whole document * ---	1,2,7,10	G06F3/033 G06F3/16 G06K11/16 G06K11/18
A	US-A-4 969 180 (WATTERSON MICHAEL R ET AL) 6 November 1990 * abstract; figures 1-3 * ---	1,2,7,10	
A	RESEARCH DISCLOSURE, no. 342, 1 October 1992 page 763 XP 000326661 'NOTIFICATION PEN' abstract no.34246 * the whole document * ---	1,2,7,10	
A	PATENT ABSTRACTS OF JAPAN vol. 006 no. 198 (P-147) ,7 October 1982 & JP-A-57 108972 (NEC CORP) 7 July 1982, * abstract * -----	1,2,7,10	

TECHNICAL FIELDS SEARCHED (Int.Cl.5)
G06F
G06K

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
BERLIN	7 November 1995	Durand, J

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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T : theory or principle underlying the invention
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EPO FORM 1503 03.82 (P04C01)

OIPE JC46 JUL 15 2005 PATENT & TRADEMARK OFFICE

IFW

DOCKET NO.: IVOR-0005 **PATENT**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:
Edwin A. Suominen
Application No.: 11/088,032
Filing Date: March 22, 2005
Confirmation No.: Not Yet Assigned
Group Art Unit: Not Yet Assigned
Examiner: Not Yet Assigned
For: MESSAGE RECOGNITION USING SHARED LANGUAGE MODEL

DATE OF DEPOSIT: 7-13-05

I HEREBY CERTIFY THAT THIS PAPER IS BEING DEPOSITED WITH THE UNITED STATES POSTAL SERVICE AS FIRST CLASS MAIL, POSTAGE PREPAID, ON THE DATE INDICATED ABOVE AND IS ADDRESSED TO THE COMMISSIONER FOR PATENTS, P.O. BOX 1450, ALEXANDRIA, VA 22313-1450.

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ASSIGNEE POWER OF ATTORNEY

The undersigned, assignee of the entire interest in the above-identified application, hereby appoints the attorneys associated with the following customer number of the firm of WOODCOCK WASHBURN LLP, One Liberty Place - 46th Floor, Philadelphia, Pennsylvania, 19103, as attorneys for applicant(s), with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent and Trademark Office connected therewith.

23377

Send all future correspondence and address all telephone calls to:

Michael D. Stein
WOODCOCK WASHBURN LLP
One Liberty Place - 46th Floor
Philadelphia PA 19103
Telephone: (215) 568-3100

2005 WW

STATEMENT UNDER 37 CFR § 3.73(b)

Optical Research Partners LLC, a Nevada Limited Liability Company,

states that it is:

☒ the assignee of the entire right, title, and interest; or

☐ an assignee of an undivided part interest

in the patent application/patent identified above by virtue of either:

1. ☐ An assignment from the inventor of the patent application/patent identified above.

   ☐ 1. The assignment was recorded in the Patent and Trademark Office at Reel , Frame(s) .

OR

2. ☒ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as shown below:

   From: **Edwin A. Suominen** To: **Mount Hamilton Partners, LLC**
   The document was recorded in parent application 10/061,052 in the Patent and Trademark Office at Reel **016010**, Frame(s) **0010-0012**, or for which a copy thereof is attached.

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   ☐ Copies of assignments or other documents in the chain of title are attached.

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Signature
Name: **Julia Ceffalo**
Title: AUTHORIZED PERSON

Date: 30 JUNE 2005

2005WW

PTO/SB/05 (09-04)
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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	
First Inventor	Edwin A. Suominen
Title	Message Recognition Using Shared Language Model
Express Mail Label No.	ED 048542323 US

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. ☑ **Fee Transmittal Form** (e.g., PTO/SB/17)
   (Submit an original and a duplicate for fee processing)
2. ☑ **Applicant claims small entity status.** See 37 CFR 1.27.
3. ☑ **Specification** [*Total Pages* 81]
   Both the claims and abstract must start on a new page
   (For information on the preferred arrangement, see MPEP 608.01(a))
4. ☑ **Drawing(s)** (*35 U.S.C. 113*) [*Total Sheets* 17]
5. **Oath or Declaration** [*Total Sheets* 2]
   a. ☐ Newly executed (original or copy)
   b. ☑ A copy from a prior application (37 CFR 1.63(d))
   (for continuation/divisional with Box 18 completed)
   i. ☐ DELETION OF INVENTOR(S)
   Signed statement attached deleting inventor(s) name in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).
6. ☐ **Application Data Sheet.** See 37 CFR 1.76
7. ☐ **CD-ROM or CD-R** in duplicate, large table or Computer Program *(Appendix)*
   ☐ Landscape Table on CD
8. **Nucleotide and/or Amino Acid Sequence Submission**
   (if applicable, items a. – c. are required)
   a. ☐ Computer Readable Form (CRF)
   b. Specification Sequence Listing on:
      i. ☐ CD-ROM or CD-R (2 copies); or
      ii. ☐ Paper
   c. ☐ Statements verifying identity of above copies

ADDRESS TO: **Commissioner for Patents, P.O. Box 1450, Alexandria VA 22313-1450**

ACCOMPANYING APPLICATION PARTS

9. ☐ **Assignment Papers** (cover sheet & document(s))
   Name of Assignee _____
10. ☐ **37 CFR 3.73(b) Statement** *(when there is an assignee)* ☐ **Power of Attorney**
11. ☐ **English Translation Document** *(if applicable)*
12. ☐ **Information Disclosure Statement** (PTO/SB/08 or PTO-1449)
    ☐ Copies of citations attached
13. ☑ **Preliminary Amendment**
14. ☐ **Return Receipt Postcard** (MPEP 503)
    (*Should be specifically itemized*)
15. ☐ **Certified Copy of Priority Document(s)**
    (if foreign priority is claimed)
16. ☐ **Nonpublication Request** under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent.
17. ☐ Other: _____

18. If a CONTINUING APPLICATION, *check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.76:*

☑ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: 10/061,052

Prior application information: *Examiner* Armstrong, A. *Art Unit:* 2654

19. CORRESPONDENCE ADDRESS

☐ The address associated with Customer Number: _____ *OR* ☑ Correspondence address below

Name	Edwin A. Suominen				
Address	14614 N. Kierland Blvd. Suite 300				
City	Scottsdale	State	AZ	Zip Code	85254
Country	US	Telephone	480-948-3295	Fax	480-948-3387

Signature		Date	March 22, 2005
Name (Print/Type)	Edwin A. Suominen	Registration No. (Attorney/Agent)	43,174

This collection of information is required by 37 CFR 1.53(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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032205 1264 U.S. PTO

Effective on 12/08/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL For FY 2005

☑ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT	($)	500.00

Complete if Known	
Application Number	
Filing Date	March 22, 2005
First Named Inventor	Edwin A. Suominen
Examiner Name	
Art Unit	
Attorney Docket No.	

METHOD OF PAYMENT (check all that apply)

☑ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

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FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

Application Type	FILING FEES Fee ($)	FILING FEES Small Entity Fee ($)	SEARCH FEES Fee ($)	SEARCH FEES Small Entity Fee ($)	EXAMINATION FEES Fee ($)	EXAMINATION FEES Small Entity Fee ($)	Fees Paid ($)
Utility	300	150	500	250	200	100	500
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims	Extra Claims	Fee ($)	Fee Paid ($)
<20 - 20 or HP =	0	x _____	= 0

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims	Extra Claims	Fee ($)	Fee Paid ($)
<3 - 3 or HP =	0	x _____	= 0

HP = highest number of independent claims paid for, if greater than 3.

Multiple Dependent Claims Fee ($)	Multiple Dependent Claims Fee Paid ($)
_____	_____

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee ($)	Fee Paid ($)
98 - 100 =	0	/ 50 = 0 (round up to a whole number) x	_____	= 0

4. OTHER FEE(S)

	Fees Paid ($)
Non-English Specification, $130 fee (no small entity discount)	
Other (e.g., late filing surcharge): _____	

SUBMITTED BY

Signature		Registration No. (Attorney/Agent) 43,174	Telephone 480-948-3295
Name (Print/Type)	Edwin A. Suominen		Date March 22, 2005

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If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

TEXT PROCESSING SYSTEM

Inventor: Edwin A. Suominen

BACKGROUND OF THE INVENTION

Conventional computer workstations use a "desktop" interface to organize information on a single display screen. Users of such workstations may work with multiple documents on the desktop interface. However, many users find it more desirable to organize multiple documents on a work surface than to focus attention to multiple windows on a fixed display screen. A physical work surface is usually much larger than the screen display, and multiple documents may be placed on the surface for quick access and review. For many users, it is more natural and convenient to look for a desired document by visual inspection in a physical workspace than to click on one of a number of windows on a display screen. Because it is desirable to shift positions throughout a long workday, many users also prefer to physically pick up a document and review it in a reclining position instead of remaining in a fixed, upright seated position to review the document on a fixed display screen.

In an article entitled "The Computer for the 21st Century," which appeared in the September 1991 issue of *Scientific American*, Mark Weiser has proposed "electronic pads" that may be spread around on a desk like conventional paper documents. These pads are intended to be "scrap computers", analogous to scrap paper and having no individualized identity or importance. The pads can be picked up and used anywhere in the work environment to display an electronic document and receive freehand input with a stylus.

An article in the September 17, 1993 issue of *Science* included a further description of Weiser's ideas. In the article, electronic pads are characterized as thin note pads with a flat screen on top that a user could scribble on. The pads are intended to be as easy to use as paper. Instead of constantly opening and closing applications in the on-screen windows of a single desktop machine, a user could stack the pads around an office like paper and have all of them in use for various tasks at the same time.

The need has long been felt to generate text data (*e.g.*, character codes in a word processor) by voice input, and to integrate voice input with pen-based computers. An article headlined "Pen

ED 048542323 US

and Voice Unite" in the October 1993 issue of *Byte Magazine*, for example, describes a system for responding to alternating spoken and written input. In the system described, the use of pen and voice alternates as the user either speaks or writes to the system. The article states that using a pen to correct misrecognitions as they occur could make an otherwise tedious dictation system acceptable. According to the article, misrecognized words could be simply crossed out. The article suggests, however, that a system in which the use of pen and voice alternates as the user either speaks or writes to the system is less interesting than possibilities that could arise from simultaneous speech and writing.

The effectiveness and convenience of generating text data by voice input is directly proportional to the accuracy of the speech recognizer. Frequent misrecognitions make generation of text data tedious and slow. To minimize the frequency of misrecognitions, it is desirable to provide voice input of relatively high acoustic quality to the speech recognizer. A signal with high acoustic quality has relatively consistent reverberation and amplitude, and a high signal-to-noise ratio. Such quality is conventionally obtained by receiving voice input via a headset microphone. By being mounted on a headset, a microphone may be mounted at a close, fixed proximity to the mouth of a person dictating voice input and thus receive voice input of relatively high acoustic quality.

Head mounted headsets have long been viewed with disfavor for use with speech recognition systems, however. In a 1993 article entitled "From Desktop Audio to Mobile Access: Opportunities for Voice in Computing," Christopher Schmandt of MIT's Media Laboratory concludes that "obtaining high-quality speech recognition without encumbering the user with head mounted microphones is an open challenge which must be met before recognition will be accepted for widespread use." In the November 7, 1994 issue of *Government Computer News,* an IBM marketing executive in charge of IBM speech and pen products is quoted as saying that, *inter alia*, a way must be found to eliminate head-mounted microphones before natural-language computers become pervasive. The executive is further quoted as saying that the headset is one of the biggest inhibitors to the acceptance of voice input.

Being tethered to a headset is especially inconvenient when the user needs to frequently walk away from the computer. Even a cordless headset can be inconvenient. Users may feel self-conscious about wearing such a headset while performing tasks away from the computer.

The long felt need for a system incorporating speech recognition capability with pen-based computers has remained largely unfulfilled. Such a system presents conflicting requirements for high acoustic quality and freedom of movement. Pen-based computers are often used in collaborative environments having high ambient noise and extraneous speech. In such environments, the user may be an engaging in dialogue and gesturing in addition to dictation. Although a headset-mounted microphone would maintain acoustic quality in such situations, the headset is inconsistent with the freedom of movement desired by users of pen-based computers.

It has long been known to incorporate a microphone into a stylus for the acquisition of high-quality speech in a pen-based computer system. For example, the June 1992 edition of IBM's *Technical Disclosure Bulletin* discloses such a system, stating that speech is a way of getting information into a computer, either for controlling the computer or for storing and/or transmitting the speech in digitized form. However, the *Bulletin* states that such a system is not intended for applications where speech and pen input are required simultaneously or in rapid alteration.

IBM's European patent application EP 622724, published in 1994, discloses a microphone in a stylus for providing speech data to a pen-based computer system, which can be recognized by suitable voice recognition programs, to produce operational data and control information to the application programs running in the computer system. *See*, for example, column 18, lines 35-40 of EP 622724. Speech data output from the microphone and received at the disclosed pen-based computer system can be converted into operational data and control information by a suitable voice recognition program in the system.

To provide an example of a "suitable voice recognition program," the EP 622724 application refers to U.S. Patent Application 07/968,097, which matured into U.S. patent 5,425,129 to Garman. At column 1, lines 54-56, the '129 patent states the object of providing a speech recognition system with word spotting capability, which allows the detection of indicated words or phrases in the presence of unrelated phonetic data.

Due to the shortcomings of available references such as the aforementioned June 1992 IBM *Technical Disclosure Bulletin*, EP 622724 European application, and 07/968,097 U.S. application, the need remains to integrate high-quality voice input for dictation with pen-based computers. This need is especially unfulfilled for a system that includes voice dictation capability with a number of electronic pads. Such a system would need to maintain acoustic

quality while providing voice input to a desired one of the pads, which are spread out on a work surface, possibly in a noisy collaborative environment, at varying distances from the source of voice input.

The need also remains for a speech recognizer that may be automatically activated when voice input is desired. U.S. patent 5,857,172 to Rozak, for example, identifies a difficulty encountered with conventional speech recognizers in that such speech recognizers are either always listening and processing input or not listening. When such a speech recognizer is active and listening, all audio input is processed, even undesired audio input in the form of background noise and inadvertent comments by a speaker. As discussed above, such undesired audio input may be expected to be especially problematic in collaborative environments where pen-based computers are often used. The '172 patent discloses a manual activation system having a designated hot region on a video display for activating the speech recognizer. Using this manual system, the user activates the speech recognizer by positioning a cursor within the hot region. It would be desirable however, for a speech recognizer to be automatically activated without the need for a specific selection action by the user.

Speech recognition may be viewed as one possible subset of message recognition. As defined in Merriam-Webster's *WWWebster Dictionary* (Internet edition), a message is "a communication in writing, in speech, or by signals." U.S. Patent 5,502,774, issued March 26, 1996 to Bellegarda discloses a "message recognition system" using both speech and handwriting as complementary sources of information. Speech recognizers and handwriting recognizers are both examples of message recognizers.

A need remains for message recognition with high accuracy. Misrecognitions by conventional message recognizers, when frequent, make generation of text data tedious and slow. Conventional language, acoustic, and handwriting models respond to user training (*e.g.*, corrections of misrecognized words) to adapt and improve recognition with continued use.

In conventional message recognition systems, user training is tied to a specific computer system (*e.g.*, hardware and software). Such training adapts language, acoustic, and/or handwriting models that reside in data storage of the specific computer system. The adapted models may be manually transferred to a separate computer system, for example, by copying files to a magnetic storage medium. The inconvenience of such a manual operation limits the

portability of models in a conventional speech recognition system. Consequently, a user of a second computer system is often forced to duplicate training that was performed on a first computer system. In addition, rapid obsolescence of computer hardware and software often renders adapts language, acoustic, and/or handwriting models unusable after the user has invested a significant amount of time to adapt those models.

Conventionally, user training is also tied to a specific type of message recognizer. Correction of misrecognized words typically improves only the accuracy of the particular type of message recognizer being corrected. U.S. Patent 5,502,774 to Bellegarda discloses a multi-source message recognizer that includes both a speech recognizer and a handwriting recognizer. The '774 patent briefly states, at column 4, lines 54-58, that the training of respective source parameters for speech and handwriting recognizers may be done globally using weighted sum formulae of likelihood scores with weighted coefficients. However, the need remains for a multi-source message recognizer that can apply user correction to appropriately perform training for multiple types of recognition, by applying the correction of a message misrecognition only to those models employed in the type of message recognition to which the training is directly relevant.

Conventional message recognition systems include a language model and a type-specific model (*e.g.*, acoustic or handwriting). As discussed in U.S. patent 5,839,106, issued November 17, 1998 to Bellegarda, conventional language models rely upon the classic N-gram paradigm to define the probability of occurrence, within a spoken vocabulary, of all possible sequences of N words. Given a language model consisting of a set of *a priori* N-gram probabilities, a conventional speech recognition system can define a "most likely" linguistic output message based on acoustic input signal. As the '106 patent points out, however, the N-gram paradigm does not contemplate word meaning, and limits on available processing and memory resources preclude the use of models in which N is made large enough to incorporate global language constraints. Accordingly, models based purely on the N-gram paradigm can utilize only limited information about the context of words to enhance recognition accuracy.

Semantic approaches to language modeling have been disclosed. Generally speaking, such techniques attempt to capture meaningful word associations within a more global language context. For example, U.S. patent 5,828,999, issued October 27, 1998 to Bellegarda *et al.*

discloses a large-span semantic language model which maps words from a vocabulary into a vector space. After the words are mapped into the space, vectors representing the words are clustered into a set of clusters, where each cluster represents a semantic event. After clustering the vectors, a first probability that a first word will occur (given a history of prior words) is computed. The probability is computed by calculating a second probability that the vector representing the first word belongs to each of the clusters; calculating a third probability of each cluster occurring in a history of prior words; and weighting the second probability by the third probability.

The '106 patent discloses a hybrid language model that is developed using an integrated paradigm in which latent semantic analysis is combined with, and subordinated to, a conventional N-gram paradigm. The integrated paradigm provides an estimate of the likelihood that a word, chosen from an underlying vocabulary, will occur given a prevailing contextual history.

A prevailing contextual history may be a useful guide for performing general semantic analysis based on a user's general writing style. However, a specific context of a particular document may be determined only after enough words have been generated in that document to create a specific contextual history for the document. In addition, the characterization of a contextual history by a machine may itself be inaccurate. For effective semantic analysis, the need remains for accurate and early identification of context.

BRIEF DESCRIPTION OF THE DRAWING

Embodiments of the present invention are described below with reference to the drawing, wherein like designations denote like elements, and:

FIGS. 1A and 1B are, respectively, a functional block diagram and simplified pictorial view of a single-tablet system responsive to freehand input and voice input, according to various aspects of the present invention;

FIG. 2 is a combination block diagram and simplified pictorial view of a multiple-tablet system responsive to freehand input and voice input, according to various aspects of the present invention;

FIG. 3A is a functional block diagram of a domain controller in the system of FIG. 2;

FIG. 3B is a functional block diagram of a message model in the domain controller of FIG. 3A;

FIG. 4 is a data flow diagram of the operation of a stylus according to various aspects of the present invention;

FIG. 5 is a data flow diagram of the operation of the domain controller of FIG. 3A in cooperation with the stylus of FIG. 4;

FIG. 6A is a functional and simplified schematic block diagram of a stylus that includes an activation circuit having an infrared radiation sensor responsive to infrared field radiation according to various aspects of the present invention;

FIG. 6B is a simplified pictorial view illustrating operation of the activation circuit in the stylus of FIG. 6A;

FIG. 7A is a functional and simplified schematic block diagram of a stylus that includes an activation circuit having an acoustic radiation sensor and ultrasonic transmitter according to various aspects of the present invention;

FIG. 7B is a simplified pictorial view illustrating operation of the activation circuit in the stylus of FIG. 7A;

FIG. 8, including FIGS. 8A through 8D, is a timing diagram of signals provided by a stylus according to various aspects of the present invention;

FIG. 9 is a diagram of relationships among various models of a message model according to various aspects of the present invention;

FIG. 10 is a flow diagram of a method for the identification of semantic clusters according to various aspects of the present invention;

FIG. 11 is a flow diagram of a process for analyzing semantic clusters of a training corpus according to various aspects of the present invention;

FIG. 12 illustrates a partial example of a data structure tabulating probabilities computed in the method of FIG. 10;

FIG. 13 is a flow diagram of a method for adapting a semantic model by user identification of context according to various aspects of the present invention;

FIG. 14 is a flow diagram of a method for adapting a syntactic model by user correction of misrecognition according to various aspects of the present invention; and

FIGS. 15A and 15B are planar views of respective tablets displaying respective views of a document according to various aspects of the present invention.

DESCRIPTION OF PREFERRED EXEMPLARY EMBODIMENTS

A text processing system according to various aspects of the present invention may be responsive to both voice input and freehand input to generate and edit text data. Text data is any indicia of text that may be stored and conveyed numerically. For example, text data may be numerical codes used in a computer to represent individual units (*e.g.*, characters, words, kanji) of text. Voice input may be used primarily to generate text data, while freehand input may be used primarily to edit text data generated by voice input. For example, system 100 of FIG. 1 (including FIGS. 1A and 1B) suitably includes a stylus 110 responsive to voice input and a tablet 150 responsive to freehand input, coupled together via a communications link 115.

A tablet according to various aspects of the present invention includes any suitable hardware and/or software for performing functions of, *inter alia*, a speech recognizer and an editor. Tablet 150, for example, may include a conventional CPU and memory (not shown) having indicia of suitable software instructions for the CPU to implement tablet interface 164, speech recognizer 162, and editor 168. Tablet 150 may further include suitable conventional hardware (*e.g.*, "glue logic," display driving circuitry, battery power supply, etc.) and/or software (*e.g.*, operating system, handwriting recognition engine, etc.).

Tablet 150 may be an "electronic book" type of portable computer having a tablet surface and a display integrated into the tablet surface. Such a computer may include hardware and software of the type disclosed in U.S. Patent 5,602,516, issued September 1, 1998 to Shwarts *et al.*, and U.S. Patent 5,903,668, issued May 11, 1999 to Beernink. The detailed description portion (including referenced drawing figures) of each of these two aforementioned patents is incorporated herein by reference. Further, the detailed description portion (including referenced drawing figures) of any U.S. patent or U.S. patent application incorporated by reference into either of these two aforementioned patents is also specifically incorporated herein by reference.

Functional blocks implemented by hardware and/or software in tablet 150 include: tablet interface 164 for receiving freehand input communicated via pointer 610 of stylus 110; receiver 160 for receiving (indirectly) voice input communicated via microphone 120 of stylus 110; speech recognizer 162 for generating text data responsive to the voice input; and editor 168. In FIG. 2 and also in FIGS. 3A and 3B (discussed below), interconnection between functional blocks is depicted by single lines. Such lines represent transfer of data by any suitable hardware or software interconnection, including, for example, the transfer of memory contents between software objects instantiated in a single processing environment.

Microphone 120 couples voice input from stylus 110 to speech recognizer 162 via transmitter 122 and receiver 160. Transmitter 122 is coupled to receiver 160 via communications link 115. Speech recognizer 162 generates text data responsive to voice input from user 240 and provides the text data to editor 168. Tablet interface 164 interprets editing commands responsive to freehand input and provides indicia of the editing commands to editor 168. Editor 168 performs any modifications to the text data that are suitably specified by the editing commands. Speech recognizer 162, tablet interface 164, and editor 168 are described in greater detail below.

According to various aspects of the present invention, a communications link may employ any suitable medium, modulation format, and/or communications protocol to convey information from transmitter in a stylus to a receiver in, for example, a table. A communications link may use a wired (*i.e.*, physical) connection, or a wireless connection through modulated field radiation. Field radiation includes acoustic radiation and electromagnetic radiation in the radio, infrared, or visible light spectrum. For example, communications link 115 uses modulated radio transmission to convey information from transmitter 122 to receiver 160.

A transmitter according to various aspects of present invention includes any suitable hardware and/or software for transmitting voice input via a communications link 115. When a simple wired connection is utilized for a communications link, no transmitter may be needed. When a wireless connection is utilized, a transmitter may include appropriate conversion, modulation, and/or transmission circuitry. For example, transmitter 122 in stylus 110 includes a conventional analog-to-digital converter for converting voice input into digital samples, and a conventional modulator/transmitter for converting the digital samples into an analog signal

having a desired modulation format (*e.g.*, FSK, QPSK). A transmitter may be coupled to a radiating device for converting the analog signal into a desired form of field radiation (*e.g.*, an RF signal in the 1-5 GHz range). For example, transmitter 122 couples an RF signal to a conventional dipole antenna having elements 660, which are oriented parallel to a longitudinal axis of stylus 110. As a further example, infrared transmitter 760 in stylus 710 couples digital modulation to a conventional solid state infrared emitter 770. Emitter 770 produces modulated infrared radiation, which passes out of stylus 710 through transparent aperture 775.

A receiver according to various aspects of present invention includes any suitable hardware and/or software for receiving information from a transmitter via a communications link. When a simple wired connection is utilized for a communications link, a receiver may consist of a circuit for amplifying and/or filtering the signal from a microphone. When a wireless connection is utilized, a receiver may include appropriate receiving, demodulation, and conversion circuitry, generally complementary to circuitry in a cooperating transmitter. For example, receiver 160 of tablet 150 includes a conventional receiver/demodulator for converting an analog signal transmitted by transmitter 122 and picked up by a suitable sensing device (*e.g.*, an antenna, not shown).

In a variation, a communications link may be of the type disclosed in U.S. Patent 4,969,180 issued November 6, 1990 to Watterson *et al.*, The disclosure found from column 5, line 19 through column 14, line 55 of the aforementioned patent, including drawing figures referenced therein, is incorporated herein by reference. In such a variation, an analog ultrasonic signal is employed in a communications link.

A stylus according to various aspects of the present invention includes any device having a pointer for conveying freehand input to a tablet interface. A pointer may be a portion of one end of a stylus that is suitably narrow for a user to convey freehand input (*e.g.*, gestures, editing commands, and handwriting). Typically, a pointer is a tapered portion toward the distal (*i.e.*, downward, in operation) end of a stylus. As may be better understood with reference to FIG. 6A, for example, stylus 110 includes a tapered pointer 610, which a user 240 may manually manipulate on or near surface 152 of tablet 150 to convey freehand input. As may be better understood with reference to FIG. 1A, exemplary stylus 110 further includes: a microphone 120; a proximity sensor 124; an activation circuit 126; an identification circuit 128; a transmitter 122;

control circuitry (not shown) such as a programmable logic device and/or a microcontroller; and suitable supporting hardware (*e.g.*, battery power supply).

By permitting alternating speech and pen input using stylus 110, text processing system 100 provides speech recognition with improved accuracy and editing convenience. To generate text by dictation, user 240 moves stylus 110 toward his or her mouth and begins speaking into microphone 120. To edit text, user 240 moves stylus 110 to tablet surface 152 and manually manipulates pointer 610 on surface 152. User 240 need not be tethered to a head-mounted microphone; he or she already has microphone 120 in hand when grasping stylus 110. When positioned near the mouth of user 240, microphone 120 is typically able to receive high quality voice input comparable to that received by a head-mounted microphone.

When employed for generating an editing an electronic document, tablet 150 may be used as an alternative to a paper document and can be expected to be positioned near the head of user 240. When tablet 150 is positioned for comfortable use, for example resting on the thigh portion of a crossed leg of user 240, the distance between tablet surface 152 and the head of user 240 may be only about twice the length of stylus 110. In such a configuration, alternating speech and freehand input using stylus 110 can be expected to be natural and intuitive. User 240 may find it natural and intuitive to move stylus 110 away from tablet surface 152, and toward his or her mouth, while reviewing displayed text and preparing to generate additional text by dictation. No significant change in the orientation of stylus 110 is necessary because microphone 120 typically remains aimed toward the mouth of user 240. User 240 may also find it natural and intuitive to edit the text he or she has generated, or to correct misrecognized dictation, by simply moving stylus 110 toward and onto tablet surface 152 to manipulate pointer 610 on surface 152.

Preferably, microphone 120 is disposed toward the proximal (*i.e.*, upward in operation) end of stylus 110 and is at least somewhat directional to improve quality of voice input when pointed toward the mouth of user 240. When directional, microphone 120 is responsive to sound impinging on stylus 110 from the direction of its proximal end with a greater sensitivity than from its distal end.

A stylus may include a proximity sensor and an activation circuit for activating a speech recognizer when the stylus is proximate a human head. A stylus may also include (alternatively or additionally) an identification circuit for identifying the owner of the stylus, for example to

permit selection of an appropriate user message model, as described below. Exemplary stylus 110 further includes: proximity sensor 124; activation circuit 126; and identification circuit 128.

An activation circuit according to various aspects of the present invention includes any circuit housed in a stylus for activating speech recognition when the stylus is situated to receive voice input. Such a circuit may determine that the stylus is situated to receive voice input by sensing one or more conditions. Such conditions include, for example, the amplitude or angle of impingement of sound waves from the voice input and the proximity (*i.e.*, displacement and/or orientation) of the stylus with respect to the head of a user providing the voice input.

An activation circuit may employ any conventional selection or control system to activate speech recognition. In system 100, for example, activation circuit 126 provides a binary activation signal S_A to transmitter 122 while microphone 120 provides transmitter 122 an analog voice signal S_V. Transmitter 122 continuously conveys both activation signal S_A and voice signal S_V to receiver 160. Activation signal S_A includes an activation bit that is set to a true state by activation circuit 126 to activate speech recognition. Receiver 160 may be configured to convey voice signal S_V to speech recognizer 162 only when the activation bit is set to a true state. In a variation, speech recognizer 162 may be configured to generate text responsive to voice input only when the activation bit is in a true state. In another possible variation, activation signal S_A may selectively control the transmission of voice signal S_V by transmitter 122.

An activation circuit that senses angle of impingement of sound waves as a condition for activation may include a plurality (*e.g.*, two) of sound sensors that are responsive to sound impinging on the stylus from a plurality of respective angular ranges. Such a circuit also includes a comparator for comparing the amplitudes of sound from the sound sensors. When the relative amplitude indicates that the voice input is impinging on the stylus from within a predetermined angular range, the comparator makes a positive determination that causes activation of speech recognition.

When such an activation circuit is used, the function of a microphone may be easily incorporated into one of the sound sensors. Consequently, it may not be necessary for a stylus employing such an activation circuit to include a separate microphone. The activation circuit may include circuitry of the type disclosed in U.S. Patent 4,489,442, issued December 18, 1984 to Anderson *et al.* The disclosure found from column 2, line 42 through column 11, line 29 of

this aforementioned patent, including drawing figures referenced therein, is incorporated herein by reference.

As may be better understood with reference to FIGS. 1A and 6A, activation circuit 126 is a preferred example of an activation circuit that senses proximity of stylus 110 with respect to the head of a user 240 providing voice input. Activation circuit 126 includes a proximity sensor 124.

A proximity sensor includes any device positioned proximate a microphone in a stylus, according to various aspects of the present invention, such that is able to sense proximity of a human head to the microphone. A proximity sensor may include a radiation sensor responsive to field radiation impinging on the stylus from a human head. For example, proximity sensor 124 includes radiation sensor 615. Alternatively, a proximity sensor may be a capacitive proximity sensor of the type disclosed in U.S. Patent 5,337,353, issued August 9, 1994 to Boie *et al.* The detailed description portion (including referenced drawing figures) of this aforementioned patent is incorporated herein by reference.

A radiation sensor according to various aspects of the present invention includes any device responsive to field radiation impinging on the stylus. As discussed above, field radiation includes acoustic radiation and electromagnetic radiation in the radio, infrared, or visible light spectrum. For example, radiation sensor 615 includes two infrared sensors 620 and 630. Sensors 620 and 630 provide respective sensing signals S1 and S2 with amplitudes proportional to the respective amounts of infrared field radiation sensed. Sensor 620 is positioned at the end of a wide aperture cone 622 such that it is responsive to infrared radiation impinging on stylus 110 within a wide angular range AR1. Sensor 630 is positioned at the end of a narrow aperture cone 632, behind sensor 620, such that it is responsive to infrared radiation impinging on stylus 110 within a narrow angular range AR2.

Proximity sensor 124 further includes a comparator 640 for comparing sensing signals S1 and S2. A comparator according various aspects of the present invention includes any circuit for making a determination that a stylus is situated to receive voice input based on one or more suitable conditions of signals provided by sensors. A comparator may perform mathematical functions on such signals, as well as any time-domain processing of the signals that may be desired to establish that the stylus has been properly situated for a given period of time. For example, comparator 640 performs subtraction and division operations to compute a residual

portion SR of signal S1 that is uniquely attributable to sensor 620. Comparator 640 also performs comparisons of residual portion SR and signal S2 to two predetermined thresholds T_1 and T_2, respectively. Comparator 640 thus makes a determination that stylus 110 is situated to receive voice input based on two conditions, which may be mathematically expressed as follows:

$$Condition\ \ A:\ \ S2 \geq T_1$$

$$Condition\ \ B:\ \ \frac{S2}{S2-S1} \geq T_2$$

When microphone 120 is at a desired proximity to the head of user 240, infrared radiation from the head of user 240 occupies most of angular range AR2. Sensor 630 collects a predetermined amount of infrared radiation, which causes the amplitude of signal S2 to reach the first predetermined threshold (condition A). At the desired proximity, infrared radiation from the head of user 240 occupies only that part of angular range AR1 also occupied by range AR2. The residual portion of signal S1 is thus relatively small, which causes the ratio between signal S2 and the residual portion to reach the second predetermined threshold (condition B).

It is possible for stylus 110 to be situated such that microphone 120 is displaced from the head of user 240 within a desired separation range but oriented away from the head (*i.e.*, having an orientation outside the desired angular range). When stylus 110 is so situated, sensor 630 may be close enough to the head to permit the amplitude of signal S2 to reach the first predetermined threshold (condition A) even though infrared radiation from the head only occupies a portion of angular range AR2. However, the residual portion of signal S1 will then be relatively large because a significant portion of the infrared radiation falls within angular range AR1 but outside range AR2. Consequently, the ratio between signal S1 and the residual portion will fall short of the second predetermined threshold and condition B will not be met.

In a variation, an infrared proximity sensor may be suitably adapted from the disclosure of U.S. Patent 5,330,226 issued July 19, 1994 to Gentry *et al.* The detailed description portion (including referenced drawing figures) of this aforementioned patent is incorporated herein by reference.

A proximity sensor according various aspects of a present invention may include a radiation sensor that is responsive to acoustic field radiation. For example, stylus 710 of FIG. 7A includes

a microphone 720 and an ultrasonic activation circuit 725, which suitably includes: an ultrasonic radiation transmitter/sensor 740; a signal processor 745; and a comparator 750. Transmitter/sensor 740 emits an ultrasonic (*e.g.*, having a center frequency of 50 kHz) pulse of acoustic field radiation from piezoelectric transducer 730. The radiation travels toward the head of user 780 and multiple echoes (depicted as E1, E2, and E3 for illustrative purposes) of the radiation reflect from its surface. Portions of the echoes return to transducer 730 where they are sensed over an interval to form a time-varying signal that is coupled to transmitter/sensor 740.

Transmitter/sensor 740 converts the time-varying signal to a suitable form (*e.g.*, Nyquist filtered discrete-time samples) and conveys the converted signal to signal processor 745. Signal processor 745 provides a distance profile of the sensed acoustic field radiation.

A distance profile is a characterization of the respective distances between an ultrasonic transducer and a scattering object that reflects echoes back to the transducer. For example, a distance profile may be a mathematical curve characterizing a sequential series of discrete-time samples. Each sample may represent amplitude of echoes received at a specific point within a time interval. Such a curve may be characterized by a width of the most prominent peak in the curve and a "center of mass" of the curve T_{cm}, which may be calculated as follows:

$$T_{cm} = \frac{\int_0^T t\, f(t)dt}{\int_0^T f(t)dt}$$

The center of mass of a distance profile curve moves to the left (*i.e.*, closer to $t = 0$) as the scattering object moves closer to the transducer, and to the right as the scattering object moves away. Such a curve has a pronounced peak if the scattering object is relatively flat (*e.g.*, a wall), because all echoes are received at about the same time. Scattering objects having irregular surfaces provide distance profile curves that are relatively distributed and irregular because echoes from different portions of the surface are received at different times and with varying amplitudes. A scattering object having a distinct surface shape (*e.g.*, a human face) can be expected to provide a distinct distance profile curve.

Comparator 750 compares the distance profile from signal processor 745 to an expected profile. The expected profile corresponds to acoustic field radiation expected to impinge on

transducer 730 of stylus 710 when microphone 720 is at a predetermined proximity to the head of user 780. The expected profile may be a curve formed from a sequential series of predetermined data values, each representing the expected amplitude of echoes received at a specific point within a time interval. Alternatively, the expected profile may simply be a collection of statistics (*e.g.*, center of mass and peak width) characterizing the expected distance profile when microphone 720 is at a predetermined proximity to the head of user 780. The distance profile may be compared to the expected profile by any suitable signal processing technique (*e.g.*, comparison of statistics or cross-correlation of data points).

A suitable expected profile may be generated by situating stylus 710 such that microphone 720 is at a desired proximity to the head of user 780. Then a programming mode may be entered by suitable user control (*e.g.*, depressing a button on the body of stylus 710) at which point the distance profile is recorded or statistically characterized. The recorded or characterized distance profile then becomes the expected profile, which may be employed for subsequent operation of stylus 710. A single expected profile (or a statistical aggregate using heads of multiple people as scattering objects) may be pre-programmed into multiple production copies of stylus 710.

In a variation, an ultrasonic proximity sensor may be suitably adapted from the disclosure of U.S. Patent 5,848,802 issued December 15, 1998 to Breed *et al.* The detailed description portion (including referenced drawing figures) of this aforementioned patent is incorporated herein by reference.

An identification circuit according to various aspects of the present invention includes any circuit housed in a stylus for identifying the stylus. Such a circuit may provide an identification signal that identifies an owner of the stylus by any suitable descriptive or uniquely characteristic content (*e.g.*, a digital code). A few examples of suitable identification circuits and identification signals that may be provided by such circuits are provided in TABLE I below.

TABLE I

Identification Circuit	Corresponding Identification Signal For Identifying Stylus
Microcontroller (possibly shared with transmitter and/or activation circuit)	Numeric or alphanumeric code, provided either periodically or upon request.
Dedicated non-volatile memory device (*e.g.*, 4-pin serial PROM)	Binary code (*e.g.*, 48-bit serial bitstream) provided upon request of control circuitry or transmitter.
Programmable logic device (possibly shared with transmitter and/or activation circuit)	Binary code (*e.g.*, 48-bit serial bitstream) provided either periodically or upon request.
Analog periodic signal source	Periodic modulation of signal from transmitter (*e.g.*, with one or more subcarriers containing characteristic periodic behavior or digitally modulated identification)

In system 100 (FIG. 1A), identification circuit 128 is a four-pin serial PROM that identifies stylus 110 by providing, upon request by suitable controlling circuitry (not shown), identification signal S_{ID} as a 48-bit serial word to transmitter 122. Transmitter 122 incorporates identification signal S_{ID} with voice signal S_V from microphone 120 and transmits the combined signals to receiver 160 via communications link 115.

Depending on the type of identification circuit employed, a predetermined identification signal may be assigned during or after device fabrication. For example, identification circuit 128 is programmed to provide a 48-bit serial identification signal before being soldered to a printed circuit board along with other components of stylus 110. When a microcontroller is employed for control circuitry in stylus 110, the function of identification circuit 128 may be performed by the microcontroller. Dedicated circuitry for identification circuit 128 is not necessary in such a configuration. A microcontroller-based identification circuit may be programmed after device fabrication as desired, possibly many times. Conventional interface circuitry (*e.g.*, magnetic

sensor and cooperating receiver, miniature 3-pin connector and serial port) may be provided to facilitate such programming.

When personalized with an identification circuit, a stylus may be carried about by a user and treated as a personal accessory. For example, a stylus may be shaped and dimensioned to have a look and feel similar to that of a high quality pen. If desired, such a stylus and pen may be packaged and carried about by a user as a complementary set. A personalized stylus may include personalizing indicia on its outer surface such as a monogram or logo.

By facilitating identification, stylus 110 may be used in particularly advantageous applications. In system 200, for example, stylus 110 may be owned by a particular user and used with a tablet that is shared with a number of users. (The structure and operation of system 200 is discussed in greater detail below with reference to FIGS. 2-5.) As exemplified in system 200, a speech recognizer and/or handwriting recognizer may be responsive to identifying signal S_{ID} to select a particular user message model to use when generating text responsive to voice input conveyed via stylus 110. In a collaborative environment, an identification circuit may also enable text data generated by a particular user to be "stamped" with the user's identity. Text may be "stamped," for example, by displaying the text data in a particular color or with a hidden identifier that may be displayed upon user selection.

A user message model is a message model that is specific to a particular user. As discussed in greater detail below, a message model is a model used in recognition of a message. A message is any communication in writing, in speech, or by signals. A message model may include a language model as well as an acoustic and/or handwriting model.

A stylus having an identification circuit may be associated with a user by a suitable registration system. For example, a user may select an identification signal to program into the identification circuit. Alternatively, a registration system may assign an identification signal to the user, and an associate the user with that predetermined identification signal. When stylus 110 is assigned (*e.g.*, sold, loaned by an employer, etc.) to a user, for example, the user may register personal information for association with the predetermined identification signal. Such personal information may include the user's name and security authorizations, and the location (*e.g.*, Internet address) of the appropriate user message model on a wide area network.

Transmission of voice signal S_V, identification signal S_{ID}, and activation signal S_A from stylus 110 to tablet 150 may be better understood with reference to FIG 8 (including FIGS. 8A-8D). In system 100, these signals are transmitted via communications link 115 as bursts of serial data. Each burst includes header bits and data bits. The header bits of any given bursts identify that burst as a portion of either signal S_V, S_{ID}, or S_A. In system 100, two header bits are used to distinguish the three signals. The data bits convey signals S_V, S_{ID}, or S_A as serial data. In system 100, voice signal S_V is conveyed with bursts of 16 data bits and identification signal S_{ID} is conveyed with bursts of 48 data bits. Activation signal S_A of system 100 is conveyed with a single data bit that indicates either an "activate" command or an "inactivate" command. Alternately, a standard number of data bits may be used, with unused bits left unspecified or in a default state.

In the time span depicted in FIG. 8, identification signal S_{ID} is asserted one time in burst 810. Signal S_{ID} may be asserted at a relatively low rate of repetition (*e.g.*, once every second), just often enough to be able to signal a newly used tablet of the identity of stylus 110 without perceptible delay by the user. In a variation, receiving circuitry (not shown) may be included in stylus 110 so that a new tablet may indicate its presence to stylus 110 and signal the need for a new assertion (*i.e.*, serial burst) of identification signal S_{ID}. In system 100, signal S_{ID} is conveyed with a large data word length (48 bits) to permit a large number (*e.g.*, 2^{32}) of pre-certified identification signals to be asserted with an even larger number (*e.g.*, $2^{48} - 2^{32}$) of invalid identification signals possible using random bit sequences. Consequently, stylus 110 may use signal S_{ID} to validate secured access to tablet 150. Signal S_{ID} may also be used as an encryption key, for example to facilitate secured transmission of a user message model on a wide area network. In identification circuits where security is not a concern, shorter word lengths (*e.g.*, 24 bits) may be used for an identification signal.

Voice signal S_V is asserted at regular intervals, for example in periodic bursts 820-825 of FIG. 8B. Signal S_V is comprised of periodic samples, which may be provided by a conventional A/D converter (not shown) at any desired point in the signal path from microphone 120 through transmitter 122. The A/D converter may be preceded by a suitable anti-aliasing filter (also not shown). If a delta-sigma A/D converter is used, only a single-pole RC anti-aliasing filter is needed. In system 100, signal S_V is a serial bitstream having bursts 820, 821, 822, 823, 824, and 825 of 16-bit samples, which are provided at a 8 kHz sample rate.

Activation signal S_A is asserted once, as burst 830, in the time span depicted in FIG. 8. Signal S_A may be asserted, with appropriate coding, whenever a change in the activation of speech recognition is desired. Signal S_A may be asserted with an "activate" code when stylus 110 initially becomes situated to receive voice input. For example, activation circuit 126 may so assert signal S_A when user 240 brings stylus 110 toward his or her mouth to begin generating text by voice input. Signal S_A may be again asserted (this time with an "inactivate" code) when stylus 110 is no longer situated to receive voice input. For example, activation circuit 126 may so assert signal S_A when user 240 moves stylus 110 away from his or her mouth and toward tablet 150 to begin editing text by freehand input. In system 100, signal S_A is a serial bitstream with bursts 830 having a single data bit, plus the two header bits.

Signals S_V, S_{ID}, and S_A are combined into a single signal 840. As may be better understood with reference to FIG. 8D, data bursts in signal 840 do not have identical timing to corresponding bursts in originating signals S_V, S_{ID}, and S_A. Bursts 820-825 from signal S_V do not need to be transmitted at constant intervals. Bursts 820-825 are merely numeric representations of signal samples that have been acquired and digitized at constant intervals. Bursts 820-825 need only to be transmitted at the same mean rate as the rate at which the signal samples were acquired. Speech recognizer 162 may process a series of digital samples (each conveyed by a respective data burst) for processing without concern for exactly when the samples were transmitted in digital form. In the event that timing of the digital samples is a concern, sample buffering (*e.g.*, using a FIFO) may be incorporated in receiver 160 to ensure that samples are passed along to speech recognizer 162 at substantially constant intervals.

Burst 810 from signal S_{ID} is passed on signal 840 as soon as it has been completed. Activation signal S_A takes high priority because it determines whether or not bursts from voice signal S_V are responded to. Consequently, burst 830 from signal S_A is passed on signal 840 immediately after burst 810, even though two bursts 821 and 822 of voice signal S_V are ready to be passed on as well. Bursts 821 and 822 are sent immediately after bursts 830, followed immediately by additional bursts 823, 824, and 825 from signal S_V.

In system 100, signal 840 is modulated into an electromagnetic signal suitable for transmission by transmitter 122. Receiver 160 demodulates the signal to provide signals

corresponding to signals S_V, S_{ID}, and S_A to speech recognizer 162. Receiver 160 may also provide some or all of these signals to other portions of tablet 150, as desired.

A tablet interface according to various aspects of the present invention (*e.g.*, tablet interface 164) includes (1) any tablet surface on which a stylus pointer may be manually manipulated and (2) suitable cooperating hardware (*e.g.*, stylus position indicator) and/or software (*e.g.*, for implementing handwriting recognition) that is responsive to freehand input communicated via the pointer. Any conventional tablet surface may be used, including, for example, a position sensitive membrane or an array of ultrasonic receivers for triangulating the position of a stylus pointer having a cooperating ultrasonic transmitter.

A tablet interface and stylus may include cooperating circuitry of the type disclosed in U.S. Patent 5,007,085, issued April 9, 1991 to Greanias *et al.* The detailed description portion (including referenced drawing figures) of this aforementioned patent is incorporated herein by reference. Further, the detailed description portion (including referenced drawing figures) of any U.S. patent or U.S. patent application incorporated by reference into this aforementioned patent is also specifically incorporated herein by reference.

Preferably, a conventional flat-panel display is integrated into the tablet surface. Such an integrated configuration is advantageous because, *inter alia*, visible "ink" may be displayed to show freehand input as if the stylus pointer were the actual tip of a pen. A display according to various aspects of the present invention may employ any conventional technology such as LCD. It is contemplated that newer display technologies such as IBM's "Roentgen," using aluminum and copper display materials, and "reversible paper" (*e.g.*, Xerox's "Gyricon") may also be integrated into a tablet surface in accordance with the invention.

In a variation, "reversible paper" may be overlaid on a tablet surface such that freehand input may be conveyed to the tablet surface through the "paper." In such a variation, the stylus may include an erasable writing marking medium to provide visible indicia of such freehand input on the "paper." Text generated, for example by voice input, may be displayed on a conventional display (*e.g.*, LCD, CRT, etc.) separate from the tablet surface. Color displays permits visible "ink" of different colors to be displayed. However, monochromatic displays may also be used, for example to save costs when incorporated into a number of tablets that are used as "scrap computers."

A tablet interface interprets editing commands responsive to freehand input and provides indicia of the editing commands to an editor. The tablet interface may also interpret handwriting responsive to freehand input and provide text data to the editor. Handwriting may be distinguished from editing commands by a subsystem of the type disclosed in U.S. Patent 5,862,256, issued Jan. 19, 1999 to Zetts *et al.* The detailed description portion (including referenced drawing figures) of this aforementioned patent is incorporated herein by reference. Further, the detailed description portion (including referenced drawing figures) of any U.S. patent or U.S. patent application incorporated by reference into this aforementioned patent is also specifically incorporated herein by reference. Tablet interface 164 of system 100, for example, suitably includes: tablet surface 152 having an integrated LCD display; conventional hardware (not shown) for determining the position of a stylus on surface 152; and a conventional CPU and memory (also not shown) having indicia of suitable software instructions for the CPU to implement, *inter alia*, handwriting and/or gesture recognition.

Editing commands include any commands for modifying text data that may be communicated by freehand input. A set of particularly advantageous editing commands is provided in TABLE II below.

TABLE II

Editing Command	Corresponding Freehand Input
Delete Text	Straight horizontal line through displayed text; or diagonal or wavy line through block of displayed text.
Underline Text	Straight horizontal line immediately below displayed text.
Capitalize Text	Two straight horizontal lines immediately below displayed text.
Lowercase character	Diagonal line through displayed character.
Bold Text	Straight horizontal lines immediately above and below displayed text.
Italicize Text	Diagonal slashes immediately before and after displayed text.

Editing Command	Corresponding Freehand Input
Correct Misrecognition of Text	Straight horizontal line through displayed text followed immediately by stylus tap somewhere on the text; or closed curve around block of displayed text followed immediately by stylus tap somewhere within the curve.
Indicate Text out of Present Context (without going through correction dialog)	Straight horizontal line through displayed text followed immediately by double stylus tap somewhere on the text
Indicate Text out of User Context (without going through correction dialog)	Straight horizontal line through displayed text followed immediately by another straight horizontal line back through the text, then by double stylus tap somewhere on the text, or
Copy Text	Closed curve around block of displayed text.
Paste Text	Double tap at desired insertion point on display of destination tablet (same or different from source tablet).
Move Insertion Point	Single tap at new insertion point on display of desired tablet (same or different from tablet having old insertion point).
Find Text	Question mark (?) drawn in isolated white space (e.g., margin) of display. Dictate text to find into provided text input dialog box.
Find Other Occurrences of Displayed Text	Closed curve around block of displayed text, immediately followed by question mark (?) drawn in isolated white space (e.g., margin) of display.

In a variation of tablet 150, tablet interface 164 includes a conventional handwriting recognizer that responds to freehand input to generate text data in addition to, or as an alternative to, text data generated by voice input. In such a variation, tablet 150 performs two types of message recognition: speech recognition and handwriting recognition. As discussed below with reference to FIGS. 2, 3, and 5, an alternative system 200 includes a multi-input message recognizer 310. Message recognizer 310 performs both types of message recognition (speech and handwriting) in accordance with a unified message model. As discussed below, a unified message model according to various aspects of the present invention provides particular advantages.

A tablet according to various aspects of the present invention may include user controls for convenient navigation in an electronic document. For example, tablet 150 includes a "Page Up"

button 154 and a "Page Down" button 156 conveniently positioned together near the edge of tablet 150. User 240 may navigate through an electronic document using tablet 150 via depressing buttons 154 and 156 with his or her right thumb. When tablet 150 is positioned for comfortable use, for example resting on the thigh portion of a crossed leg of user 240, only one hand is needed for support and control of tablet 150. Typically, user 240 may then use an opposite hand to manipulate stylus 110 on surface 152 of tablet 150. If user 240 is right-handed, he or she may flip tablet 150 upside-down from the orientation shown in FIG. 1B to support and control tablet 150 with his or her left hand while manipulating stylus 110 with the right hand. If user 240 is one-handed, he or she may prefer to rest tablet 150 on a supporting surface and use stylus 110 for both freehand input and for depressing buttons 154 and 156.

Tablet surface 152 includes an integrated display for displaying an electronic document and any additional user controls that may be desired. Preferably, the display is configured to preserve clarity at a wide range of viewing angles and under varied lighting conditions. When tablet surface 152 is integrated with a color display, additional user controls may include a displayed group of software-based mode controls ("inkwells") at the bottom of tablet surface 152 for changing the behavior of freehand input. For example, user 240 may "dip" pointer 610 of stylus 110 in a red inkwell 157 to begin modifying text data using editing commands such as those in TABLE II. A yellow inkwell 158 may be provided to initiate highlighting and/or annotating of text data, a black inkwell 159 may be provided to initiate freehand input of new text data, and a white inkwell 153 may be provided to initiate erasure (*i.e.*, deletion) of text data. In a variation, touch-sensitive pads (each responsive to contact with pointer 610) may be provided below tablet surface 152 in red, yellow, black, and/or white colors to serve as such "inkwells."

An editor (*e.g.*, editor 168) according to various aspects of the present invention includes any suitable hardware and/or software for modifying text data as specified by editing commands. Examples of suitable editing commands are provided in TABLE II above. As discussed above, text data is any indicia of text that may be stored in conveyed numerically, including numerical codes representing individual units of text.

In one computing model, text data may be considered to be generated by a source other than an editor. In such a model, text data may be stored in a global memory segment that is

accessible to both a speech recognizer and an editor. In another computing model, text data may be considered to be generated by an editor that is responsive to external sources of text input. For example, text data may be stored in a local memory segment that is controlled by an editor. External sources of text (*e.g.*, a keyboard interface or speech/handwriting recognizer) may have access to such a local memory segment only through the editor that controls it. In either computing model, an editor has access to text data to both read and modify the text data. For example, editor 168 of tablet 150 (FIG. 1A) performs any desired modifications to text data generated by speech recognizer 162 in accordance with editing commands communicated by freehand input and interpreted by tablet interface 164.

A stylus according to various aspects of the present invention may be advantageously used with a tablet interface and editor of the type disclosed in U.S. Patent 5,855,000, issued December 29, 1998 to Waibel *et al.* The detailed description portion (including referenced drawing figures) of this aforementioned patent is incorporated herein by reference. Further, the detailed description portion (including referenced drawing figures) of any U.S. patent or U.S. patent application incorporated by reference into this aforementioned patent is also specifically incorporated herein by reference. For example, stylus 110 may be used to convey freehand input (*e.g.*, cursive handwriting, gestures) and voice input via the input device (*e.g.*, a tablet surface) and microphone, respectively, that are disclosed in U.S. Patent 5,855,000 to Waibel *et al.*

When suitably constructed (*e.g.*, with miniaturized electronics, lightweight materials, a thin, flat form factor, etc.), a tablet according to various aspects of a present invention may be made to have the look and feel of an "electronic notepad," which may be stacked and laid on a desk like a conventional paper document. When so constructed, a tablet such as tablets 150, 252, 254, and/or 256 may be used as a "scrap computer," analogous to scrap paper and having limited individualized identity and importance. Several such tablets may be used together in a network (preferably wireless) such that any one may be picked up and used anywhere in a work environment to display an electronic document and receive freehand input with a stylus. Instead of constantly opening and closing applications in the on-screen windows of a single desktop computer, a user may stack the tablets around an office and have several of them in use for various tasks at the same time.

A networked text processing system according to various aspects of the present invention includes any plurality of tablets networked together to permit exchange of data between them. Such networking provides particular advantages. For example, text data may be transferred between tablets. A document may be displayed in multiple views on displays of multiple tablets. A stylus including a microphone and identification circuit according to various aspects of the present invention may be used to generate text data in accordance with a message model associated with a particular owner of the stylus. Tablets may be networked together through a domain controller, or by peer-to-peer communication.

A network of tablets may be of the type disclosed in U.S. Patent 5,812,865, issued September 22, 1998 to Theimer *et al.* The detailed description portion (including referenced drawing figures) of this aforementioned patent is incorporated herein by reference. Further, the detailed description portion (including referenced drawing figures) of any U.S. patent or U.S. patent application incorporated by reference into this aforementioned patent is also specifically incorporated herein by reference.

A preferred example of a text processing system including a network of tablets may be better understood with reference to FIGS. 2-5. Networked text processing system 200 suitably includes: a domain controller 220; a plurality (*e.g.*, three) of tablets 252, 254, and 256, each linked via wireless communications links 225 to domain controller 220; a first stylus 210 for conveying message input from a first user 242; and a second stylus 212 for conveying message input from a second user 244. Styluses 210 and 212 are linked to domain controller 220 via wireless communications links 235. System 200 further includes suitable wireless nodes 227 and 230 for establishing communications links 225 and 235, respectively.

A networked text processing system according to various aspects of the present invention may include only a single stylus. When multiple styluses are included, they need not be of the same type so long as they are all compatible with the system. For example, stylus 210 and stylus 212 may both be of the type of stylus 110 (FIGS. 1A, 1B, 6A, 6B). Alternatively, stylus 210 and stylus 212 may be of different types. For example, stylus 210 may be of the type of stylus 110 and stylus 212 may be of the type of stylus 710 (FIGS. 7A and 7B). In variations where the benefit of styluses having microphones is not required, conventional styluses without microphones may be used.

A networked text processing system according to various aspects of the present invention may include a node to a wide area network (*e.g.*, the Internet). A network connection permits one or more local message models that are internal to the system to be initialized to be in conformance with one or more user message models that are remote from the system (and possibly from each other). For example, system 200 includes a network node 232 for establishing a network connection link 237 between a plurality (*e.g.*, two) of user message models 264 and 262. When link 237 is established, local message model 316 may be initialized to be in conformance with message model 264 and/or message model 262, as discussed below.

Wireless nodes 227 and 230 include any suitable transmitter(s) and/or receiver(s) for establishing respective communications links 225 and 235. Transmitter 122 and receiver 160, discussed above with reference to FIG. 1A, are examples of suitable transmitters and receivers, respectively. Node 227 establishes bidirectional communications between domain controller 220 and each tablet 252, 254, and 256. Because communications link 225 is bidirectional, node 227 includes both a transmitter and receiver. Node 230 establishes unidirectional communications between domain controller 220 and styluses 210 and 212. Typically, only a unidirectional communications link is needed to a stylus, because the stylus typically only sends information.

Particular types of communications may be employed in communications links 225 and 235 in particular situations. For example, when tablets 252, 254, and 256 are in close proximity to each other and to domain controller 220 (*e.g.*, on a single work surface in a room), wired connections or infrared field radiation may be employed. When tablets 252, 254, and 256 are located in separate rooms from each other and/or from domain controller 220, suitable RF field radiation (*e.g.*, 1 GHz carrier frequency) may be employed.

A domain controller according to various aspects of the present invention includes any suitable hardware and/or software for controlling the interconnection of networked tablets to each other and to any styluses being used with the tablets. Advantageously, a domain controller may centrally implement functions of a message recognizer so that individual message recognizers are not needed in the networked tablets. In variations where the benefits of a domain controller are not required, networked tablets may each include a message recognizer and a receiver for establishing a communication link with one or more styluses.

As discussed in greater detail with reference to FIG. 3, exemplary domain controller 220 implements functional blocks including: message recognizer 310; stylus interface 320; and domain interface 330, which is coupled to message recognizer 310 as well as to a transfer buffer 340. As discussed above, interconnection between functional blocks may include hardware connections (*e.g.*, analog connections, digital signals, etc.) and/or software connections (*e.g.*, passing of pointers to functions, conventional object-oriented techniques, etc.). This interconnection is depicted in FIGS. 3A and 3B by signal lines for clarity.

Stylus interface 320 receives electromagnetic signals from one or more styluses (*e.g.*, styluses 210 and 212) and, responsive to the electromagnetic signal(s), couples one or more sets of signals to message recognizer 310. Each set includes a respective activation signal S_A, identification signal S_{ID}, and voice signal S_V.

Respective activation signals S_A activate message recognizer 310 (particularly speech recognizer 312) to provide text data responsive to voice input provided by a user of one particular stylus (*e.g.*, user 242 of stylus 210). In the event that activation signals from multiple styluses are received at once (indicating simultaneous voice input from multiple users), message recognizer 310 may provide respective portions of text data responsive to each voice input, for example by multitasking. Each portion of text may be conveyed to a different tablet for display. For example, text data provided responsive to voice (or handwriting) input from users 242 and 244 may be displayed separately (*e.g.*, as alphanumeric characters, kanji, etc.) on respective tablets 252 and 256. Alternatively, a hierarchy of styluses may be established such that message input conveyed by a low-ranking stylus may be preempted by message input conveyed by a high-ranking stylus. When multiple styluses are in wireless communication with a domain controller, electromagnetic signals from two or more styluses may be multiplexed by any suitable multiple access scheme (*e.g.*, spread spectrum, FDMA, TDMA, etc.).

Respective identification signals S_{ID} permit message recognizer 310 to associate message input conveyed by a particular stylus with a user message model of the user of a stylus. An identification signal according to various aspects of the present invention may include an encryption key to permit message recognizer 310 to interpret a user message model that has been encrypted for secure transmission across a wide area network. Message recognition in accordance with a user message model is described in greater detail below.

Domain interface 330 couples message recognizer 310 to tablets 252, 254, and 256 through wireless node 227 using any suitable multiple access and/or control protocol. Domain interface 330 conveys text data provided by speech recognizer 312 or handwriting recognizer 314 to a desired one of tablets 252, 254, and 256. Domain interface 330 also conveys respective stylus position signals S_P from tablet interfaces of tablets 252, 254, and 256 to handwriting recognizer 314.

Stylus position signal S_P communicates freehand input (conveyed to a tablet interface by a stylus) to handwriting recognizer 314 via domain interface 330. A stylus position signal conveys indicia of the position of the stylus on a tablet surface in any suitable format (*e.g.*, multiplexed binary words representing X, Y coordinates). When a stylus is aimed at, but does not contact, a particular point on a surface, a stylus position signal may convey indicia of the particular point aimed at.

An editor according to various aspects of the present invention may be implemented as part of a domain interface. For example, domain interface 330 may perform the same functions for networked tablets 252, 254, and 256 that editor 168 performs for tablet 150. When a domain controller performs functions of a message recognizer and editor for a plurality of networked tablets, hardware and/or software in the networked tablets may be simplified.

A domain controller may include a transfer buffer (*e.g.*, a portion of memory) to facilitate transmission of data from one networked tablet to another. For example, user 242 may cause text data to be copied from tablet 252 into transfer buffer 340 through domain interface 330. With an editing command from the set provided in TABLE II above, for example, the user may cause a block of displayed text data to be copied by using stylus 210 to draw a closed curve around the block. User 242 may then caused text data to be pasted from transfer buffer 340 to tablet 252. Again using an editing command from the set provided in TABLE II, the user may cause a block of displayed text data to be pasted by using stylus 210 to double-tap at the desired insertion point on the display of tablet 254. When tablets are interconnected in a peer-to-peer network (omitting a domain controller), text data that is copied from the display of a tablet may be stored in a transfer buffer in the tablet until the text data is pasted at a desired insertion point.

A domain controller may include a housing, supporting and/or control circuitry (*e.g.*, power supply, operator controls, etc.), and a conventional CPU and memory (not shown) having indicia

of suitable software instructions for the CPU to implement, *inter alia*, functional blocks of FIG. 3. A "desktop" domain controller may be placed on a work surface as a semi-permanent fixture in a work area. Suitable variations of domain controllers include, for example, unobtrusive (perhaps hidden for aesthetic reasons) wall panels and electronic "white boards" (*e.g.* "Boards" of the type disclosed in U.S. Patent 5,812,865 to Theimer et al., incorporated by reference above). A domain controller may also be incorporated into one tablet of a plurality of networked tablets.

A message recognizer according to various aspects of present invention includes any suitable hardware and/or software for recognizing a message of at least one type to provide text data. A message includes any communication in writing, in speech, or by signals. As may be better understood with reference to TABLE III below, examples of types of messages to be recognized include voice input (for speech recognition), freehand input (for handwriting recognition), and visual input (for optical character recognition).

TABLE III

Type of Message Recognizer	Associated Type(s) of Message Input	Associated Type(s) of Message Model
Generic: Message Recognizer	Generic: any communication in writing, in speech, or by signals	Generic: Message Model
Speech recognizer	Voice input (speech)	Acoustic model, language model
Handwriting recognizer	Freehand input (handwriting)	Handwriting model, language model
Visual character recognizer	Visual input (printed or handwritten characters that are scanned for OCR)	Character model, language model
Sign language recognizer	Visual input (CCD image of signing hands) or tactile input (glove with sensors)	Gesture model, language model

A message recognizer may include multiple subordinate message recognizers of different types within it. A message recognizer may include, for example, a speech recognizer or a handwriting recognizer, or both. A speech recognizer according to various aspects of the present invention includes any suitable hardware and software for providing text data responsive to voice

input. A concise summary of the operation of a conventional speech recognizer is provided in U.S. Patent 5,839,106 to Bellegarda (incorporated by reference below), particularly from column 3, line 46 through column 4, line 43. A handwriting recognizer according to various aspects of the present invention includes any suitable hardware and software for providing text data responsive to freehand input. A handwriting recognizer may be of the type disclosed in U.S. Patent 5,903,668, issued May 11, 1999 to Beernink, incorporated by reference above.

A message recognizer may include a visual handwriting recognizer for generating text data from scanned handwriting, which may be of the type disclosed in U.S. Patent 5,862,251, issued Jan. 19, 1999 to Al-Karmi *et al.* The detailed description portion (including referenced drawing figures) of this aforementioned patent is incorporated herein by reference. Further, the detailed description portion (including referenced drawing figures) of any U.S. patent or U.S. patent application incorporated by reference into this aforementioned patent is also specifically incorporated herein by reference.

A message recognizer including both a speech and handwriting recognizer may be adapted from the disclosure of U.S. Patent 5,502,774, issued March 26, 1996 to Bellegarda. The detailed description portion (including referenced drawing figures) of this aforementioned patent is incorporated herein by reference. This aforementioned patent cites a number of technical papers that may be reviewed for further guidance on the structure, training, and operation of conventional speech recognizers and handwriting recognizers. In a variation, a message recognizer may include a speech recognizer and handwriting recognizer of the type disclosed in U.S. Patent 5,855,000, issued December 29, 1998 to Waibel *et al.*, incorporated above by reference. In domain controller 220, message recognizer 310 includes both a speech recognizer 312 and handwriting recognizer 314 for recognizing voice and handwriting types of message input, respectively.

A message model according to various aspects of present invention includes any model (*e.g.*, algorithm, mathematical expression, set of rules, etc.) for defining operation of a message recognizer to provide text data responsive to message input. Conventionally, a message model includes a language model and a model specific to one type of message recognition. For example, a conventional speech recognizer operates in accordance with a type-specific message model consisting of a language model and an acoustic model. As a further example, a

conventional handwriting recognizer operates in accordance with its own type-specific message model that consists of a language model and a handwriting model.

A unified message model according to various aspects of the present invention provides particular advantages over a conventional message model. A unified message model is a message model that includes a shared language model and models specific to at least two types of message recognition. As may be better understood with reference to FIG. 9, a unified message model may suitably include, *inter alia*, a language model, an acoustic model, and/or a handwriting model.

A message recognizer may include two or more types of subordinate message recognizers, each of which may operate in accordance with a shared language model. Advantageously, the accuracy of each subordinate message recognizer may be improved by user correction of misrecognition by any of the message recognizers. For example, the syntactic language model in a shared language model may be trained by user correction of any type of erroneous message recognition performed by the message recognizer. An exemplary correction process 1400 is described below with reference to FIG. 14.

A shared language model according to various aspects of the present invention is any language model that may be shared between two types of subordinate message recognizers included within a message recognizer. A message recognizer of a first type may provide text data responsive to a first type of message input (*e.g.*, voice input) in accordance with the shared language model and a first type-specific model (*e.g.*, an acoustic model). A message recognizer of a second type may provide text data responsive to a second type of message input (*e.g.*, freehand input) in accordance with the shared language model and a first type-specific model (*e.g.*, a handwriting model). A language model may be of a conventional type, for example consisting of an N-gram syntactic model.

An example of a unified message model may be better understood with reference to FIG. 3B. Local message model 316 includes a language model 350, an acoustic model 356, and a handwriting model 358. An acoustic model is any model that may be used to determine basic units of speech (*e.g.*, phonemes, allophones, etc.) responsive to suitably transformed voice input (*e.g.*, by a conventional acoustic feature extractor). A handwriting model is any model that may be used to determine basic units of handwriting conveyed by freehand input (*e.g.*, strokes of

printed characters or cursive words) responsive to suitably transformed freehand input, for example as disclosed in U.S. Patent 5,903,668 to Beernink (incorporated by reference above).

Speech recognizer 312 generates text data in accordance with acoustic model 356 and shared language model 350. Handwriting recognizer 314 generates text data in accordance with handwriting model 358 and shared language model 350. Advantageously, user training of language model 350 can improve accuracy of both speech recognizer 312 and handwriting recognizer 314. For example, user correction of misrecognition by speech recognizer 312 adapts syntactic model 352 of shared language model 350. Both speech recognizer 312 and handwriting recognizer 314 then operate in accordance with the adapted syntactic model.

A local message model according to various aspects of the present invention is any message model that is local to a message recognizer operating in accordance with the message model. A message model is said to be local to a message recognizer when the message recognizer may operate in accordance with the message model without the necessity of communications outside its local processing environment. For example, a message model implemented in the same memory space, virtual machine, or CPU as a message recognizer is said to be local to the message recognizer.

A user message model according to various aspects of the present invention is any message model that is specific to a particular user. In variations where the benefits of a unified message model are not required, a user message model may be of a conventional type. A message model is said to be specific to a particular user when the message model may be adapted by training input from the user. Such adaptation provides improved recognition.

Training input includes corrections of misrecognized message input by any suitable form of user input. For example, a tablet (*e.g.*, tablet 252) according to various aspects of the present invention may include a character interface for user correction of misrecognition. A character interface is any user interface (*e.g.*, conventional keyboard or software user interface simulating a keyboard on a display) that is responsive to character input. Character input is a selection of specific characters using a character interface, for example by using a stylus to depress keys on a miniature keyboard or to tap areas of a display that represent keys of a simulated keyboard.

When a character interface (not shown) is provided (*e.g.*, on a display of tablet 252), a language model according to various aspects of the present invention may be adapted by a

correction process using (at least in part) character input. An exemplary correction process 1400 may be better understood with reference to FIG. 14. Process 1400 begins at step 1410 with a user specifying, typically by freehand input, a selection of text that has been generated (erroneously) by a message recognizer. At step 1420, a correction mode is initiated for modifying the selection.

A user may specify text and initiate a correction mode by communicating any appropriate editing command (*e.g.*, with freehand input, voice input, etc.). With an editing command from the set provided in TABLE II above, for example, the user may cause steps 1410 and 1420 to be carried out by using a stylus to draw a straight horizontal line through a displayed text segment, then immediately tapping the stylus somewhere on the text segment. As alternatively specified in TABLE II, a user may also specify a selection of text by drawing a closed curve around a block of displayed text (*e.g.*, a phrase of several words), then immediately tapping the stylus somewhere within the curve.

At step 1430, a list of alternative text comparable to the selection is provided. The list includes text segments that each received a high score (but not the maximum score) during hypothesis testing of the message recognizer. Two lists of alternative text of the type that may be produced at step 1430 are shown by way of example in TABLE IV and TABLE V below. As discussed below, the lists of TABLE IV and TABLE V were displayed in a correction mode of a conventional computer configured as a speech recognizer by executing conventional speech recognition software, marketed as NATURALLY SPEAKING, Preferred Edition, version 3.01, by Dragon Systems, Inc.

At step 1440, the list of alternative text is updated, based on character data communicated after initiation of the correction mode. In a conventional speech recognizer such as a computer executing the NATURALLY SPEAKING software, the displayed list of alternative text changes as different characters are entered by a user using character input.

At step 1450, the selected text segment is modified responsive to the character input. Step 1450 is carried out when the user indicates that the text segment as modified accurately reflects the message input provided by the user. In a conventional speech recognizer such as a computer executing the NATURALLY SPEAKING software, the modifications to the selected text segment are entered when the user selects an "OK" control of a displayed user interface dialog.

At step 1460, the syntactic model is conventionally adapted in accordance with the user's modification to the selected text segment.

When a language model includes a semantic model according to various aspects of the present invention, training input also includes user identification of a present context or a user context. User identification of context may be performed in addition to, or alternatively to, correction of misrecognized message input.

Local message model 316 may be initialized to be in conformance with one or more user message models (*e.g.*, user message model 262 or 264). A local model is said to be in conformance with a user model when a message recognizer operating in accordance with the local model behaves substantially as if it were actually operating in accordance with the user message model.

Initialization of a model entails creation of a new model or modification of a model from a previous configuration to a new configuration. A local model may be initialized by any suitable hardware and/or software technique. For example, a local model may be initialized by programming of blank memory space with digital indicia of a user model that the local model is to conform with. Alternatively, a local model may be initialized by overriding of memory space containing digital indicia of a previous configuration with indicia of digital indicia of a new configuration. The previous configuration of the local model is in conformance with a previous local model (*i.e.*, of a previous user). The new configuration is in conformance with a new local model (*i.e.*, of a new user).

In system 200, local message model 316 may be initialized to be in conformance with, for example, user message model 262. During this initialization, digital indicia of user message model 262 is transferred to the local processing environment of message recognizer 310 via network connection 237 and digital signal S_N.

Message recognizer 310 may retrieve a selected user message model from a remote database via, for example, an Internet connection. Identifying signal S_{ID} may specify an Internet address (*e.g.*, URL) from which the stylus owner's model may be retrieved. Local message model 316 may then be initialized to conform to the remotely located user model. When security is a concern, the user message model may be transmitted in an encrypted format, to be decrypted in accordance with a key that may be provided, for example, in identifying signal S_{ID}.

After a message recognition session, a local message model may have been adapted by user training, preferably including both correction of misrecognition and user identification of a user context. Advantageously, a user message model may be initialized to be in conformance with an adapted local message model. For example, message recognizer 310 may transfer digital indicia of local message model 316 (after user training) from its local processing environment to a remote database where user message model 262 is stored. User message model 262 may thus be initialized to be in conformance with adapted local message model 316. Accordingly, in message recognizer according to various aspects of the present invention provides a user with the opportunity to adapt and modify his or her user message model over time, regardless of the particular system in which he or she employs it for message recognition. A user of such a message recognizer may develop a highly adapted message model by, and for, use of the model in many different message recognition systems.

User training may include adaptation of an acoustic model in the message model. Advantageously, the acoustic model may be adapted over time using a single stylus-mounted microphone. Use of the same stylus for user training provides acoustic consistency, even when the stylus is used with many different message recognition systems.

In variations where the benefits of a user message model are not required, a message recognizer may operate in accordance with a number of generic local message models, each generally tailored to portions of an expected user population. When so configured, domain controller 220 may include a local database in non-volatile memory (not shown) for storing such models.

As discussed above, a message recognizer according to various aspects of the present invention may be responsive to message input from a plurality of users to provide respective portions of text data. Such a message recognizer may operate in accordance with a plurality of respective local message models. Each respective local message model may be initialized to be in conformance with a user message model of a particular user. For example, message recognizer 310 may operate at times in accordance with a second local message model (not shown). This second model may be initialized to be in conformance with a second user message model, for example user message model 264.

A language model is any model that may be used to determine units of language responsive to input sequences of text segments. Such input sequences may be derived, for example, from voice input and/or freehand input in accordance with a respective acoustic model or handwriting model. In message recognizer 310, for example, speech recognizer 312 first derives units of speech responsive to feature vectors (which are conventionally derived from voice signal S_V) in accordance with acoustic model 356. (Acoustic model 356 is part of unified message model 316.) Speech recognizer 312 then derives units of language (here, strings of text data) from the units of speech in accordance with language model 350. Speech recognizer 312 provides the derived units of language as text data to domain interface 330. Handwriting recognizer 314 first derives units of handwriting responsive to feature vectors (which are conventionally derived from stylus position signal S_P) in accordance with handwriting model 358. Handwriting recognizer 314 then derives units of language (again, strings of text data) from the units of handwriting in accordance with language model 350. Handwriting recognizer 314 provides the derived units of language as text data to domain interface 330. Handwriting recognizer 314 also provides (to domain interface 330 and ultimately to an editor) indicia of any editing commands conveyed by freehand input, as communicated by stylus position signal S_P.

Language model 350 includes a syntactic model 352 and a semantic model 354. Syntactic model 352 provides a set of *a priori* probabilities based on a local word context, and may be a conventional N-gram model. Semantic model 354 provides probabilities based on semantic relationships without regard to the particular syntax used to express those semantic relationships. As described below, semantic model 354 may be adapted according to various aspects of the present invention for accurate identification of a present context or a user context. In a variation where the benefits of user context identification are not required, semantic model 354 may be of the type disclosed in U.S. patent 5,828,999 to Bellegarda et al. (incorporated by reference below). In a further variation where the benefits of semantic analysis are not required, language model 350 may omit semantic model 354.

As discussed above, a language model may include a syntactic model, a semantic model having a plurality of semantic clusters, or both. For example, a language model may be of the type disclosed in U.S. patent 5,839,106, issued November 17, 1998 to Bellegarda and U.S. patent 5,828,999, issued October 27, 1998 to Bellegarda *et al.* The detailed description portion (including referenced drawing figures) of each of these two aforementioned patents is

incorporated herein by reference. Further, the detailed description portion (including referenced drawing figures) of any U.S. patent or U.S. patent application incorporated by reference into either of these two aforementioned patents is also specifically incorporated herein by reference.

A semantic model may be adapted, according to various aspects of the present invention, for accurate identification of a present context, *i.e.*, the context of text currently being presently generated or a user context, *i.e.*, the type of text that may be expected to be generated by the user. A system and method according to various aspects of the invention provides the user with an opportunity to identify text segments that are not expected to occur in the present context of the text currently being generated, or in the user context. Such text segments are referred to herein as "stop segments," and may include more or less text than a single word. Semantic clusters associated with user-identified stop segments may be expected, in accordance with the inventive semantic model, to be outside the present context.

The semantic model may be part of a shared language model of the invention. In message recognizer 310, for example, semantic model 354 is part of shared language model 350. A message recognizer may include two or more subordinate message recognizers, each of which may operate in accordance with the semantic model in the shared language model. Advantageously, the accuracy of each subordinate message recognizer sharing a language model that includes a semantic model model according to various aspects of the present invention may be improved by user identification of context.

A message recognizer (*e.g.*, speech recognizer 162 of system 100 or message recognizer 310 of system 200) may perform a context-sensitive hypothesis test of text segments against message input in accordance with an adapted semantic model. In cooperation with the message recognizer, the adapted semantic model biases against those tested segments that have a high probability of occurrence in clusters considered to be outside the present context. Advantageously, the model may cause such biasing by simply applying a negative bias against those text segments having a high probability of shared cluster occurrence with stop segments. A semantic model is said to bias against a tested segment when a message recognizer scores the tested segment less favorably in a hypothesis test due to the operation of the semantic model.

In the discussion below of semantic models according to the invention, two examples of semantic model operation are provided to illustrate the benefit of user context identification in

particular situations. The first of these two examples illustrates how certain text segments can be expected to be especially useful for indicating context as stop segments. The second example illustrates how certain text segments are less useful for indicating context.

The first example of semantic model operation is referred to herein as the "Coors Uncle" example. In the "Coors Uncle" example, the phrase "straight *horizontal* line through" was dictated (*i.e.*, communicated by voice input) to a conventional speech recognizer, which was a computer executing the NATURALLY SPEAKING software discussed above. The speech recognizer provided the text data "straight *Coors Uncle* line through" in response to the voice input. The dictated phrase and the speech recognizer's alternative text segments are listed below in TABLE IV.

TABLE IV

Dictated Phrase: Straight [Coors Uncle] horizontal line through	
Ranking	**Alternative Text**
1	Coors Uncle
2	cores Uncle
3	core is Uncle
4	Coors uncle
5	Cora's uncle
6	core his uncle
7	or his uncle
8	core as Uncle
9	corps is Uncle
10	quarters Uncle

The phrase "straight horizontal line through" was dictated by the Applicant during preparation of the present patent application. The text data "straight *Coors Uncle* line through," generated by the conventional speech recognizer (a computer executing the NATURALLY SPEAKING software) in response, was clearly out of the context of such a document. Because it would be very unusual for the Applicant to write a document relating to the consumption of alcoholic beverages, words relating to alcohol consumption (e.g., beer, brewing, etc.) are

unlikely to appear in any document the Applicant generates. If a message recognizer operating in accordance with the semantic model of the invention were used, the word COORS (a registered trademark of the Coors Brewing Company) would likely have been designated as a stop word outside the user context.

As discussed below, a user may identify stop segments by any suitable system or method. In the "Coors Uncle" example, the user may identify the word COORS as being outside the user context by drawing a double line through it, for example in the first alternative text listing "Coors Uncle." Double lines may then appear drawn through each occurrence of the word COORS, since the word has been identified as a "user context" stop segment.

A nontechnical word that appears in a technical document such as a patent application may be designated as a stop word outside the present context, regardless of the author's overall writing habits. For example, words relating to familial relationships (including the word UNCLE) are not typically used in patent applications. In the "horizontal" example, a user may identify the word UNCLE as being outside the present context (but not the user context) by drawing a single line through it, for example in the first alternative text listing "cores Uncle." Double lines may then appear drawn through each occurrence of the word UNCLE, since the word has been identified as a "present context" stop segment.

A user context is the context of all documents generated by a particular user. A user context may also be viewed as a context of all documents generated by a group of users, such as members of a particular collaborative group. Examples of collaborative groups include project teams, institutions, corporations, and departments. Members of a collaborative group may share a common pool of stop segments. A stop segment designated by any member of the group as being outside his or her user context is then considered to be outside the user context of each group member. In one variation, a leader of the group may review a list of pooled stop segments and edit the list. In another variation, each group member may remove pooled user stop segments (at least from operation of message recognition responsive to his or her message input) that the member considers to be inside his or her particular user context.

Advantageously, a user context may exclude words not consistent with the writing style of a particular user (or collaborative group). For example, a user who writes only technical documents may appreciate the opportunity to designate profanities and slang terms as being

outside the user context. The designation of a profanity or slang term as a stop word outside the user context may cause a semantic model of the invention to bias against other profanities or slang terms. Alternatively, a fiction writer may appreciate the opportunity to designate technical terms as being outside the user context.

The second example of semantic model operation is referred to herein as the "words on" example. In the "words on" example, the phrase "straight *horizontal* line through" was again dictated (*i.e.*, communicated by voice input) to a conventional speech recognizer, which was again a computer executing the NATURALLY SPEAKING software. The speech recognizer provided the text data "straight *words on a* line through" in response to the voice input. The dictated phrase and the speech recognizer's alternative text segments are listed below in TABLE V.

TABLE V

Dictated Phrase: Straight [words on a] horizontal line	
Ranking	**Alternative Text**
1	words on a
2	words on
3	for his all

The phrase "straight horizontal line through" was dictated the second time by the Applicant during preparation of the present patent application. The text data "straight *words on a* line through," generated by the conventional speech recognizer (a computer executing the NATURALLY SPEAKING software) in response, was not clearly out of the context of such a document. The text segments "words," "on," and "a" are common words that appear frequently in many different types of documents including the present patent application. If a message recognizer operating in accordance with the semantic model of the invention were used, none of the alternative text segments listed in TABLE V would be useful to designate as stop segments.

A semantic cluster includes any semantic association of text in a language model. In a first exemplary semantic model of the present invention, a semantic cluster is of a first type. The first type of semantic cluster is a mathematically derived group of vectors representing text segments (*e.g.*, words). The vectors may lie in a word-document vector space defined by a word-

document matrix, which tabulates the number of times each word of a suitable training corpus occurs in each of a plurality of documents (or paragraphs, sections, chapters, etc.) in the corpus. The vectors may be clustered, for example, based on a distance measure between the word vectors in the vector space after a singular value decomposition of the word-document matrix. Such a technique is taught in U.S. patent 5,828,999 to Bellegarda *et al.*, incorporated by reference above. The disclosure found from column 4, lines 8-54; from column 5, line 35 through column 7, line 35; and column 8, lines 3-24 of the aforementioned patent is considered particularly instructive for the identification of semantic clusters of this first type.

In a second exemplary semantic model of the present invention, a semantic cluster is of a second type. The second type of semantic cluster is a discrete grouping of text that may be expected to have a particular context, *e.g.*, discussing a particular topic. Examples of semantic clusters of this type include documents within a document collection (*e.g.*, an article within the standard Wall Street Journal training corpus), paragraphs within a document, and sections of text separated by headings in a document.

Additional types of semantic clusters include, for example, a third type of semantic cluster, which is defined with respect to an individual reference word that is considered to be indicative of a particular context. For example, a semantic cluster of this type may include all words found within a given number (*e.g.*, 50) of a particular reference word in a training corpus. Such a semantic cluster may be given indefinite boundaries by applying words further from the reference word may given a lower semantic association than text close to the reference point.

A method 1000 for the identification of semantic clusters of the second type (for the second exemplary semantic model) may be better understood with reference to FIG. 10. Method 1000 begins with a suitable training corpus, which is partitioned into discrete semantic clusters at step 1010. Discrete semantic clusters are semantic clusters of the second type discussed above. A commonly used corpus is the standard Wall Street Journal corpus. Another corpus, referred to as TDT-2, is available from Linguistic Data Consortium (LDC). The TDT-2 corpus consists of about 60,000 stories collected over a six-month period from both newswire and audio sources. When the TDT-2 corpus is employed in process 1000, each story is preferably partitioned into a discrete semantic cluster at step 1010.

At step 1020, each semantic cluster is analyzed. Text segments occurring in each cluster are counted and tabulated into a two-dimensional matrix Z. This matrix is used at steps 1030 and 1050 to compute probabilities of global and shared cluster occurrence, respectively.

An exemplary process 1100 for carrying out step 1020 may be better understood with reference to FIG. 11. At step 1110, process 1100 begins by setting pointers i and k both to zero for counting of the first text segment w_0 in the first cluster C_0. At step 1120, a count is made of the number of occurrences of one text segment w_i of the corpus in one cluster C_k of the corpus. When step 1120 is first carried out after step 1110, the count is made of the number of occurrences of the first text segment w_0 in the first cluster C_0. Each count is tabulated in a respective element $Z_{i,k}$ of matrix Z, starting with element $Z_{0,0}$.

After each occurrence of step 1120, a determination is made at decision step 1130 as to whether or text segments of the corpus are still to be counted in the present cluster. If so, pointer i is incremented at step 1135 and step 1120 is repeated to count the number of occurrences of the next text segment of the corpus in the present cluster. If no text segments remain to be counted in the present cluster, process 1100 continues at decision step 1140.

At decision step 1140, a determination is made as to whether or semantic clusters of the corpus are still to be analyzed. If so, pointer k is incremented at step 1145 and step 1120 is repeated to count the number of occurrences of the first text segment of the corpus in the next cluster. If no clusters remain to be analyzed, process 1100 is complete and method 1000 continues at 1030 (FIG. 10).

At step 1030, the probability of global cluster occurrence is computed for most (or all) text segments in the corpus. In the second exemplary semantic model, the probability of global cluster occurrence may be expressed as $Pr(w_i|V)$. "V" indicates "given the entire vocabulary (*i.e.*, corpus)." $Pr(w_i|V)$ is the probability that a given text segment w_i of the corpus will appear in a random sample (adjusting for sample size) of text segments chosen from the corpus. $Pr(w_i|V)$ may also be viewed as the probability that a randomly chosen text segment of the corpus (globally, *i.e.*, without regard to any particular semantic cluster) will be a given text segment w_i. The more times a given text segment w_i appears in the corpus, no matter how distributed, the higher probability $Pr(w_i|V)$ will be.

Probability $Pr(w_i|V)$ may be computed (at least as an estimate) by any suitable statistical technique. For example, probability $Pr(w_i|V)$ may be computed for a given text segment wi based on the total number of occurrence of segment wi in matrix Z, divided by the total number of occurrences of all segments in matrix Z. Determination of probability $Pr(w_i|V)$ may be expressed by the following equation:

$$\Pr(w_i|V) \cong \frac{\sum_{k=0}^{N} Z_{i,k}}{\sum_{j=0}^{L}\sum_{k=0}^{M} Z_{j,k}}$$

At step 1040, a subset of text segments is selected for further analysis. The subset excludes text segments having a very high probability of global cluster occurrence. In the second exemplary semantic model, text segments that appear often are less likely to receive a negative bias, even though they may appear often in the same semantic clusters as stop words. The expectation is that commonly occurring text segments can be expected to occur in many different contexts, and that the present context is less likely to exclude such text segments.

By selecting text segments having a probability of global cluster occurrence $Pr(w_i|V) < P_1$, where P_1 is a predetermined upper limit of "commonness," words likely to be biased against may be omitted from consideration in the second exemplary semantic model. In the "Coors Uncle" example, the word BAR may be expected to appear in semantic clusters where consumption of alcohol may be discussed and could thus receive some negative bias when the word COORS is identified as a stop segment. However, the word BAR also has many synonymous meanings (e.g., "sand bar," "metal bar," "patent bar," etc.) and would have relatively high probability of global cluster occurrence in most corpora, thus limiting the negative bias. By omitting words such as BAR that are likely to be biased against less severely, the second exemplary semantic model may be simplified.

At step 1050, the probability of shared cluster occurrence is computed for the selected text segments. In the second exemplary semantic model, the probability of shared cluster occurrence may be expressed as $Pr(w_i w_j|V)$. $Pr(w_i w_j|V)$ is the probability that two given text segments w_i and w_j of the corpus will appear together in a random sample (adjusting for sample size) of text

segments chosen from the corpus. The more times two given text segments w_i and w_j appear together in semantic clusters of the corpus, the higher probability $Pr(w_i w_j|V)$ will be.

Probability $Pr(w_i w_j|V)$ may be computed (at least as an estimate) by any suitable statistical technique. For example, probability $Pr(w_i w_j|V)$ may be computed for a given combination of text segments w_i and w_j based on the total number of occurrence of segment wi in matrix Z, divided by the total number of occurrences of all segments in matrix Z. The probability of shared cluster occurrence of text segments w_i and w_j may be estimated as the ratio between (1) the number of times text segments w_i and w_j can be paired together within semantic clusters of the corpus and (2) the total number of text segments in the corpus. Such an estimation of probability $Pr(w_i|V)$ may be expressed by the following equation:

$$Pr(w_i w_j|V) \cong \frac{\sum_{k=0}^{N} Min\{Z_{i,k}, Z_{j,k}\}}{\sum_{m=0}^{M}\sum_{k=0}^{N} Z_{m,k}}$$

Step 1060, probabilities $Pr(w_i|V)$ and $Pr(w_i w_j|V)$ are tabulated for each text segment in the subset and method 1000 is completed. An exemplary data structure 1200 for the tabulation of these probabilities may be better understood with reference to FIG. 12. Data structure 1200 includes tabulations of probabilities relating to three example words UNCLE, COORS, and BEACH of an exemplary subset. As discussed above, these words are used to illustrate two examples of message recognition in accordance with a semantic model of the present invention. As illustrated in data structure 1200, for example, the word UNCLE may be expected to have a high probability of shared cluster occurrence with other words related to familial relationships. By way of example (and not intended to be a report of actual results), words AUNT, NEPHEW, RELATIVE, and BROTHER are shown in data structure 1200 as secondary text segments under the primary text segment UNCLE. (In data structure 1200, a text segment that forms the heading of a listing is said to be a primary text segment and a text segment listed under the heading is said to be a secondary text segment.) In a tabulation performed at step 1060 of method 1000, using a training corpus described above, it is expected that the secondary text segments shown in

FIG. 12 would be listed with relatively high probabilities $Pr(w_i w_j |V)$ under each primary text segment shown.

In a variation, step 1060 may include manual editing of a tabulation such as that of data structure 1200. Primary text segments known to be poor indicators of context as stop segments may be manually identified and purged from the tabulation of data structure 1200, along with text segments listed under the purged text segments. For example, a manual (i.e., human) editor may know, based on his or her knowledge of linguistics and human intelligence, that certain secondary text segments have a closer semantic association with a given primary text segment than the probabilities otherwise generated by method 1000 would indicate. Accordingly, the manual editor may adjust the probability $Pr(w_i w_j |V)$ for each of those secondary text segments. In a further variation, step 1060 may include refinement of a tabulation such as that of data structure 1200 in an iterative design process. Such a design process may include manual and/or computer controlled editing of such a tabulation. For example, the design process could add and purge various secondary text segments, and modify probability $Pr(w_i w_j |V)$ for various secondary text segments, with the goal of minimizing an error constraint. A suitable error constraint may be the perplexity of message recognition, which may be (using a suitable test corpus) performed in accordance with each semantic model resulting from each iteration of the tabulation.

As discussed above, a stop segment is any text segment (*e.g.*, word, phrase, portion of a compound word) that has been identified by a user as being expected to be outside the present context or the user context. Stop segments may be identified by a user in a context definition mode. For example, a context definition mode may present the user with (1) a maximum likelihood text segment and (2) alternative text segments that the user could identify as being outside the present context or user context. The user may select alternative text segments to identify them as stop segments, for example by freehand input.

A user may identify stop segments by any suitable system or method. Stop segments may be identified in a context definition mode, which may be initiated whenever the identification of stop segments may be useful to determine context. The context definition mode may be initiated during a message recognition session, or prior to it. (An example of a message recognition session is the dictating of a document by voice input, with editing of the document by freehand

input.) A context definition mode may be initiated automatically when alternative text segments are located (*e.g.*, during hypothesis testing) that may be expected to be especially useful for indicating context as stop segments. Alternatively or in addition, a context definition mode may be initiated manually (*i.e.*, by the user).

An exemplary method 1300 for user identification of stop segments during message recognition may be better understood with reference to FIG. 13. Method 1300 begins at step 1310 with a segment of message input provided by a user. Such a segment may include, for example, a sentence dictated by the user with voice input or a handwritten phrase conveyed by the user with freehand input.

At step 1320, a message recognizer (*e.g.*, speech recognizer 162, message recognizer 310) performs hypothesis testing to identify text segments that each receive a high score in accordance with a message model. The text segment receiving the highest score (*i.e.*, the maximum likelihood text segment) is conventionally provided as the message recognizer's "best guess" of the text data corresponding to the message input. Text segments receiving high scores (*e.g.*, in the top 10) but not the highest are considered alternative text segments.

Although method 1300 is for the preparation of a semantic model according to various aspects of the present invention, the hypothesis testing of step 1320 may be performed in accordance with only a syntactic model. No semantic model may be used at step 1320 in certain situations, for example at the beginning of a message recognition session when the semantic model may not be considered ready for use.

At decision step 1330, a determination is made as to whether context definition is to be activated. If no context definition is initiated automatically or manually, message recognition proceeds at step 1310. If context definition is to be initiated, a context definition mode is entered for user identification of one or more stop segments.

In method 1300, a context definition mode is activated at step 1340. At step 1340, alternative text segments are listed for possible identification as stop segments by the user. At step 1350, text segments (if any) considered to be outside the present or user context are identified as stop segments.

A user may initiate a context definition mode manually. The context definition mode may be initiated when the user initiates a correction mode to correct a misrecognition by the message recognizer. Alternatively, a user may communicate an appropriate editing command to indicate, without initiating a correction process, that a text segment provided by a message recognizer is out of either the present context or the user context. With an editing command from the set provided in TABLE II above, for example, the user may indicate that a displayed text segment is out of the present context by using a stylus to draw a straight horizontal line through the text segment, then immediately double-tapping the stylus (*i.e.*, tapping the stylus twice, rapidly) somewhere on the text segment. The user may indicate that the text segment is out of the user context by using a stylus to draw a straight horizontal line through the segment, followed immediately by another straight horizontal line back through the segment, then immediately double-tapping the stylus somewhere on the segment.

A message recognizer may also have the ability to initiate a context definition mode automatically. A context definition mode may be automatically initiated when the message recognizer determines that one or more alternative text segments (*e.g.*, text segments receiving a high score during hypothesis testing) may be expected to be especially useful for indicating context as stop segments. A text segment may be expected to be especially useful for indicating context when it has a relatively high probability of global cluster occurrence and a relatively low probability of shared cluster occurrence with text segments in a document being generated (*e.g.*, other alternative text segments or the "best guess" of the message recognizer).

A context definition mode that is initiated automatically a present the user with a list of alternative text segments in addition to the message recognizer's "best guess." Alternatively, the user may be present with a simple question that may be quickly answered. For example, if the user dictates the sentence "Can you recognize speech?", the message recognizer may determine that the word BEACH could be especially useful for indicating context as a stop segment. If the message recognizer is configured to initiate a context definition mode automatically, the user might be presented with a dialog box containing the statement "You dictated the phrase RECOGNIZE SPEECH. Is the word BEACH of context?" and three "radio buttons" labeled "No," "Yes, this time," and "Always." If the word BEACH is not out of context, the user could select (or say) "No." If the word BEACH is outside the present context, the user could select or

say "Yes, this time." If the word BEACH is outside the user context, the user could select or say "Always."

For optimal configuration of a message recognizer to automatically initiate a context definition mode, a number of factors should be considered and weighed. Text segments that rarely occur in any context (*i.e.*, low probability of global cluster occurrence) are less useful as stop segments because they can be expected to have a high probability of shared cluster occurrence with only a limited number of other text segments. However, text segments that occur in very many contexts (*i.e.*, very high probability of global cluster occurrence) are of limited usefulness as stop segments because they could be expected to cause negative bias to many alternative text segments, in some cases a majority. Text segments that occur frequently in many contexts (*i.e.*, high probability of shared cluster occurrence with many text segments) are also of limited usefulness as stop segments because they can be expected to cause significant negative bias with only a limited number of other text segments. Text segments that have been generated previously in a document (or by a user) may be excluded from consideration as stop segments, since it may be presumed that the user has previously considered such text segments to be in the present (or user) context.

A message recognizer may initiate a context definition mode at the beginning of a message recognition session. For example, a list of text segments that are known to be especially useful as stop segments may be presented to a user. With a conventional dialog user interface, the user may check boxes appropriately labeled (e.g., "User" and "Present") next to listed text segments to identify them as stop segments being outside of the user or present context, respectively. Several lists may be presented interactively to the user to refine the definition of context as user input is processed. For example, if the user identifies the word UNCLE in a first list as being outside the present context (because it relates to familial relationships), a second list of possible stop segments may include the word FRIEND to determine whether the present context excludes discussions of all interpersonal relationships.

Identification of semantic clusters (e.g., by method 1000) may be performed as a nonrecurring software engineering process. Identification of stop segments (e.g., by method 1300) is typically performed as a user interaction process. After identification of semantic

clusters and one or more stop segments, a message recognizer may operate in accordance with a semantic model according to various aspects of the present invention.

As discussed above, a semantic model according to various aspects of the present invention biases against those tested segments that have a high probability of occurrence in clusters considered to be outside the present context. Such a model applies a negative bias against those text segments having a high probability of shared cluster occurrence with one or more stop segments identified by a user.

Negative bias may be applied by any suitable technique or combination of techniques. Examples of techniques for biasing against a tested text segment include: providing one or more suitable mathematical terms in one or more model equations to reduce the hypothesis score of the text segment; subtracting a computed value from the hypothesis score of the text segment; multiplying the hypothesis score of the text segment by a computed value (*e.g.*, a fractional coefficient); and selecting only text segments for further consideration, from within a range of hypothesis scores, that have not received a bias.

The negative biasing in the model may be proportional to the probability of shared cluster occurrence between each tested text segment and the identified stop segment(s). With proportional biasing, the adapted model applies a more negative bias against text segments that can be expected to appear frequently in semantic clusters together with a stop segment. In a variation, the negative biasing may also be inversely proportional to the probability of global cluster occurrence of each tested text segment. The semantic model then does not apply as negative a bias against a text segment that can be expected to appear in many semantic clusters as it would against a text segment that can be expected to appear in only a few semantic clusters, all other factors being equal.

The first exemplary semantic model is a modification of the semantic model disclosed in U.S. Patent 5,828,999 to Bellegarda, incorporated by reference above. The "mixture language model" disclosed in the '999 patent expresses probability of a word (*i.e.*, text segment) as the sum of *products* between (1) probability of the word, given each semantic cluster in the summation, and (2) probability of each respective semantic cluster, given a contextual history. The first exemplary semantic model, according to the present invention, departs from the model of the '999 patent by expressing probability of a text segment as the sum of *ratios* between (1)

probability of the text segment, given each semantic cluster in the summation, and (2). the combined probability of stop words sharing each semantic cluster.

The approach taken in the '999 patent is to determine probability of a tested text segment as a *positive* function of its probability of occurrence in a history of prior words. The inventive approach, generally speaking, is to determine probability of the tested text segment as a *negative* function of its probability of occurrence with user identified stop segments. The former approach calls for the message recognition system to guide itself *toward* a relevant context by looking backward to a history of prior words. The latter approach, generally speaking, asks the user to guide the message recognition system *away* from irrelevant contexts by looking forward to his or her goals for a particular document (present context) and as a writer (user context). In variations, it may be desirable for both approaches to be used in a combined language model, or combined in one semantic model.

The first exemplary semantic model, adapted with M stop segments, may be implemented mathematically, using the following equation:

$$\Pr(w_i) = \sum_{k=1}^{M} \left[\frac{\Pr(w_i | C_k)}{A + \sum_{j=1}^{L} B_j \Pr(s_j | C_k)} \right]$$

During message recognition in accordance with the first exemplary semantic model, when implemented by the equation above, a ratio is computed for each semantic cluster $C_1 \ldots C_M$ in the model. The probability of the tested text segment w_i occurring in each semantic cluster is divided by the combined probability of user identified stop segments $s_1 \ldots s_L$ occurring in the same semantic cluster. The combined probability may be computed in any suitable fashion. In the equation above, the individual probabilities of each stop segment s_j occurring in a given semantic cluster C_k are simply summed together. Although such a summation could result in a combined probability greater than 1.00, the combined probability permits multiple stop segments to contribute to an overall negative bias.

In a variation of the first exemplary semantic model, the combined probability may be computed as the inverse of the product of negative probabilities. (A negative probability in this example is considered the probability of a stop segment *not* occurring in a given semantic cluster.) In this variation, a high probability of any one stop segment occurring in a given semantic cluster will cause one low negative probability to be included in the product. Consequently, the inverse of the product, which in this variation is the combined probability, will be relatively high. The ratio computed in the first exemplary semantic model will thus be relatively low, effecting a negative bias based on the high probability of a single stop segment occurring in a given semantic cluster with the tested text segment.

The negative bias incurred by identified stop segments may be tempered in the second exemplary semantic model by the inclusion of suitable mathematical terms. In the equation above, for example, a constant term A is included in the denominator of the ratio to limit the effect of the combined probability. The value of the constant term A may be selected in accordance with design or user preference.

The second exemplary semantic model, according to the present invention, expresses probability of a tested text segment as the product of negative biasing terms. A negative biasing term in this example is any term that varies between zero and one based on probability of shared cluster occurrence between the tested text segment and a stop segment. The closer such a negative biasing term is to zero, the more it will reduce the product of biasing terms, and the more negative a bias it will cause in the second exemplary semantic model. In the second exemplary semantic model, the product may include one negative biasing term for each identified stop segment.

The second exemplary semantic model, adapted with M stop segments, may be implemented mathematically, using the following equation:

$$\Pr(w_i) = \prod_{j=1}^{M} \left[1 - \frac{B_j \Pr(w_i s_j | V)}{\Pr(w_i | V)} \right]$$

In the equation above, each negative biasing term is computed as the ratio between (1) the probability of shared cluster occurrence $\Pr(w_i s_j | V)$ between the tested text segment w_i and a stop

segment s_j, and (2) the probability of global cluster occurrence $Pr(w_i|V)$ of the tested text segment w_i.

During message recognition in accordance with the second exemplary semantic model, when implemented by the equation above, a high probability of any one stop segment occurring in the same semantic cluster as the tested text segment will cause one small negative biasing term to be included in the product. Consequently, the probability (here, the score) assigned to the tested text segment during hypothesis testing will be relatively low, effecting a negative bias based on the high probability of a single stop segment occurring in the same semantic cluster as the tested text segment.

In a semantic model according to various aspects of the present invention, the severity of negative bias effected by a particular stop segment may be varied depending on one or more factors. For example, a stop segment that has been identified as being outside a present context may be "downgraded with age" with the passage of time following the identification. As another example, the severity of negative bias may be downgraded (*i.e.*, less negative bias) with the generation of additional text following the identification. In the exemplary equation above, a bias limiting coefficient B_j is included to limit the negative effect of each biasing term, as desired.

A semantic model may be combined with a syntactic model using any conventional technique. Suitable combination techniques may include maximum entropy, backoff, linear interpolation, and linear combination. By way of example, a maximum entropy language model integrating N-gram (*i.e.*, syntactic) and topic dependencies is disclosed in a paper entitled "A Maximum Entropy Language Model Integrating N-Grams And Topic Dependencies For Conversational Speech Recognition," by Sanjeev Khudanpur and Jun Wu (Proceedings of ICASSP '99), incorporated herein by reference. By way of a further example, combination of models by linear interpolation and, alternatively, by backoff is disclosed in a paper entitled "A Class-Based Language Model For Large-Vocabulary Speech Recognition Extracted From Part-Of-Speech Statistics" by Christer Samuelsson and Wolfgang Reichl (Proceedings of ICASSP '99), incorporated herein by reference.

In a variation, a semantic model may be integrated with a syntactic model in a single, hybrid language model of the type disclosed in U.S. Patent 5,839,106 to Bellegarda, incorporated by reference above.

In a further variation, the second exemplary semantic model may be combined with a conventional syntactic model by treating the semantic model as a negative biasing factor to the syntactic model. In the combination, the semantic model may be appropriately limited such that even a text segment that is a stop word may be selected as the message recognizer's "best guess" if the segment is a very strong fit in the syntactic model. Such a combination may be implemented mathematically, using the equation below. In the equation, the left-hand product term $Pr(w_i|LM_{syn})$ is the probability assigned to the tested text segment by the conventional syntactic model.

$$\Pr(w_i) = \Pr(w_i|LM_{syn}) \prod_{j=1}^{M} \left[1 - \frac{B_j \Pr(w_i s_j|\mathrm{V})}{\Pr(w_i|\mathrm{V})} \right]$$

An example of the operation of system 200 may be better understood with reference to the data flow diagrams of FIGS. 4 and 5. Exemplary processes, described below with reference to these data flow diagrams, may be variously implemented with and without user intervention, in hardware and/or software. The example provided below illustrates the benefits of various aspects of the present invention when these aspects are employed in an exemplary embodiment and operation example. However, benefits of certain aspects may be obtained even when various other aspects are omitted. Thus, the example below should not be considered as limiting the scope of the invention in any way.

The operation of stylus 210, in the example, may be better understood with reference to the data flow diagram of FIG. 4. Process 410 determines activation status of stylus 210. When user 242 moves stylus 210 toward his or her head to begin dictation, process 410 positively asserts an activation signal to process 420. Process 420 provides a voice signal responsive to voice input from user 242. Process 420 provides an enabled voice signal to process 430 upon two conditions. The first condition is that the activation signal from process 410 has been positively

asserted to indicate that stylus 210 is situated to receive voice input from user 242. The second condition is that user 242 has provided voice input by speaking into the microphone of stylus 210.

Process 440 provides an identification signal based on a 48-bit stylus identification code 442. (A longer code may be used when the identification signal is employed for decryption.) Process 430 responds to the identification signal and to the enabled voice signal from process 420 to provide an electromagnetic signal. The electromagnetic signal suitably combines the identification signal and the voice signal. The electromagnetic signal is transmitted from stylus 210 to domain controller 220 (communications link 235).

The operation of domain controller 220, in the example, may be better understood with reference to the data flow diagram of FIG. 5. Process 510 extracts signal components from the electromagnetic signal provided by process 430. The identification signal identifies the source of the electromagnetic signal as stylus 210 and, consequently, the source of the voice signal as user 242.

Process 520 initializes local message model 316 in domain controller 220 to be in conformance with user message model 262. (Process 520 may employ any appropriate network protocol to transfer digital indicia of user message model 262.) Not shown in FIG. 5 is a process for initializing user message model 262 to be in conformance with local message model 316 after adaptation of local message model 316.

Process 530 performs speech recognition in accordance with initialized message model 316 to generate text data responsive to the voice signal. Process 540 performs handwriting recognition, also in accordance with initialized message model 316, to generate text data responsive to freehand input from user 242. Process 540 further interprets editing commands from user 242 responsive to freehand input. User 242 conveys freehand input by manipulating stylus 210 on a tablet surface (not specifically shown) of tablet 252.

Process 550 edits text generated by process 530 and process 540 responsive to editing commands interpreted by process 540. Editing may include user modification of text that has been correctly generated by processes 530 and 540, but which the user desires to modify. Editing may further include user training, conveyed by freehand input, voice input, and/or character input. User training may include correction of misrecognition by processes 530 and

540, which is conveyed back to processes 530 and 544 for adaptation of local message model 316. Correction conveyed back to either process adapts local message model 316. Process 550 provides text output for display on tablet 252.

The processes illustrated in the data flow diagrams of FIGS. 4 and 5 continue as user 242 continues providing voice and/or freehand input for generation and editing of text data.

Multiple displays, for example integrated with tablet surfaces of tablets, may be advantageously used to display multiple views of a single document in accordance with various aspects of the present invention. A first view of the document may be provided on a first display (*e.g.*, of a first tablet), while a second view of the document may be provided on a second display (*e.g.*, of a second tablet). Upon modification of the document, the first and second views are modified as needed to reflect the modification to the document.

When first and second tablets are networked together, modification made to the document by user input to the first tablet is communicated to the second tablet to modify the second view as needed to reflect the modification. Similarly, modification made to the document by user input to the second tablet is communicated to the first tablet to modify the first view as needed to reflect the modification.

An example of the use of multiple displays to provide multiple views of a single document may be better understood with reference to FIG. 15 (including FIGS. 15A and 15B). Tablet 252 is illustrated in FIG. 15A as displaying a first view of a graphical document 1500. The first view shows a circle 1510 and a rectangle 1520. A portion of the circle having a cutout 1512 is enclosed by a bounding box 1530.

Tablet 254 is illustrated in FIG. 15B as displaying a second view of document 1500. The second view shows a different portion of document 1500, namely the portion inside bounding box 1530. Cutout 1512 takes up most of the display of tablet 254.

Advantageously, modifications made to a portion of document 1500 inside bounding box 1530 (e.g., filling in of notch 1512) are displayed on both tablet 252 and tablet 254. The first view of document 1500, displayed on tablet 252, is updated according to various aspects of the invention to reflect modification made by user input to tablet 254. Modifications to the document may be centrally registered in a single data store, for example in domain controller

220. Alternatively, each tablet displaying a view of the document may update a complete copy of the document in a data store local to the tablet.

While the present invention has been described in terms of preferred embodiments and generally associated methods, it is contemplated that alterations and permutations thereof will become apparent to those skilled in the art upon a reading of the specification and study of the drawings. The present invention is not intended to be defined by the above description of preferred exemplary embodiments, nor by any of the material incorporated herein by reference. Rather, the present invention is defined variously by the issued claims. Each variation of the present invention is intended to be limited only by the recited limitations of its respective claim, and equivalents thereof, without limitation by terms not present therein.

~~The claims below are provided in the present provisional application to particularly point out some, but not all, of the subject matter described above that the Applicant regards as his invention.~~

What is claimed is:

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1. A system responsive to voice input and freehand input to generate and edit text, the system comprising:

(a) a stylus comprising:

(1) a pointer for communicating freehand input; and

(2) a microphone for receiving voice input;

(b) a speech recognizer responsive to voice input to provide text data;

(c) a first tablet interface including a first tablet surface, the first tablet interface being responsive to freehand input to provide indicia of editing commands; and

(d) an editor having access to the text data, responsive to the indicia of editing commands to modify the text data as specified by the editing commands.

2. The system of claim 1 wherein:

(a) the stylus has a proximal end and a distal end;

(b) the pointer is toward the distal end; and

(c) the microphone is toward the proximal end.

3. The system of claim 1 wherein the microphone is responsive to sound impinging on the stylus from the direction of the proximal end with a first sensitivity and from the direction of the

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distal end with a second sensitivity, the first sensitivity being significantly greater than the second sensitivity.

4. The system of claim 1 further comprising a first display integrated into the first tablet surface.

5. The system of claim 4 further comprising:

(a) a second tablet interface including a second tablet surface; and

(b) a second display integrated into the second tablet surface.

6. The system of claim 5 further comprising:

(a) a communications link interconnecting the displays; and

(b) a command interpreter for controlling the communications link, the command interpreter being responsive to the indicia of editing commands to transfer text data between the displays as specified by the editing commands.

7. The system of claim 1 wherein the speech recognizer is part of a message recognizer that further comprises a handwriting recognizer, the handwriting recognizer being responsive to freehand input to further provide text data.

8. The system of claim 7 wherein:

(c) the speech recognizer generates text data in accordance with an acoustic model and a shared language model; and

(d) the handwriting recognizer generates text data in accordance with a handwriting model and the shared language model; and

(e) the message recognizer is responsive to the indicia of editing commands to adapt at least the shared language model.

9. The system of claim 8 further comprising a character interface responsive to character input communicated via the pointing interface to provide character data, wherein the shared language model is adaptable by a correction process comprising:

specifying, responsive to freehand input, a selection of text generated by the message recognizer;

initiating a correction mode for modifying the selection;

providing a list of alternative text comparable to the selection;

updating the list based on character data communicated after initiation of the correction mode;

modifying the selection responsive to character data; and

adapting the shared language model in accordance with the modification to the selection.

10. The system of claim 1 wherein:

(a) the speech recognizer provides text data in accordance with at least one model; and

(b) the speech recognizer is responsive to the indicia of editing commands to adapt the model.

11. The system of claim 10 further comprising a character interface responsive to character input communicated via the pointing interface to provide character data, wherein the speech recognizer provides text data in accordance with at least a syntactic model that is adaptable by a correction process comprising:

specifying, responsive to freehand input, a selection of text generated by the speech recognizer;

initiating a correction mode for modifying the selection;

providing a list of alternative text comparable to the selection;

updating the list based on character data communicated after initiation of the correction mode;

modifying the selection responsive to character data; and

adapting the model in accordance with the modification to the selection.

12. The system of claim 10 wherein:

(c) the speech recognizer provides text data in accordance with at least a semantic model, the model comprising a plurality of semantic clusters; and

(d) the semantic model is adaptable by a process comprising:

listing a plurality of text segments having a low probability of shared cluster occurrence;

selecting, responsive to freehand input, at least one text segment of the plurality; and

adapting the semantic model to bias against text segments having a high probability of

shared cluster occurrence with each selected text segment.

13. The system of claim 10 wherein:

(a) the speech recognizer provides text data in accordance with at least a semantic model, the semantic model comprising a plurality of semantic clusters; and

(b) the semantic model is adaptable by a process comprising:

generating a maximum likelihood text segment responsive to voice input;

listing at least one alternative text segment, the maximum likelihood text segment and each alternative text segment forming a plurality of text segments, each text segment of the plurality having a high probability of global cluster occurrence and a low probability of shared cluster occurrence;

selecting, responsive to freehand input, at least one text segment of the plurality; and

adapting the semantic model to apply a negative bias against a tested text segment, the severity of the bias being proportional to the probability of shared cluster occurrence between the tested text segment and the selected text segment or segments.

14. The system of claim 13 wherein the bias is inversely proportional to the probability of global cluster occurrence of the tested text segment.

15. The system of claim 13 wherein the bias is inversely proportional to the amount of text data separating the tested text segment and the selected text segment or segments.

16. The system of claim 1 wherein the stylus further comprises an identification circuit for

providing, to the speech recognizer, an identification of an owner of the stylus.

17. The system of claim 1 wherein the stylus further comprises an activation circuit for automatically activating the speech recognizer.

18. The system of claim 17 wherein the activation circuit comprises:

(a) a first sound sensor responsive to sound impinging on the stylus within a first angular range to provide a first sensing signal;

(b) a second sound sensor responsive to sound impinging on the stylus outside the first angular range to provide a second sensing signal; and

(c) a comparator for comparing the first and second sensing signals.

19. The system of claim 17 wherein the activation circuit comprises a proximity sensor, responsive to proximity of the microphone to a human head, for controlling activation of the speech recognizer by the activation circuit.

20. The system of claim 19 wherein the proximity sensor comprises a radiation sensor responsive to field radiation impinging on the stylus.

21. The system of claim 20 wherein the radiation sensor is responsive to electromagnetic field radiation in the infrared spectrum.

22. The system of claim 20 wherein:

(a) the radiation sensor is responsive to field radiation impinging on the stylus within a first angular range to provide a first sensing signal and within a second angular range to provide a second sensing signal; and

(b) the proximity sensor further comprises a comparator for comparing the first and second sensing signals.

23. The system of claim 22 wherein:

(a) the activation circuit is configured to activate the speech recognizer when the microphone is at a predetermined proximity to the human head, wherein the microphone is:

(1) oriented toward the human head within a predetermined angular range; and

(2) displaced from the human head within a predetermined separation range;

(b) the second angular range falls completely within the first angular range; and

(c) the predetermined proximity is determined by all of at least two conditions being true, wherein the conditions are:

(1) the amplitude of the second sensing signal reaching a first predetermined threshold; and

(2) the ratio between the amplitude of the second sensing signal and the amplitude difference between the first and second sensing signals reaching a second predetermined threshold.

24. The system of claim 20 wherein the radiation sensor is responsive to acoustic field radiation, the system further comprising:

(a) an ultrasonic transmitter for sending acoustic field radiation to the human head, such that the radiation sensor provides a time-varying signal descriptive of reflected acoustic field radiation impinging on the stylus from the human head;

(b) a signal processor responsive to the time-varying signal so as to provide a distance profile of the acoustic field radiation; and

(c) a comparator for comparing the distance profile to an expected profile, the expected profile corresponding to acoustic field radiation expected to impinge on the stylus from the human head when the microphone is at a predetermined proximity to the human head.

25. A system responsive to voice input and freehand input to generate and edit text, the system comprising:

(a) a stylus comprising:

(1) a pointer for communicating freehand input; and

(2) a microphone for receiving voice input;

(b) at least one speech recognizer responsive to voice input to provide text data;

(c) a plurality of tablet interfaces, each including a respective tablet surface and being responsive to freehand input to provide indicia of editing commands;

(d) a plurality of displays, each being integrated into a respective tablet surface; and

(e) at least one editor having access to the text data, responsive to the indicia of editing commands to modify the text data as specified by the editing commands.

26. The system of claim 25 further comprising:

(a) a communications link interconnecting the displays; and

(b) a command interpreter for controlling the communications link, the command interpreter being responsive to the indicia of editing commands to transfer text data between the displays as specified by the editing commands.

27. A method for processing text, the method comprising:

providing a stylus comprising a pointing interface and a microphone;

providing a tablet responsive to the pointing interface;

generating text by dictating into the microphone; and

editing text by manually manipulating the pointing interface on the tablet.

28. The method of claim 27 further comprising:

moving the stylus across visual indicia of dictated text that has been erroneously generated to specify a selection from the text; and

correcting the selection.

29. The method of claim 28 further comprising:

generating text in accordance with an adaptable language model; and

adapting the language model responsive to the correction of the selection.

30. The method of claim 29 further comprising:

providing a character interface responsive to the pointing interface;

providing a list of alternative text comparable to the selection;

updating the list based on character input communicated after specification of the selection;

modifying the selection responsive to character input communicated via the pointing interface; and

adapting the language model in accordance with the modification to the selection.

31. The method of claim 29 wherein the language model comprises a syntactic model and a semantic model, the semantic model comprising a plurality of semantic clusters, the method further comprising:

listing a plurality of text segments having a low probability of shared cluster occurrence;

selecting, responsive to freehand input, at least one text segment of the plurality; and

adapting the semantic model to bias against text segments having a high probability of shared cluster occurrence with each selected text segment.

32. The method of claim 29 wherein the language model comprises a syntactic model and a semantic model, the semantic model comprising a plurality of semantic clusters, the method further comprising:

generating a maximum likelihood text segment responsive to voice input;

listing at least one alternative text segment, the maximum likelihood text segment and each alternative text segment forming a plurality of text segments, each text segment of the plurality having a high probability of global cluster occurrence and a low probability of shared cluster occurrence;

selecting, responsive to freehand input, at least one text segment of the plurality; and

adapting the semantic model to apply a negative bias against a tested text segment, the severity of the bias being proportional to the probability of shared cluster occurrence between the tested text segment and the selected text segment or segments.

33. The method of claim 32 wherein the bias is inversely proportional to the probability of global cluster occurrence of the tested text segment.

34. The method of claim 32 wherein the bias is inversely proportional to the amount of text data separating the tested text segment and the selected text segment or segments.

35. The method of claim 27 further comprising sending an identification signal to the speech recognizer to identify the stylus.

36. The method of claim 27 further comprising activating the speech recognizer by moving the stylus within a predetermined proximity of a human head.

37. A stylus comprising:

(a) a stylus body having a proximal end and a distal end;

(b) a pointing interface toward the distal end;

(c) an identification circuit for providing an identification signal; and

(d) a wireless transmitter for transmitting an electromagnetic signal comprising the voice signal and the identification signal.

38. The stylus of claim 37 further comprising a microphone toward the proximal end for providing a voice signal responsive to voice input, wherein the electromagnetic signal further comprises the voice signal.

39. The stylus of claim 38 wherein the identification signal and the voice signal are time-division multiplexed on the electromagnetic signal.

40. The stylus of claim 37 wherein the microphone is responsive to sound impinging on the stylus from the direction of the proximal end with a first sensitivity and from the direction of the distal end with a second sensitivity, the first sensitivity being significantly greater than the second sensitivity.

41. The stylus of claim 37 further comprising an activation circuit for automatically enabling the voice signal.

42. The stylus of claim 41 wherein the activation circuit comprises a proximity sensor, responsive to proximity of the microphone to a human head, for controlling enabling of the voice signal by the activation circuit.

43. A stylus comprising:

(a) a stylus body having a proximal end and a distal end;

(b) a pointing interface toward the distal end;

(c) a microphone toward the proximal end for providing a voice signal responsive to voice

input;

(d) an activation circuit for automatically enabling the voice signal; and

(e) a wireless transmitter for transmitting an electromagnetic signal comprising the voice signal.

44. The system of claim 43 wherein the activation circuit comprises:

(a) a first sound sensor responsive to sound impinging on the stylus within a first angular range to provide a first sensing signal;

(b) a second sound sensor responsive to sound impinging on the stylus outside the first angular range to provide a second sensing signal; and

(c) a comparator for comparing the first and second sensing signals.

45. The system of claim 43 wherein the activation circuit comprises a proximity sensor, responsive to proximity of the microphone to a human head, for controlling the enabling of the voice signal.

46. The system of claim 45 wherein the proximity sensor comprises a radiation sensor responsive to field radiation impinging on the stylus.

47. The system of claim 46 wherein the radiation sensor is responsive to electromagnetic field radiation in the infrared spectrum.

48. The system of claim 46 wherein:

(a) the radiation sensor is responsive to field radiation impinging on the stylus within a first angular range to provide a first sensing signal and within a second angular range to provide a second sensing signal; and

(b) the proximity sensor further comprises a comparator for comparing the first and second sensing signals.

49. The system of claim 48 wherein:

(a) the activation circuit is configured to enable the voice signal when the microphone is at a predetermined proximity to the human head, wherein the microphone is:

(1) oriented toward the human head within a predetermined angular range; and

(2) displaced from the human head within a predetermined separation range;

(b) the second angular range falls completely within the first angular range; and

(c) the predetermined proximity is determined by all of at least two conditions being true, wherein the conditions are:

(1) the amplitude of the second sensing signal reaching a first predetermined threshold; and

(2) the ratio between the amplitude of the second sensing signal and the amplitude difference between the first and second sensing signals reaching a second predetermined threshold.

50. The system of claim 46 wherein the radiation sensor is responsive to acoustic field radiation, the system further comprising:

(a) an ultrasonic transmitter for sending acoustic field radiation to the human head, such that the radiation sensor provides a time-varying signal descriptive of reflected acoustic field radiation impinging on the stylus from the human head;

(b) a signal processor responsive to the time-varying signal so as to provide a distance profile of the acoustic field radiation; and

(c) a comparator for comparing the distance profile to an expected profile, the expected profile corresponding to acoustic field radiation expected to impinge on the stylus from the human head when the microphone is at a predetermined proximity to the human head.

51. A method for message recognition in accordance with at least a semantic language model, the method comprising performing a plurality of hypothesis tests between a plurality of text segments and at least one stop segment, each hypothesis test including computing a probability according to the equation:

$$\Pr(w_i) = \sum_{k=1}^{M} \left[\frac{\Pr(w_i|C_k)}{A + \sum_{j=1}^{L} B_j \Pr(s_j|C_k)} \right]$$

wherein w_i is the text segment being tested, C_k is a semantic cluster from a plurality of semantic clusters, and B_j is a weighting factor for a respective stop segment.

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The system of claim 25 wherein the speech

52. ~~In a message~~ recognizer includes a semantic language model comprising a plurality of semantic clusters, the language model being adaptable by a process comprising the steps of:

(a) listing a plurality of text segments;

(b) selecting, ~~responsive to a first type of input,~~ at least one text segment of the plurality; and

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(c) adapting the semantic model to bias against text segments having a high probability of shared cluster occurrence with each selected text segment.

53. The language model of claim 52 wherein the listed text segments have a low probability of shared cluster occurrence.

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54. The language model of claim ~~52~~ wherein:

the context identification further comprises generating a maximum likelihood text segment responsive to a second type of input;

said step (a) further comprises listing at least one alternative text segment, the maximum likelihood text segment and each alternative text segment forming a plurality of text segments, each text segment of the plurality having a high probability of global cluster occurrence and a low probability of shared cluster occurrence;

said step (b) further comprises selecting, responsive to the first type of input, at least one text segment of the plurality; and

said step (c) further comprises adapting the semantic model to apply a negative bias against a tested text segment, the severity of the bias being proportional to the probability of shared cluster occurrence between the tested text segment and the selected text segment or segments.

55. The language model of claim 54 wherein:

(a) the first type of input is freehand input; and

(b) the second type of input is voice input.

56. The language model of claim 54 wherein the bias is inversely proportional to the probability of global cluster occurrence of the tested text segment.

57. The language model of claim 54 wherein the bias is inversely proportional to the amount of text data separating the tested text segment and the selected text segment or segments.

58. A method for adapting a semantic language model comprising a plurality of semantic clusters, the method comprising the steps of:

(a) listing a plurality of text segments having a low probability of shared cluster occurrence;

(b) selecting ~~responsive to freehand input~~ at least one text segment of the plurality; and GS 7/14/00

(c) adapting the semantic model to bias against text segments having a high probability of shared cluster occurrence with each selected text segment.

59. The method of claim 58 wherein:

the context identification further comprises generating a maximum likelihood text segment responsive to voice input;

said step (a) further comprises listing at least one alternative text segment, the maximum likelihood text segment and each alternative text segment forming a plurality of text segments, each text segment of the plurality having a high probability of global cluster occurrence and a low probability of shared cluster occurrence;

said step (b) further comprises selecting, responsive to freehand input, at least one text segment of the plurality; and

said step (c) further comprises adapting the semantic model to apply a negative bias against a tested text segment, the severity of the bias being proportional to the probability of shared cluster occurrence between the tested text segment and the selected text segment or segments.

60. The method of claim 59 wherein the bias is inversely proportional to the probability of global cluster occurrence of the tested text segment.

61. The method of claim 59 wherein the bias is inversely proportional to the amount of text data separating the tested text segment and the selected text segment or segments.

62. A system for generating text responsive to message input of a first type and a second type, the system comprising:

(a) a unified message model including:

(1) a shared language model;

(2) a first model specific to a first type of message recognition; and

(3) a second model specific to a second type of message recognition;

(b) a first message recognizer, responsive to the first type of message input to provide text data in accordance with both the shared language model and the first model; and

(c) a second message recognizer, responsive to the second type of message input to provide

text data in accordance with both the shared language model and the second model.

63. The system of claim 62 wherein:

(a) the first message recognizer is a speech recognizer, the first type of message input is voice input, and the first model is an acoustic model; and

(b) the second message recognizer is a handwriting recognizer, the second type of message input is freehand input, and the second model is a handwriting model.

64. The system of claim 62 wherein the shared language model comprises a syntactic model and a semantic model.

65. The system of claim 62 wherein the message model is a local message model, and wherein the system further comprises a network node for establishing a network connection to a user message model such that the local message model may be initialized to be in conformance with the user message model.

66. The system of claim 65 wherein the network node connects to a wide area network.

67. A method for recognizing a message input from a specific user, the method comprising:

providing:

(1) a local message model responsive to initialization by a user message model;

(2) a network including a first node and a second node, the first node being proximate the user and the second node being proximate the user message model; and

identifying the specific user to establish a connection on the network between the local message model and the user message model;

transferring data on the connection to modify the local message model to be in conformance with the user message model; and

recognizing message input from the user in accordance with the initialized local message model.

68. The method of claim 67 further comprising:

after modifying the local message model to be in conformance with the user message model, adapting the local message model in accordance with editing commands from the user; and

transferring data on the connection to modify the user message model to be in conformance with the adapted local message model.

69. The method of claim 67 wherein the local message model is implemented in a speech recognizer that is proximate the first node.

70. The method of claim 67 wherein:

(a) the message input comprises voice input; and

(b) the local message model comprises a language model and an acoustic model.

71. The method of claim 67 wherein:

(a) the message input comprises freehand input; and

(b) the local message model comprises a language model and a handwriting model.

72. The method of claim 67 wherein:

(a) the message input comprises voice input and freehand input; and

(b) the local message model comprises a language model, an acoustic model, and a handwriting model.

73. The system of claim 67 wherein the specific user is identified by an identification circuit in a stylus employed by the user to convey message input.

74. The system of claim 67 wherein the network is a wide area network.

75. A system responsive to voice input and freehand input to generate and edit text, the system comprising:

(a) a stylus comprising:

(1) a pointer for communicating freehand input; and

(2) a microphone for receiving voice input;

(b) means for generating text data responsive to voice input; and

(c) means for editing the text data responsive to freehand input.

76. A method for displaying a document, the method comprising:

displaying a first view of the document on a first display;

displaying a second view of the document on a second display; and

upon modification of the document, modifying the first and second views as needed to reflect the modification.

77. The method of claim 76 wherein:

(a) the first display is integrated into a tablet surface of a first tablet;

(b) the second display is integrated into a tablet surface of a second tablet; and

(c) the first and second tablets are coupled together such that:

(1) modification made to the document by user input to the first tablet is communicated to the second tablet to modify the second view as needed to reflect the modification; and

(2) modification made to the document by user input to the second tablet is communicated to the first tablet to modify the first view as needed to reflect the modification.

78. A text processing system comprising:

(a) a stylus having a proximal end and a distal end, the stylus comprising:

(1) a pointer toward the distal end for communicating freehand input;

(2) a microphone toward the proximal end for receiving voice input;

(3) an activation circuit for automatically activating the speech recognizer; and

(4) an identification circuit for providing, to the speech recognizer, an identification of the stylus;

(b) a tablet interface, responsive to freehand input, comprising a plurality of tablet surfaces;

(c) a plurality of self-contained enclosures, each of the enclosures comprising:

(1) a front face having a height and a width, the front face comprising a respective one of the tablet surfaces; and

(2) a back face, separated from the front face by a depth, the depth being significantly less than either the height or the width;

(d) a display comprising a plurality of displays, each of the displays being integrated into a respective tablet surface;

(e) a wireless transmitter and a wireless receiver for effecting a communications link to interconnect the displays;

(f) a command interpreter for controlling the communications link, the command interpreter being responsive to command indicia communicated via freehand input to transfer text between the displays; and

(g) a speech recognizer responsive to voice input to generate text in accordance with a language model specific to an owner of the stylus, for display on the display.

79. The method of claim 52 wherein selecting at least one text segment of the plurality is performed responsive to a first type of input.

80. The method of claim 58 wherein selecting at least one text segment of the plurality is performed responsive to freehand input.

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ABSTRACT

A system is disclosed for generating text responsive to both voice and handwriting input, including a microphone, stylus, and a tablet having an flat-panel display integrated into its surface. The system performs speech and handwriting recognition using a shared language model, which in one embodiment is trainable responsive to user correction of errors ineither speech or handwriting recognition. Various other systems and methods are also disclosed.

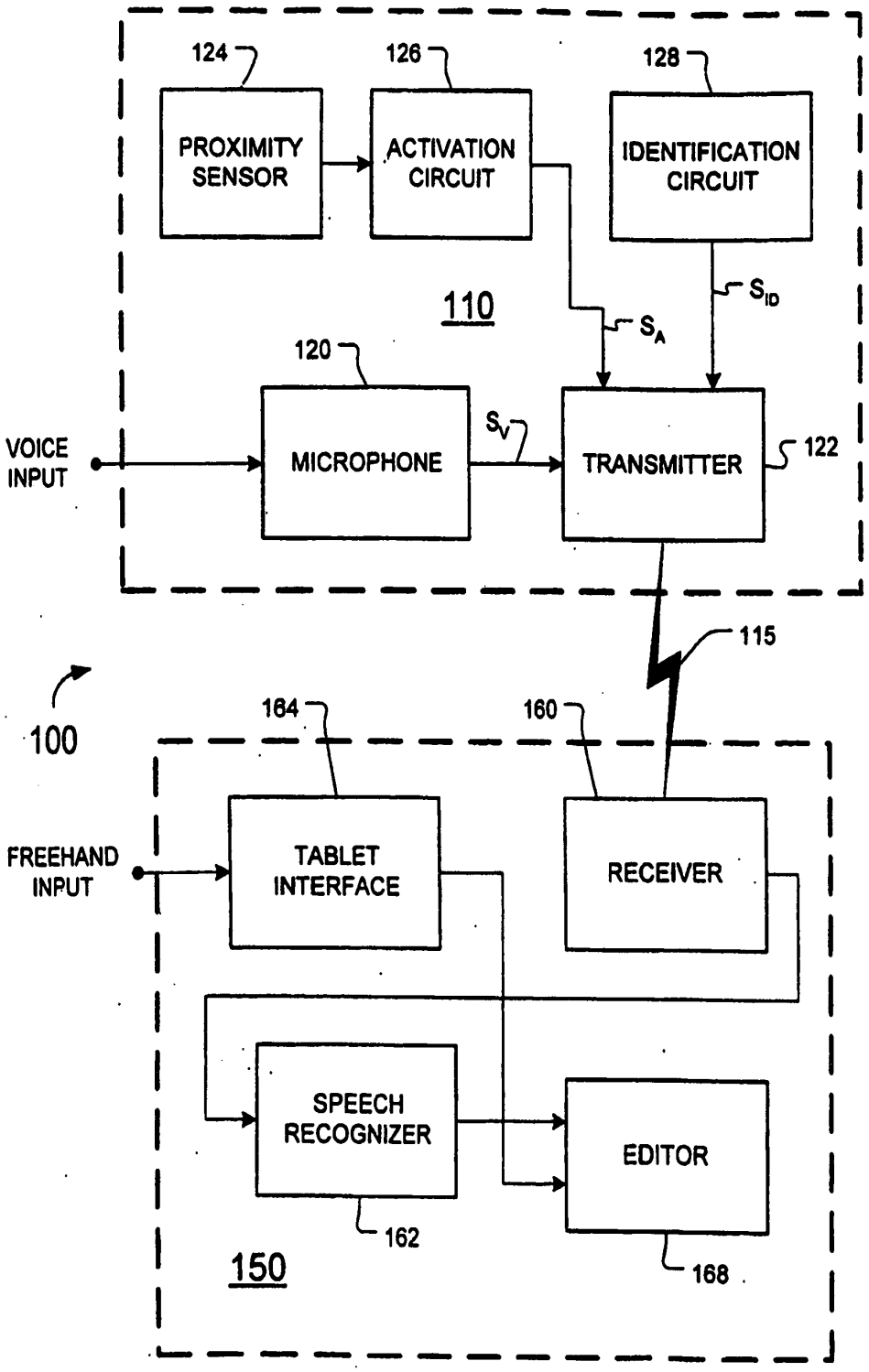

124
126
128
PROXIMITY SENSOR
ACTIVATION CIRCUIT
IDENTIFICATION CIRCUIT
110
S_{ID}
S_A
120
VOICE INPUT
MICROPHONE
S_V
TRANSMITTER
122
115
100
164
160
FREEHAND INPUT
TABLET INTERFACE
RECEIVER
SPEECH RECOGNIZER
EDITOR
162
150
168

FIG. 1A

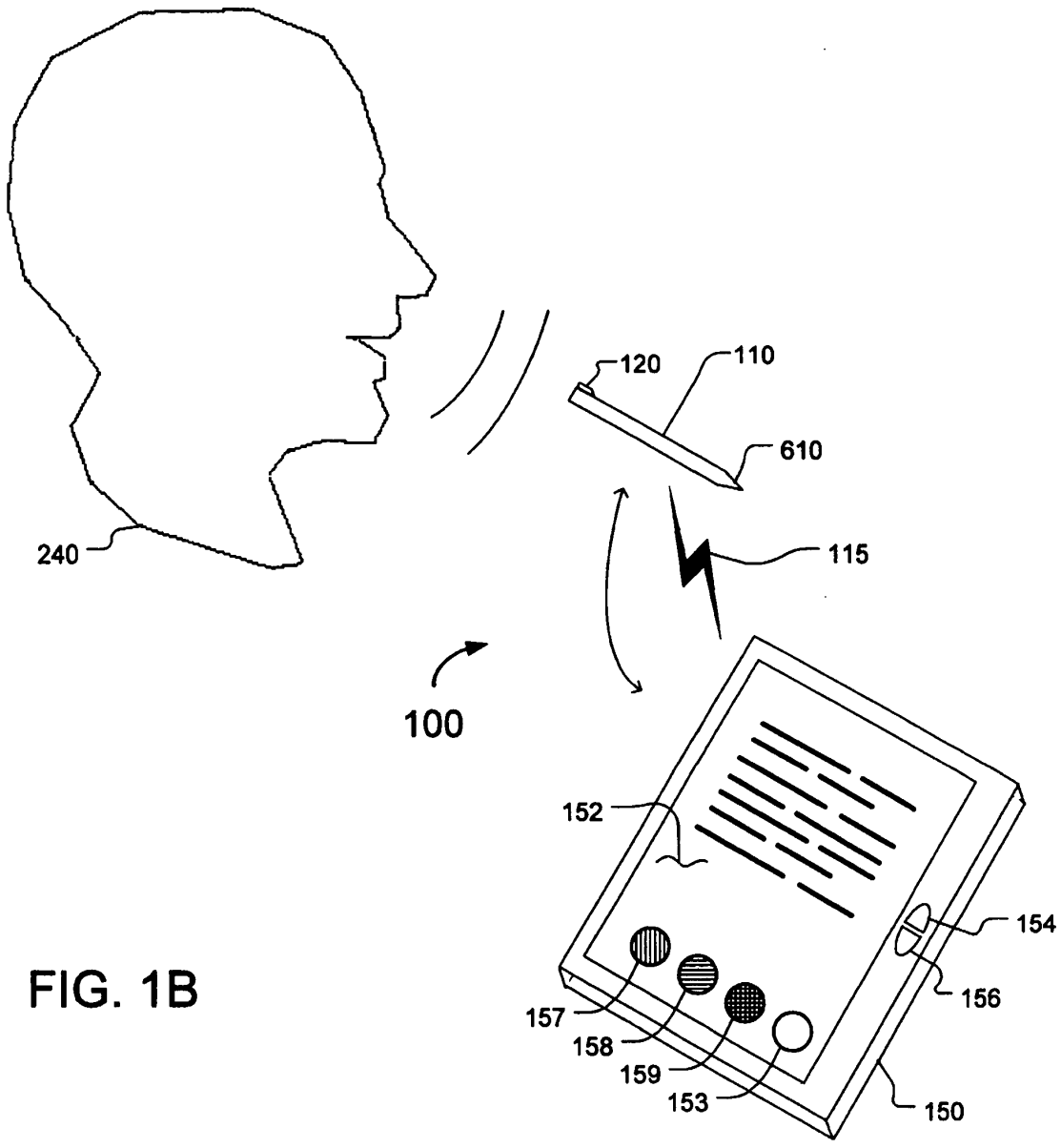


FIG. 1B

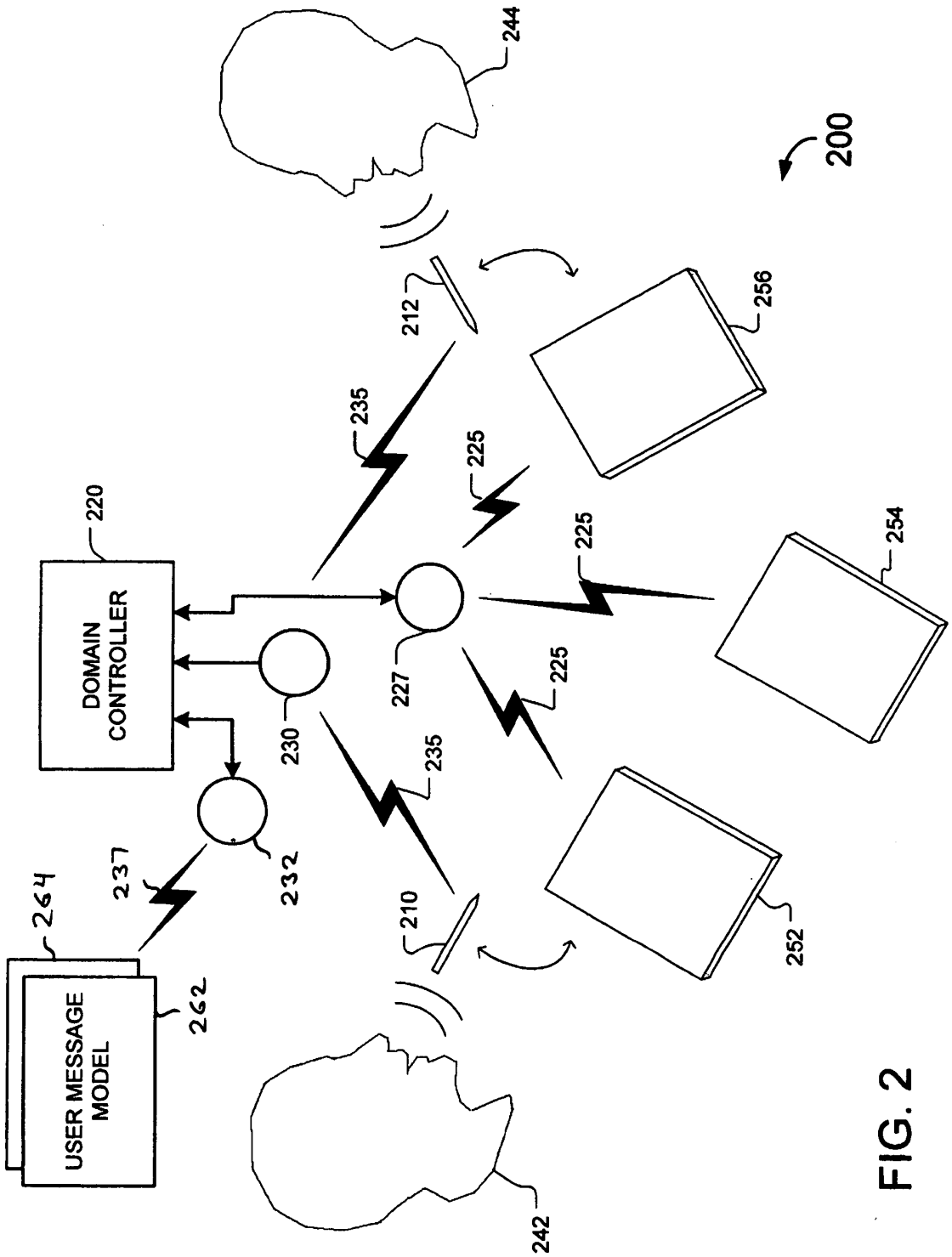
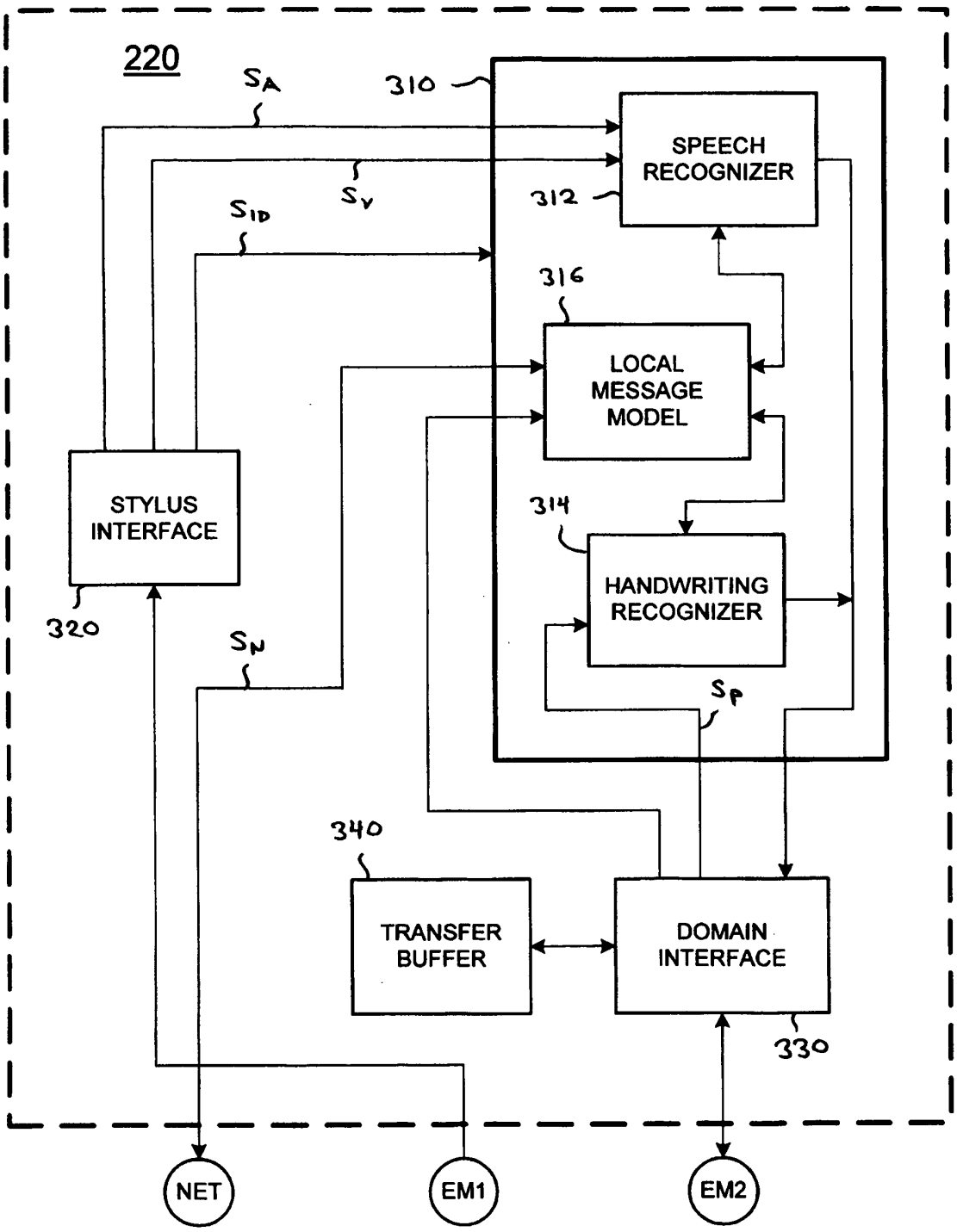

200
244
212
256
235
225
220
DOMAIN CONTROLLER
225
254
227
225
230
235
237
232
264
210
252
USER MESSAGE MODEL
262
242

FIG. 2

FIG. 3A


220
S_A
310
SPEECH RECOGNIZER
S_V
312
S_{ID}
316
LOCAL MESSAGE MODEL
STYLUS INTERFACE
314
HANDWRITING RECOGNIZER
320
S_N
S_P
340
TRANSFER BUFFER
DOMAIN INTERFACE
330
NET
EM1
EM2

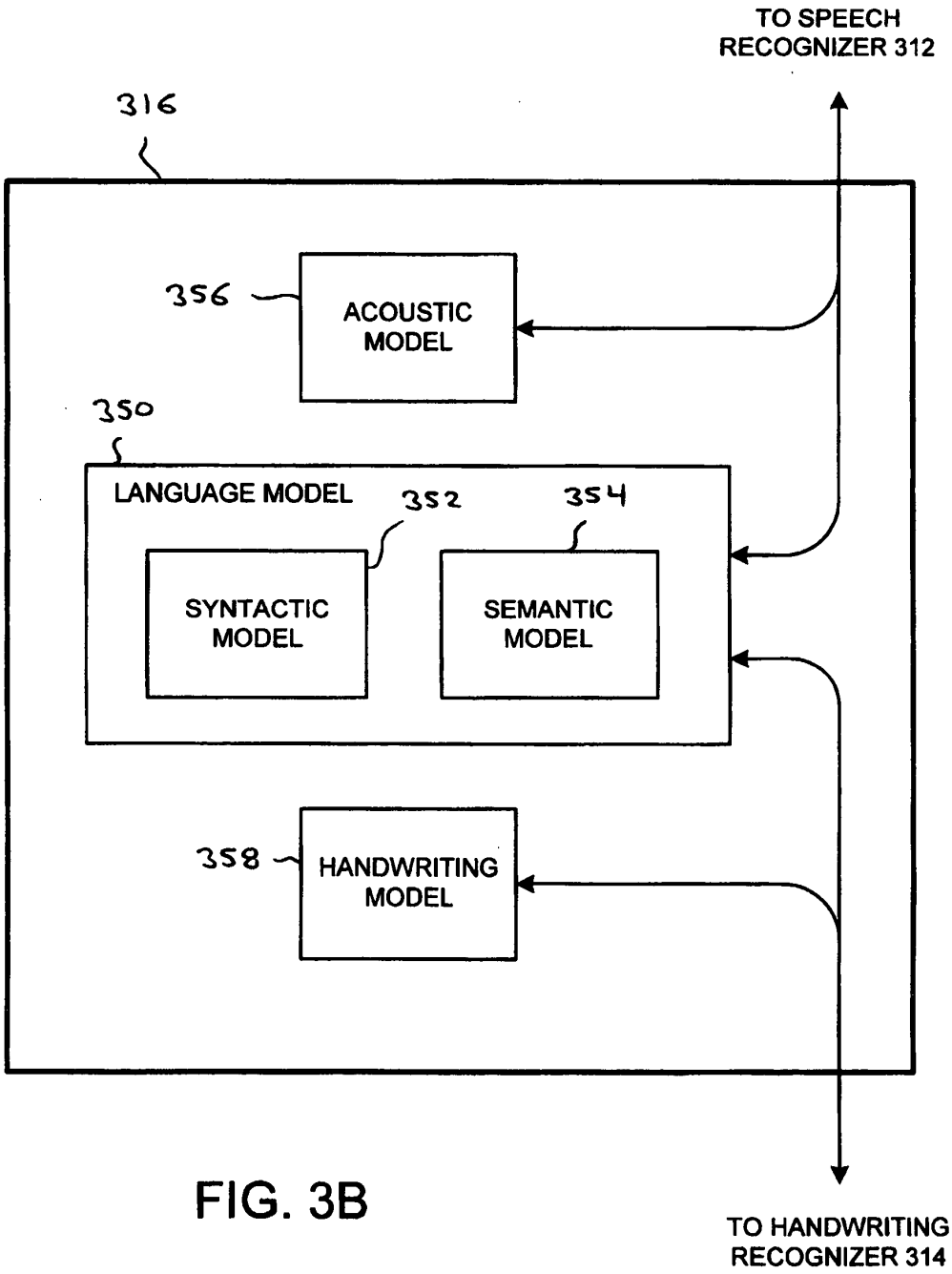

TO SPEECH RECOGNIZER 312
316
356
ACOUSTIC MODEL
350
LANGUAGE MODEL
352
354
SYNTACTIC MODEL
SEMANTIC MODEL
358
HANDWRITING MODEL
TO HANDWRITING RECOGNIZER 314

FIG. 3B

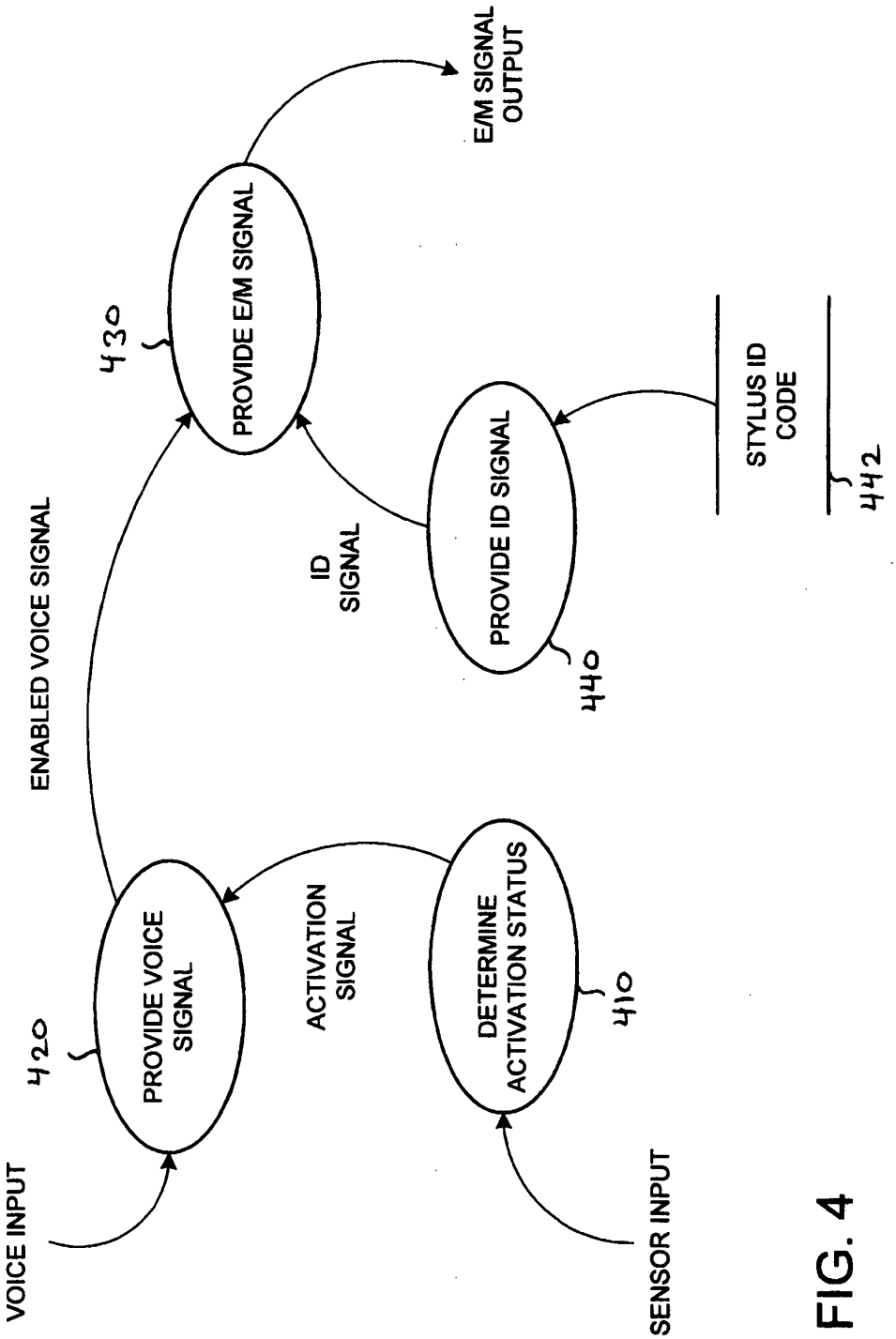
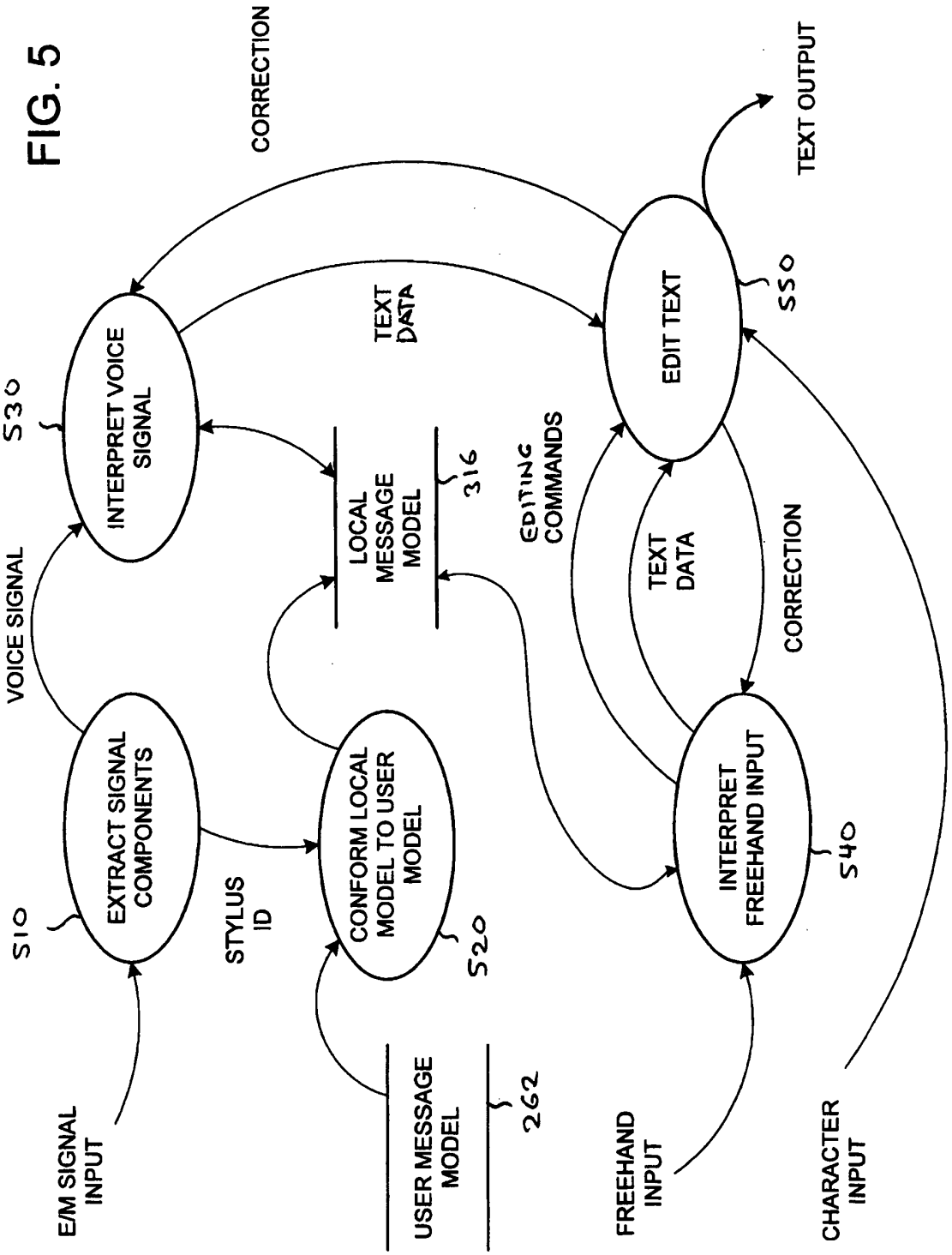

VOICE INPUT
420
PROVIDE VOICE SIGNAL
ENABLED VOICE SIGNAL
430
PROVIDE E/M SIGNAL
E/M SIGNAL OUTPUT
ACTIVATION SIGNAL
DETERMINE ACTIVATION STATUS
410
ID SIGNAL
PROVIDE ID SIGNAL
440
STYLUS ID CODE
442
SENSOR INPUT

FIG. 4

FIG. 5


E/M SIGNAL INPUT
510
EXTRACT SIGNAL COMPONENTS
VOICE SIGNAL
STYLUS ID
INTERPRET VOICE SIGNAL
530
CORRECTION
CONFORM LOCAL MODEL TO USER MODEL
520
USER MESSAGE MODEL
262
LOCAL MESSAGE MODEL
316
TEXT DATA
EDITING COMMANDS
EDIT TEXT
550
TEXT OUTPUT
TEXT DATA
CORRECTION
INTERPRET FREEHAND INPUT
540
FREEHAND INPUT
CHARACTER INPUT

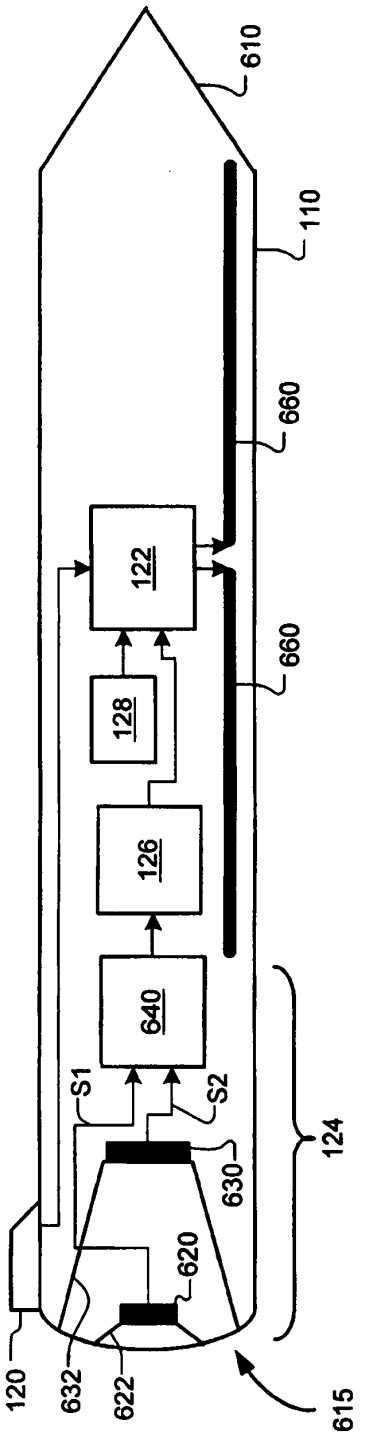

610
110
660
660
122
128
126
640
S1
S2
630
620
124
120
632
622
615

FIG. 6A

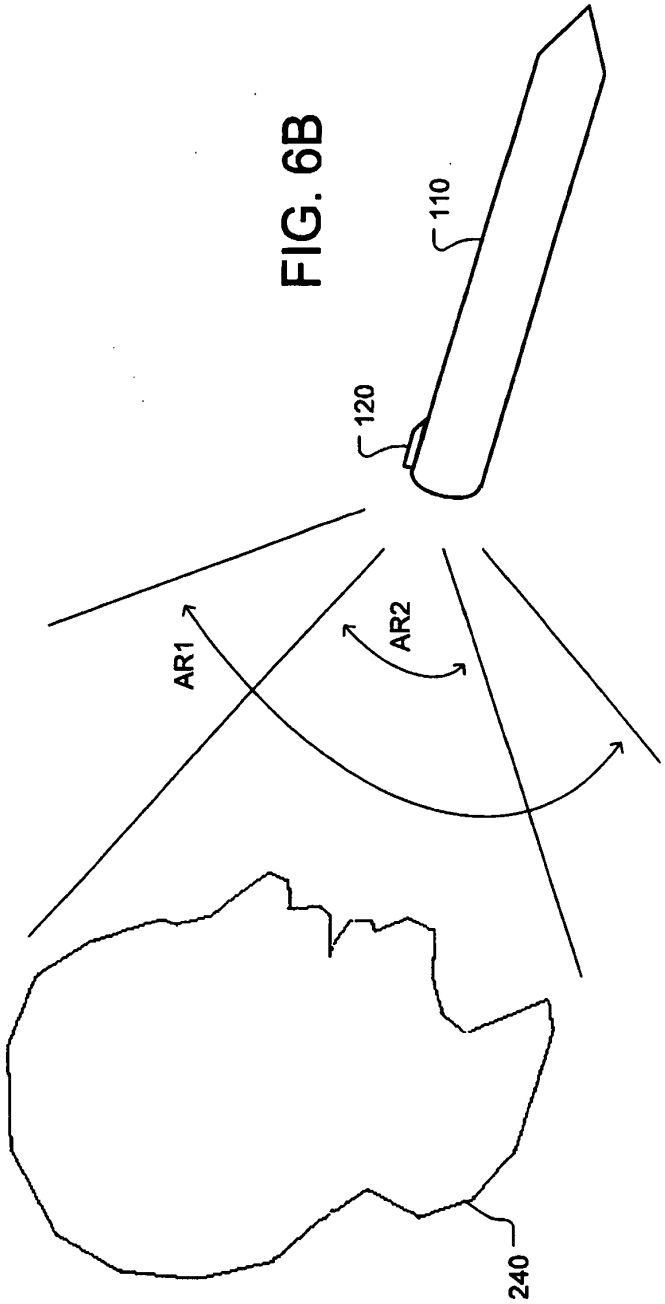

110
120
AR1
AR2
240

FIG. 6B

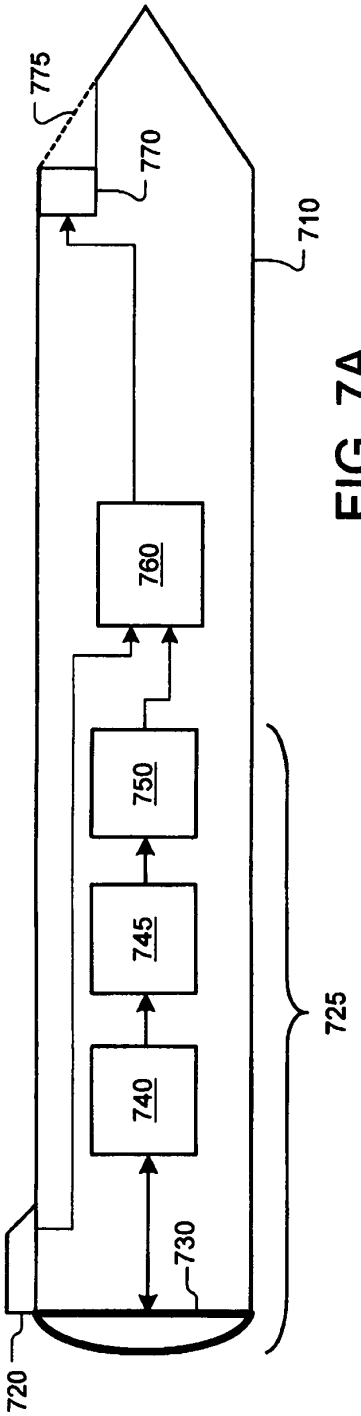


FIG. 7A

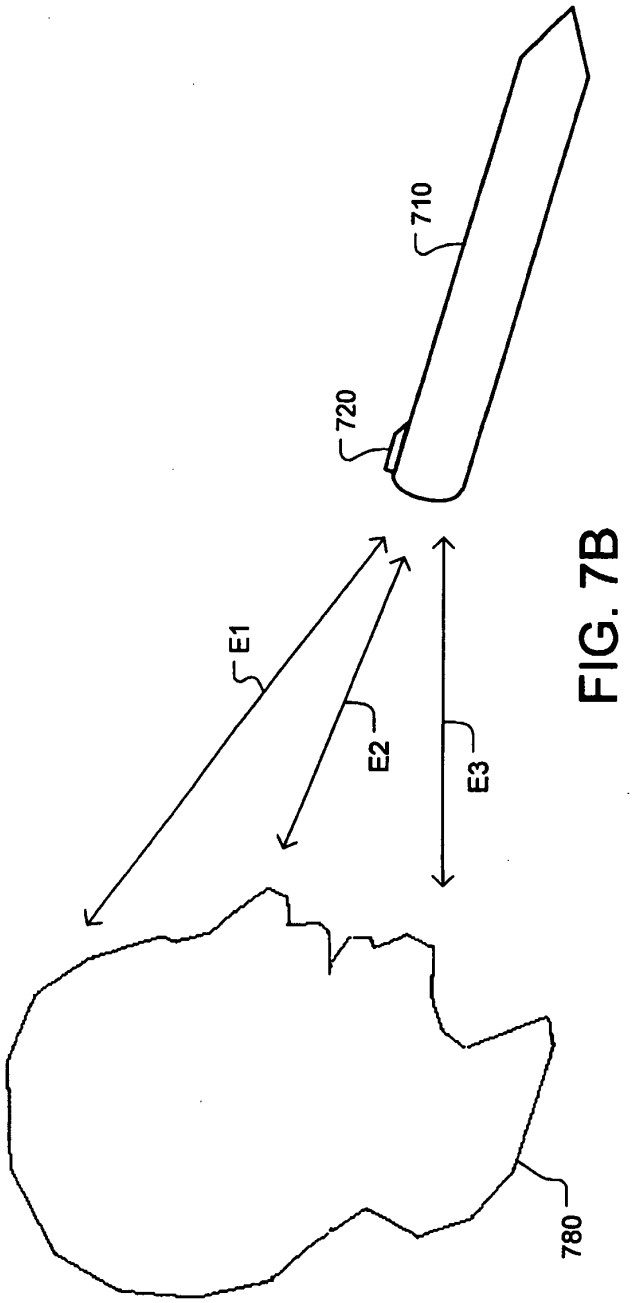


FIG. 7B

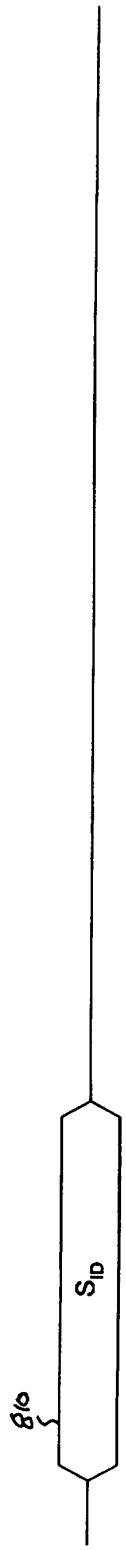


FIG. 8A

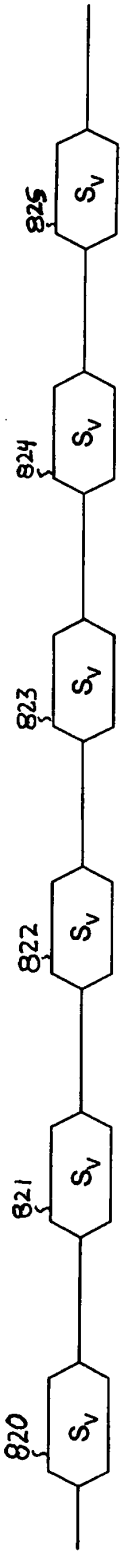


FIG. 8B

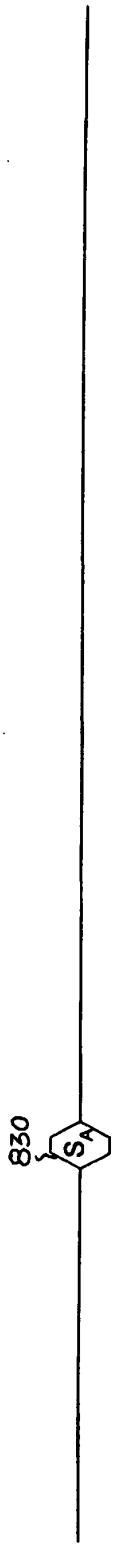


FIG. 8C

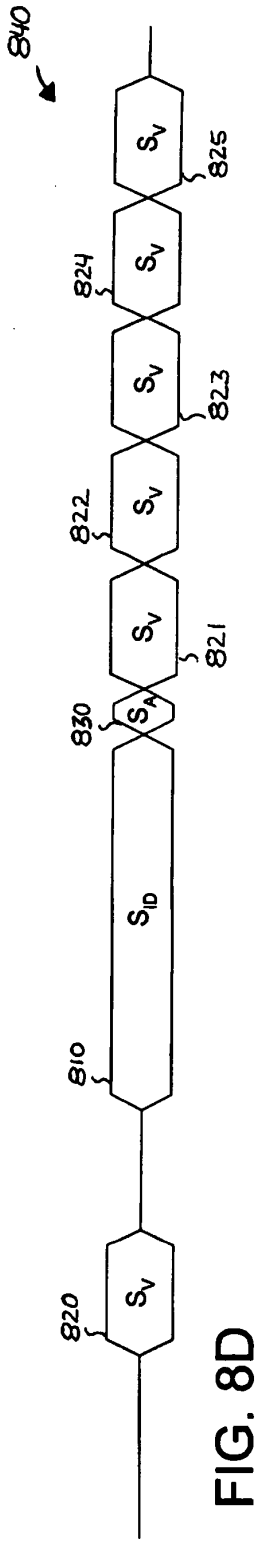
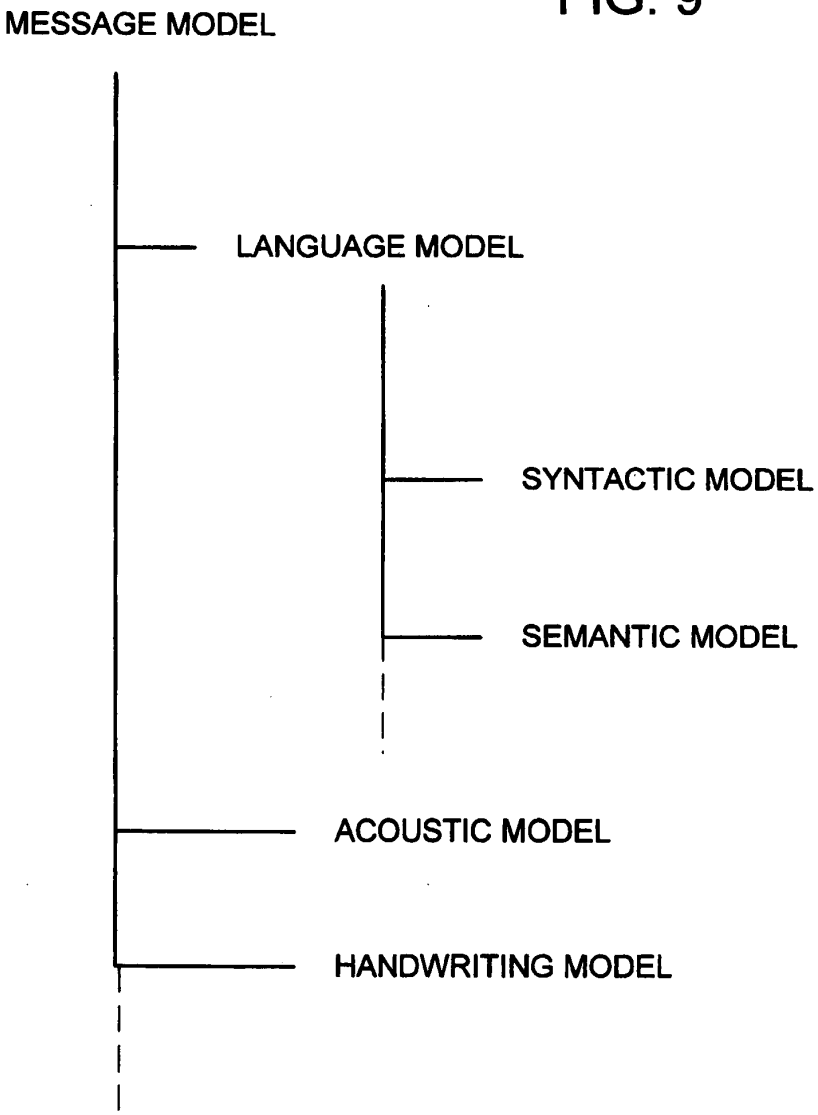


FIG. 8D

FIG. 9


MESSAGE MODEL
LANGUAGE MODEL
SYNTACTIC MODEL
SEMANTIC MODEL
ACOUSTIC MODEL
HANDWRITING MODEL

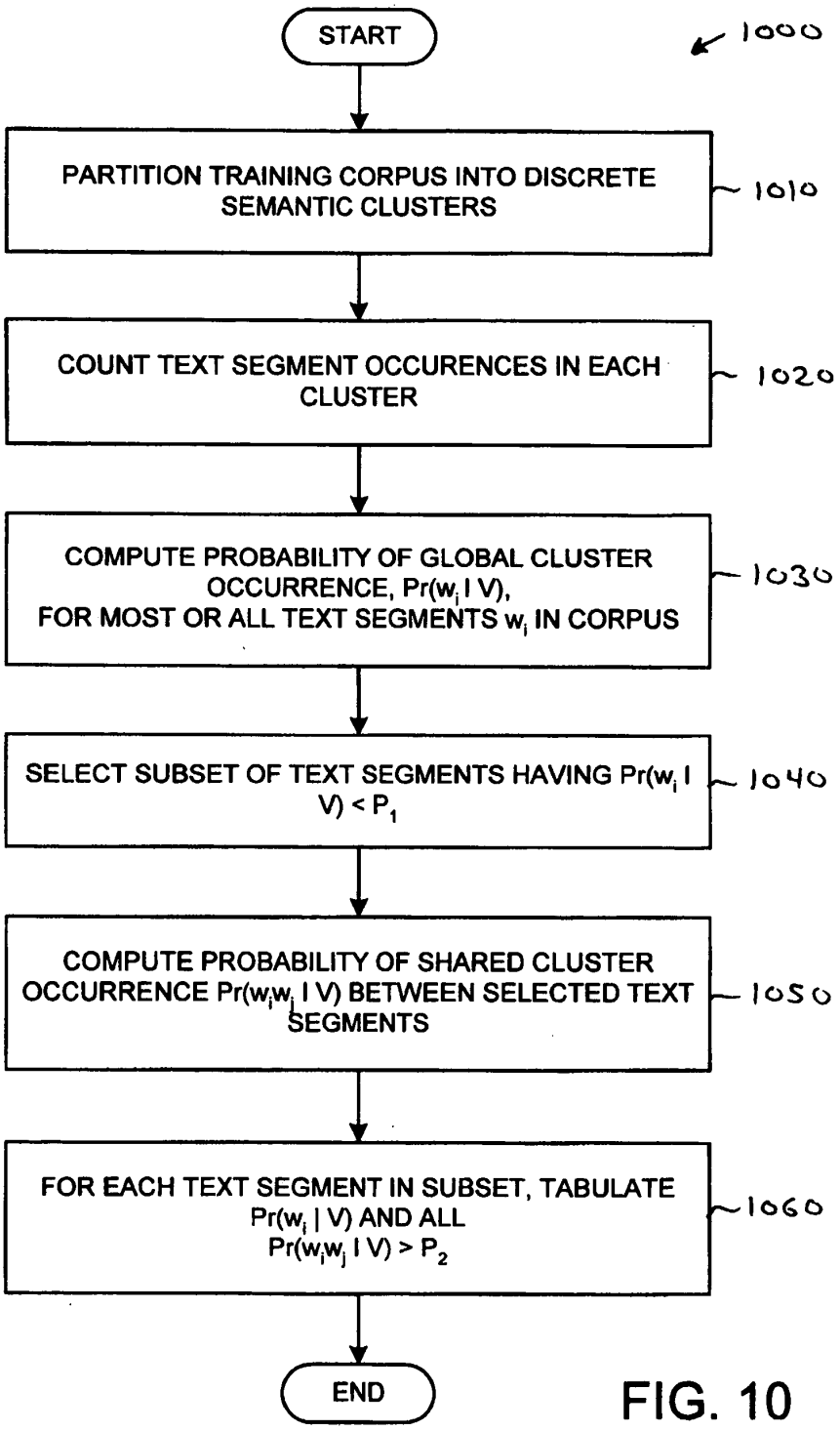

START
1000
PARTITION TRAINING CORPUS INTO DISCRETE SEMANTIC CLUSTERS
1010
COUNT TEXT SEGMENT OCCURENCES IN EACH CLUSTER
1020
COMPUTE PROBABILITY OF GLOBAL CLUSTER OCCURRENCE, Pr(w_i | V), FOR MOST OR ALL TEXT SEGMENTS w_i IN CORPUS
1030
SELECT SUBSET OF TEXT SEGMENTS HAVING Pr(w_i | V) < P_1
1040
COMPUTE PROBABILITY OF SHARED CLUSTER OCCURRENCE Pr(w_i w_j | V) BETWEEN SELECTED TEXT SEGMENTS
1050
FOR EACH TEXT SEGMENT IN SUBSET, TABULATE Pr(w_i | V) AND ALL Pr(w_i w_j | V) > P_2
1060
END

FIG. 10

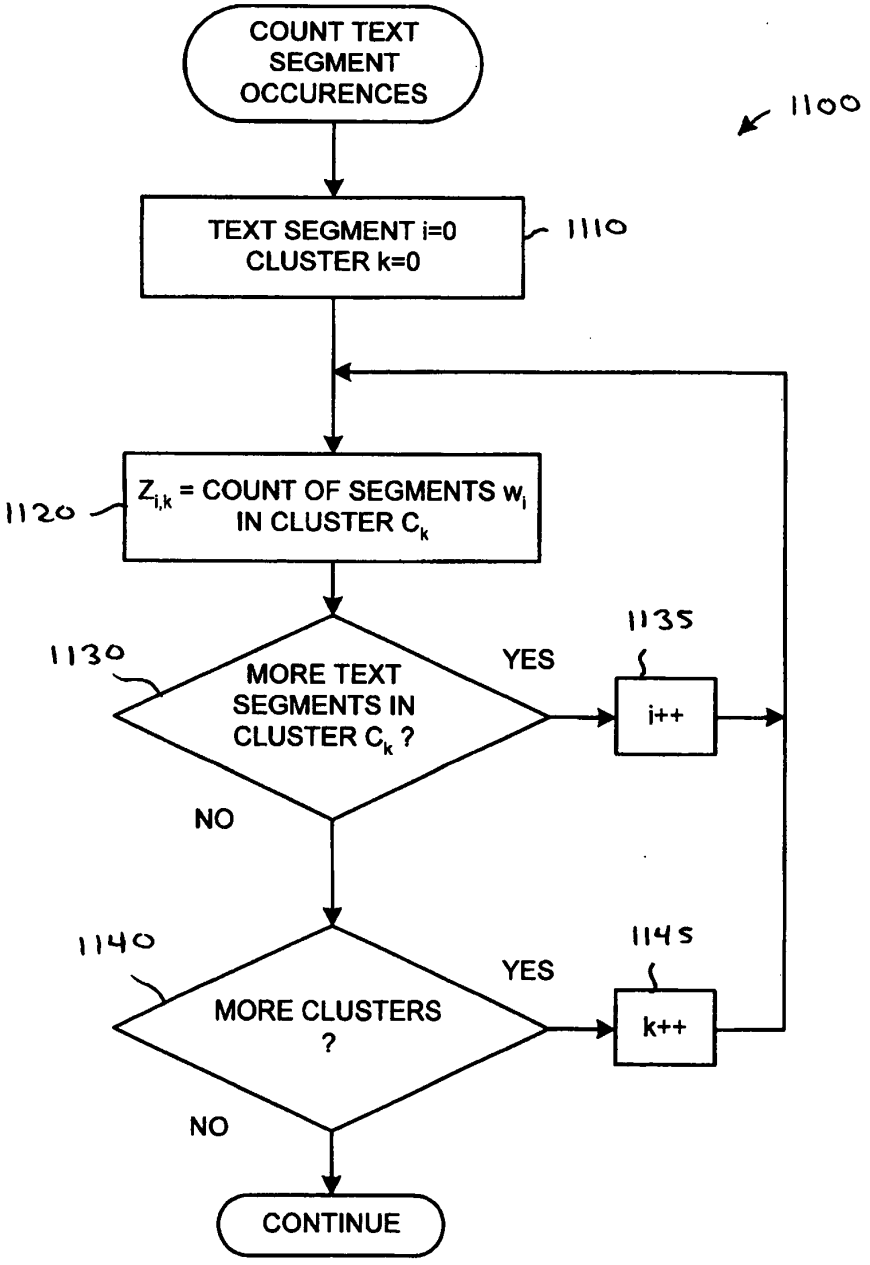

COUNT TEXT SEGMENT OCCURENCES
1100
TEXT SEGMENT i=0 CLUSTER k=0
1110
$Z_{i,k}$ = COUNT OF SEGMENTS w_i IN CLUSTER C_k
1120
MORE TEXT SEGMENTS IN CLUSTER C_k ?
1130
YES
1135
i++
NO
MORE CLUSTERS ?
1140
YES
1145
k++
NO
CONTINUE

FIG. 11

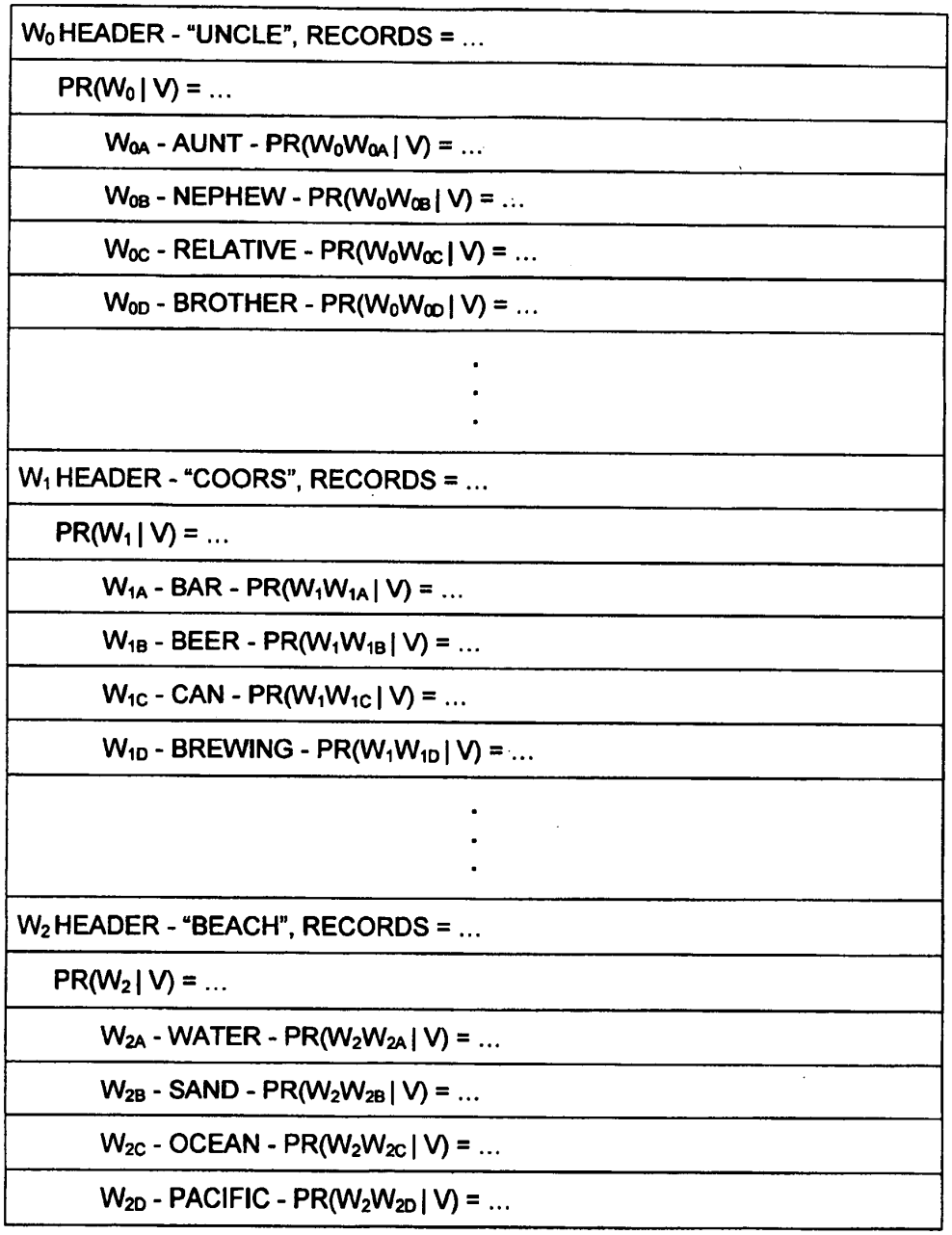

W_0 HEADER - "UNCLE", RECORDS = ...
PR(W_0 | V) = ...
W_{0A} - AUNT - PR(W_0W_{0A} | V) = ...
W_{0B} - NEPHEW - PR(W_0W_{0B} | V) = ...
W_{0C} - RELATIVE - PR(W_0W_{0C} | V) = ...
W_{0D} - BROTHER - PR(W_0W_{0D} | V) = ...
W_1 HEADER - "COORS", RECORDS = ...
PR(W_1 | V) = ...
W_{1A} - BAR - PR(W_1W_{1A} | V) = ...
W_{1B} - BEER - PR(W_1W_{1B} | V) = ...
W_{1C} - CAN - PR(W_1W_{1C} | V) = ...
W_{1D} - BREWING - PR(W_1W_{1D} | V) = ...
W_2 HEADER - "BEACH", RECORDS = ...
PR(W_2 | V) = ...
W_{2A} - WATER - PR(W_2W_{2A} | V) = ...
W_{2B} - SAND - PR(W_2W_{2B} | V) = ...
W_{2C} - OCEAN - PR(W_2W_{2C} | V) = ...
W_{2D} - PACIFIC - PR(W_2W_{2D} | V) = ...

FIG. 12

1200

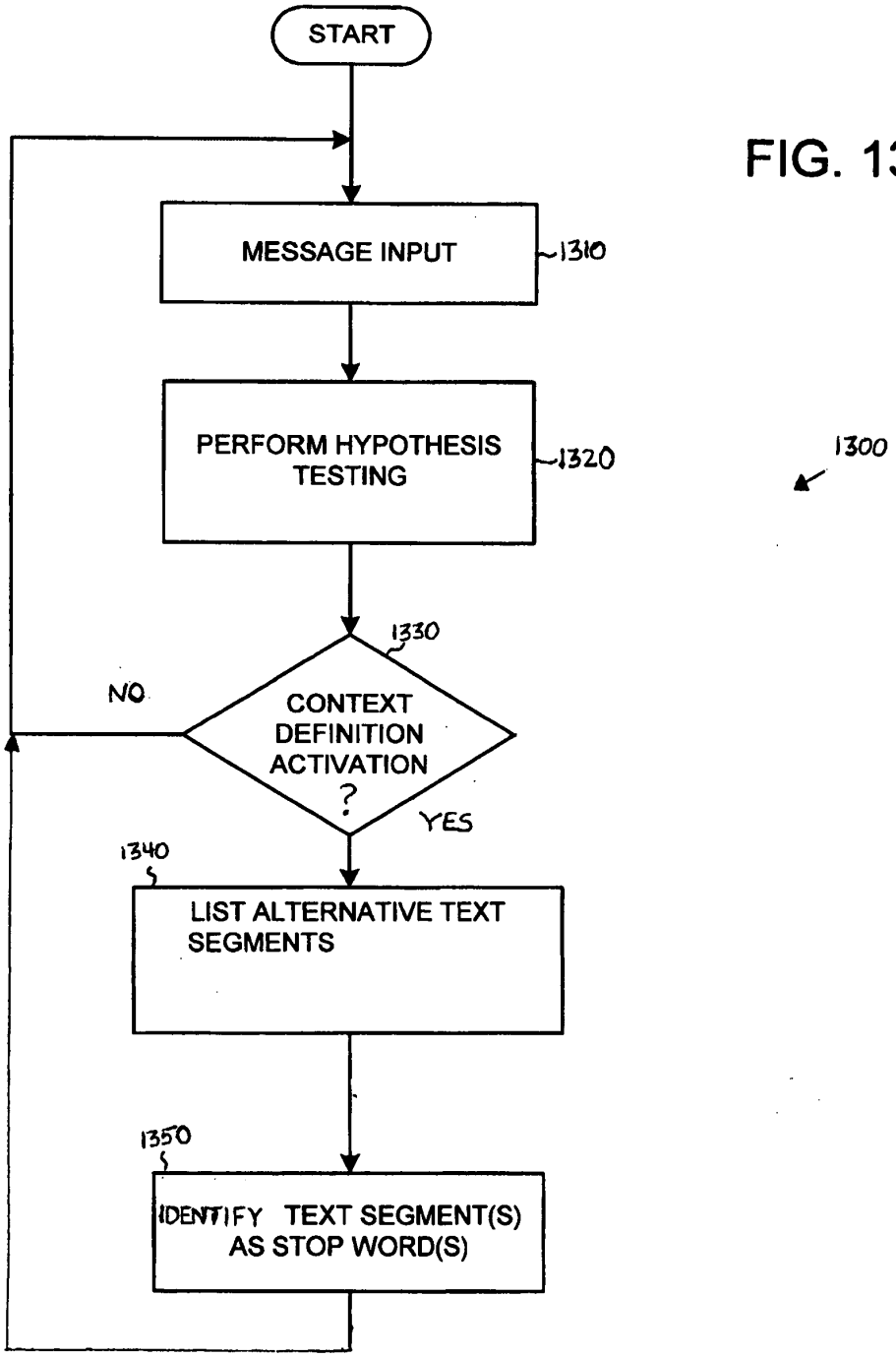

START
MESSAGE INPUT
1310
PERFORM HYPOTHESIS TESTING
1320
1300
1330
NO
CONTEXT DEFINITION ACTIVATION ?
YES
1340
LIST ALTERNATIVE TEXT SEGMENTS
1350
IDENTIFY TEXT SEGMENT(S) AS STOP WORD(S)

FIG. 13

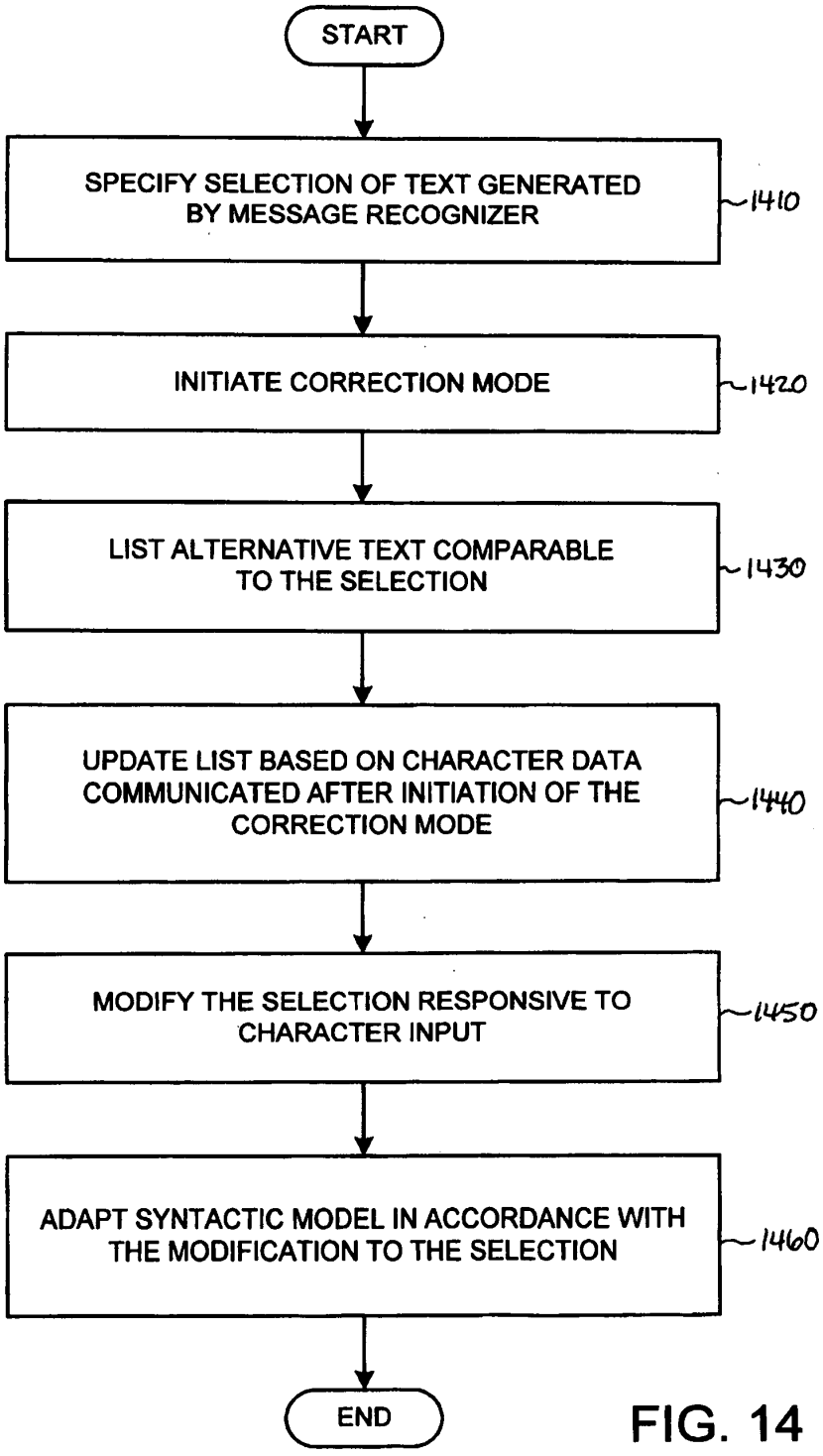

START
SPECIFY SELECTION OF TEXT GENERATED BY MESSAGE RECOGNIZER
1410
INITIATE CORRECTION MODE
1420
LIST ALTERNATIVE TEXT COMPARABLE TO THE SELECTION
1430
UPDATE LIST BASED ON CHARACTER DATA COMMUNICATED AFTER INITIATION OF THE CORRECTION MODE
1440
MODIFY THE SELECTION RESPONSIVE TO CHARACTER INPUT
1450
ADAPT SYNTACTIC MODEL IN ACCORDANCE WITH THE MODIFICATION TO THE SELECTION
1460
END

FIG. 14

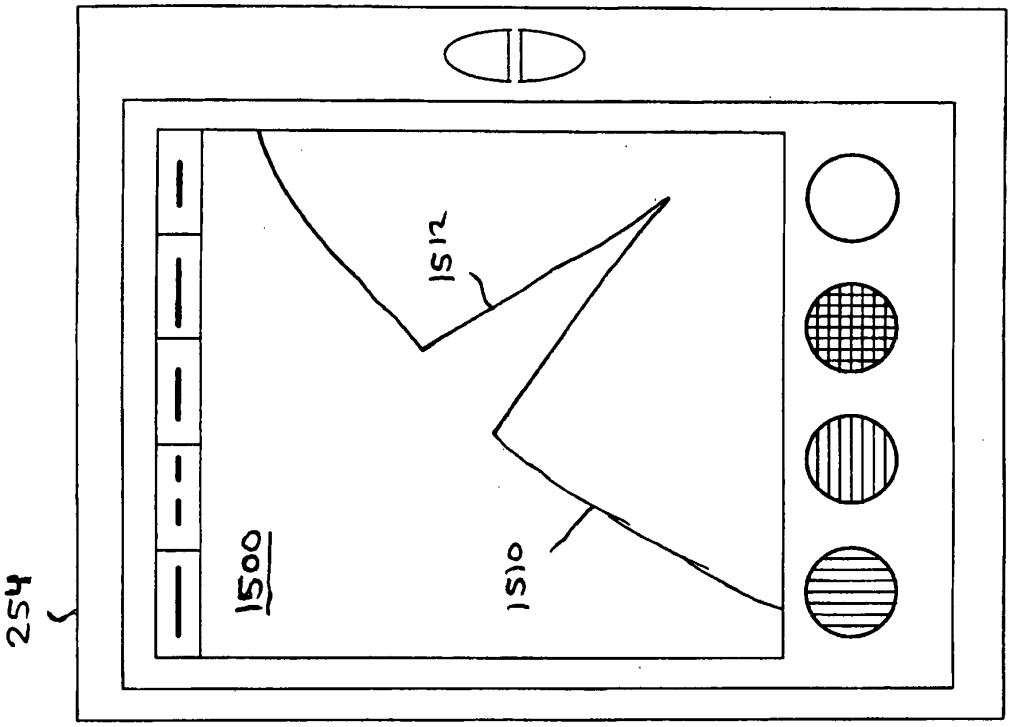


FIG. 15B

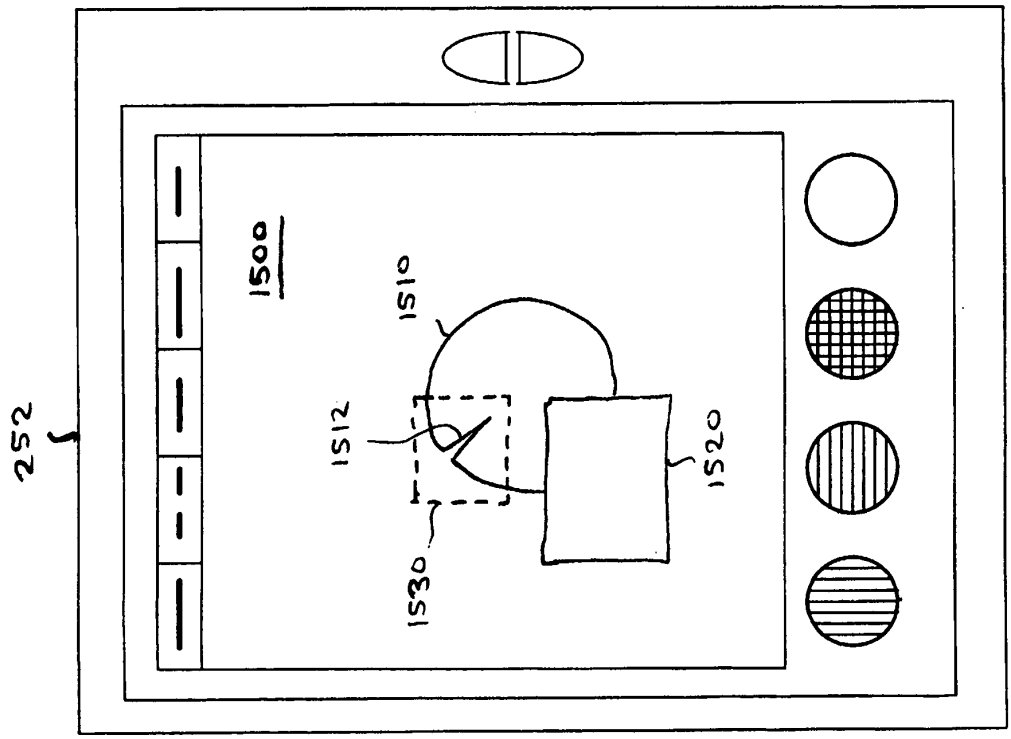


FIG. 15A

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DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)

☑ Declaration Submitted with Initial Filing OR ☐ Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required)

Attorney Docket Number	
First Named Inventor	Edwin A. Suominen
COMPLETE IF KNOWN	
Application Number	
Filing Date	01/28/2002
Art Unit	2641*
Examiner Name	Nolan, D.* **in parent app.*

As the below named inventor, I hereby declare that:

My residence, mailing address, and citizenship are as stated below next to my name.

I believe I am the original and first inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Text Processing System

No power of attorney granted in this application, which is a Continuation of U.S. Application No. 09/616,157 filed July 14, 2000.

(Title of the Invention)

the specification of which

☑ is attached hereto

OR

☐ was filed on (MM/DD/YYYY) ☐ as United States Application Number or PCT International

Application Number ☐ and was amended on (MM/DD/YYYY) ☐ (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 specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached? YES	NO
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto:

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DECLARATION — Utility or Design Patent Application

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Edwin A. Suominen
Name

14614 North Kierland Boulevard, Suite 300
Address

Scottsdale	Arizona	85254
City	**State**	**ZIP**

USA	(480) 948-3295	(480) 948-3387
Country	**Telephone**	**Fax**

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 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

NAME OF SOLE OR FIRST INVENTOR : ☐ A petition has been filed for this unsigned inventor

Given Name (first and middle [if any])	Family Name or Surname
Edwin A.	Suominen

Inventor's Signature [signature] **Date** Jan. 28, 2002

Residence: City	State	Country	Citizenship
Valley	Washington	USA	USA

3355 East Jump Off Joe Road
Mailing Address

City	State	ZIP	Country
Valley	Washington	99181	USA

NAME OF SECOND INVENTOR: ☐ A petition has been filed for this unsigned inventor

Given Name (first and middle [if any])	Family Name or Surname

Inventor's Signature **Date**

Residence: City	State	Country	Citizenship

Mailing Address

City	State	ZIP	Country

☐ Additional inventors are being named on the ____supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto.

[Page 2 of 2]

PATENT APPLICATION SERIAL NO. _____

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

03/28/2005 DTESSEM1 00000050 11088032

01 FC:2011	150.00	OP
02 FC:2111	250.00	OP
03 FC:2311	100.00	OP

PTO-1556
(5/87)

U S Government Printing Office: 2002 — 489-267/69033

PATENT APPLICATION FEE DETERMINATION RECORD
Effective December 8, 2004

11088032

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS	5	
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	5 minus 20=	*
INDEPENDENT CLAIMS	1 minus 3 =	*
MULTIPLE DEPENDENT CLAIM PRESENT		☐

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

SMALL ENTITY TYPE ☐		OR	OTHER THAN SMALL ENTITY	
RATE	FEE		RATE	FEE
BASIC FEE	150.00	OR	BASIC FEE	300.00
X$ 25=		OR	X$50=	
X100=		OR	X200=	
+180=		OR	+360=	
TOTAL	150	OR	TOTAL	

CLAIMS AS AMENDED - PART II

AMENDMENT A	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) 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$ 25=		OR	X$50=	
X100=		OR	X200=	
+180=		OR	+360=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

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

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 25=		OR	X$50=	
X100=		OR	X200=	
+180=		OR	+360=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

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

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 25=		OR	X$50=	
X100=		OR	X200=	
+180=		OR	+360=	
TOTAL ADDIT. FEE		OR	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.

FORM PTO-875 (Rev. 10/04) Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Edwin A. Suominen	Art Unit:	:	2654*
Serial No.	:	11/___,___	Examiner:	:	Armstrong, A.*
Filing Date	:	March 22, 2005	* *In parent application*		
Title	:	Message Recognition Using Shared Language Model			

Mail Stop Patent Application
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

PRELIMINARY AMENDMENT

Dear Sir:

Applicant submits the following prior to examination of this application:

- **Amendments to the Specification** beginning on page 2 of this paper.
- **Amendments to the Claims** reflected in the listing of claims beginning on page 5 of this paper.

Upon entry of this amendment, claims 81-85 are pending in the application, for a total of one independent and five overall claims. Please feel free to telephone the undersigned (who is also the applicant) if it would in any way advance prosecution of the application.

Respectfully submitted,

Dated: March 22, 2005

Edwin A. Suominen
Reg. No. 43,174

14614 North Kierland Boulevard
Suite 300
Scottsdale, Arizona 85254
(480) 948-3295

AMENDMENTS TO THE SPECIFICATION

Please amend the title as follows:

~~Text Processing System~~ Message Recognition Using Shared Language Model

Please insert the following new section heading and paragraph immediately before the section "Background of the Invention" on page 1:

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation of U.S. application Serial No. 10/061,052 filed on January 28, 2002, now U.S. Patent _____, which is a continuation of U.S. application Serial No. 09/616,157 filed on July 14, 2000, now abandoned, which claims benefit of U.S. provisional application Serial No. 60/144,481 filed on July 17, 1999.

Please amend paragraph 2 on page 27 as follows:

Wireless nodes 227 and 230 include any suitable transmitter(s) and/or receiver(s) for establishing respective communications links 225 and 235. Transmitter 122 and receiver 160, discussed above with reference to FIG. 1A, are examples of suitable transmitters and receivers, respectively. Node 227 establishes ~~bidirectional~~ bi-directional communications between domain controller 220 and each tablet 252, 254, and 256. Because communications link 225 is ~~bidirectional~~ bi-directional, node 227 includes both a transmitter and receiver. Node 230 establishes unidirectional communications between domain controller 220 and styluses 210 and 212. Typically, only a unidirectional communications link is needed to a stylus, because the stylus typically only sends information.

Please amend paragraph 3 on page 38 as follows:

The semantic model may be part of a shared language model of the invention. In message recognizer 310, for example, semantic model 354 is part of shared language model 350. A message recognizer may include two or more subordinate message

recognizers, each of which may operate in accordance with the semantic model in the shared language model. Advantageously, the accuracy of each subordinate message recognizer sharing a language model that includes a semantic model ~~model~~ according to various aspects of the present invention may be improved by user identification of context.

Please amend paragraph 3 on page 40 as follows:

A ~~nontechnical~~ non-technical word that appears in a technical document such as a patent application may be designated as a stop word outside the present context, regardless of the author's overall writing habits. For example, words relating to familial relationships (including the word UNCLE) are not typically used in patent applications. In the "horizontal" example, a user may identify the word UNCLE as being outside the present context (but not the user context) by drawing a single line through it, for example in the first alternative text listing "cores Uncle." ~~Double~~ Single lines may then appear drawn through each occurrence of the word UNCLE, since the word has been identified as a "present context" stop segment.

Please amend paragraph 3 on page 48 as follows:

A context definition mode that is initiated automatically [[a]] can present the user with a list of alternative text segments in addition to the message recognizer's "best guess." Alternatively, the user may be ~~present~~ presented with a simple question that may be quickly answered. For example, if the user dictates the sentence "Can you recognize speech?", the message recognizer may determine that the word BEACH could be especially useful for indicating context as a stop segment. If the message recognizer is configured to initiate a context definition mode automatically, the user might be presented with a dialog box containing the statement "You dictated the phrase RECOGNIZE SPEECH. Is the word BEACH of context?" and three "radio buttons" labeled "No," "Yes, this time," and "Always." If the word BEACH is not out of context, the user could select (or say) "No." If the word BEACH is outside the present context,

the user could select or say "Yes, this time. " If the word BEACH is outside the user context, the user could select or say "Always."

AMENDMENTS TO THE CLAIMS

Claims 1-80 (canceled)

Claim 81 (new) A system for generating text responsive to both voice and handwriting input, comprising:

(a) a microphone;

(b) a stylus; and

(c) a tablet including (1) a tablet surface, (2) a flat-panel display integrated into the tablet surface and responsive to freehand input conveyed via manipulation of the stylus on or near the tablet surface to render ink-like indicia of the freehand input, and (3) a message recognizer including a speech recognizer and a handwriting recognizer;

(d) wherein the speech recognizer is responsive to voice input conveyed via the microphone to provide text data in accordance with both a shared language model and an acoustic model; and

(e) the handwriting recognizer is responsive to freehand input conveyed via the stylus to provide text data in accordance with both the shared language model and a handwriting model.

Claim 82 (new) The system of claim 81 wherein the microphone is not head-mounted.

Claim 83 (new) The system of claim 82 wherein the microphone is housed in the stylus.

Claim 84 (new) The system of claim 1 wherein the shared language model is trainable responsive to user correction of misrecognition by either the speech recognizer or the handwriting recognizer, thereby improving accuracy of both.

Claim 85 (new) The system of claim 1 wherein:

(a) the speech recognizer provides text data without being responsive to freehand input supplied to the the handwriting recognizer; and

(b) the handwriting recognizer provides text data without being responsive to voice input supplied to the the speech recognizer.