Paper No. 25

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte JEROME R. BELLEGARDA and DIMITRI KANEVSKY

Appeal No. 1995-3030
Application No. 08/073,091

ON BRIEF

Before JERRY SMITH, FLEMING, and BARRY, Administrative Patent Judges.

BARRY, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the rejection of claims 44-89. We reverse.

BACKGROUND

The invention at issue in this appeal relates to message recognition. A user's speech is converted to a first signal; his handwriting is converted to a second signal. The first and second signals 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 processing includes converting the first signal into a plurality of first multidimensional vectors and converting the second signal into a plurality of second multidimensional vectors. For a system employing a combined use of speech and handwriting, the processing includes combining individual ones of the plurality of first multidimensional vectors and individual ones of the plurality of second multidimensional vectors to form a plurality of third multidimensional vectors. The multidimensional 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.

Claim 44, which is representative for our purposes, follows:

44. A message recognition system comprising:

a first transducer for converting a user's speech to a first signal;

a second transducer for converting the user's handwriting to a second signal; and

a data processor, having a first input coupled to the first signal and a second input coupled to the second signal, for processing the first signal and the second signal to identify an informational content of the first signal and the second signal, said data processor including,

a first likelihood estimator for generating a first list comprised of one or more probable messages conveyed by the informational content of the first signal;

a second likelihood estimator for generating a second list comprised of one or more probable messages conveyed by the information content of the second signal;

wherein a probable message is comprised of at least one word;

a likelihood merger for selectively merging the first list and the second list to form a third list;

a decoder for selecting from the third list a most probable one of the probable messages to be an output message; and

means for outputting the output message.

The references relied on in rejecting the claims follow:

Maeda et al. (Maeda) 4,651,289 Mar. 17, 1987

Korsinsky 4,736,447 Apr. 5, 1988

Bokser 4,754,489 June 28, 1988

Clark 4,805,225 Feb. 14, 1989

Everett, Jr. et al. (Everett) 4,857,912 Aug. 15, 1989

Piosenka et al. (Piosenka) 4,993,068 Feb. 12, 1991

Petajan, Automatic Lipreading to Enhance Speech Recognition, IEEE Publication, pp. 40-47 (1985).

Claims 44, 56, 63, 74, 85, 87, and 89 stand rejected under 35 U.S.C. § 102(b) as anticipated by Korsinsky. Claims 44, 55, 56, 62, 63, 74, 84, 85, 87, and 89 stand rejected under 35 U.S.C. § 102(e) as anticipated by Piosenka. Claims 45, 64, and 75 stand rejected under 35 U.S.C. § 103 as obvious over Piosenka in view of Everett. Claims 46, 65, and 76 stand rejected under § 103 as obvious over Piosenka in view of Petajan. Claims 47, 48, 51, 52, 57, 58, 66, 67, 70, 77-79, 86, and 88 stand rejected under § 103 as obvious Piosenka in view of Maeda. Claims 49, 53, 54, 59, 61, 68, 71-73, 80, 81, and 83 stand rejected under § 103 as obvious over Piosenka in view of Maeda further in view of Bokser. Claims 50, 60, 69, and 82 stand rejected under § 103 as obvious over Piosenka in

view of Maeda further in view of Clark. Rather than repeat the arguments of the appellants or examiner in toto, we refer the reader to the briefs and answer for the respective details thereof.

OPINION

In deciding this appeal, we considered the subject matter on appeal and the rejection advanced by the examiner. Furthermore, we duly considered the arguments and evidence of the appellants and examiner. After considering the record, we are persuaded that the examiner erred in rejecting claims 44-89. Accordingly, we reverse.

We begin by noting the following principles from Rowe v. Dror, 112 F.3d 473, 478, 42 USPQ2d 1550, 1553 (Fed. Cir. 1997).

> A prior art reference anticipates a claim only if the reference discloses, either expressly or inherently, every limitation of the claim. See Verdegaal Bros., Inc. v. Union Oil Co., 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "[A]bsence from the reference of any claimed element negates anticipation." Kloster Speedsteel AB v. Crucible, Inc., 793 F.2d 1565, 1571, 230 USPQ 81, 84 (Fed. Cir. 1986).

We also note the following principles from In re Rijckaert, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993).

> In rejecting claims under 35 U.S.C. Section 103, the examiner bears the initial burden of presenting a prima facie case of obviousness. In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).... "A prima facie case of obviousness is established when the teachings from the prior art itself would appear to have suggested the claimed subject matter to a person of ordinary skill in the art." In re Bell, 991 F.2d 781, 782, 26 USPQ2d 1529, 1531 (Fed. Cir. 1993) (quoting In re Rinehart, 531 F.2d 1048, 1051, 189 USPQ 143, 147 (CCPA 1976)).

With these principles in mind, we consider the rejections relying on Korsinsky and the rejections relying on Piosenka.

I. Rejections Relying on Korsinsky

The examiner alleges, "the computer in conjunction with handwriting division unit and dictation division unit (elements 10 and 12 in figure 1) merges the respective results of the units." (Examiner's Answer at 12.) The appellants argue, "[i]n contradistinction to the system of Korsinsky ... each of the independent claims of the instant patent

application claims a merging or combining of estimated likelihoods derived from speech and handwriting inputs, or claims a combination of input signals from speech and handwriting transducers, to select a most probable message that is input to the system." (Appeal Br. at 19.)

Claims 44-55 specify in pertinent part the following limitations:

> a first transducer for converting a user's speech to a first signal;
>
> a second transducer for converting the user's handwriting to a second signal; and
>
> ...
>
> a first likelihood estimator for generating a first list comprised of one or more probable messages conveyed by the informational content of the first signal;
>
> a second likelihood estimator for generating a second list comprised of one or more probable messages conveyed by the information content of the second signal;
>
> ...
>
> a likelihood merger for selectively merging the first list and the second list to form a third list ....

Similarly, claims 56-62 specify in pertinent part the

following limitations:

> a first transducer for converting a user's speech to a first signal;
>
> a second transducer operating in parallel with said first transducer for converting the user's handwriting to a second signal;
>
> a signal combiner, having a first input coupled to the first signal and a second input coupled to the second signal, for combining the first signal and the second signal to generate a third signal ....

Similarly, claims 63-73 specify in pertinent part the

following limitations:

> operating a first transducer for converting a user's speech to a first signal;
>
> operating a second transducer for converting the user's handwriting to a second signal; and
>
> ...
>
> operating at least one likelihood estimator for generating one or more probable messages conveyed by the informational content of both the first signal and the second signal ....

Also similarly, claims 74-84 specify in pertinent part the

following limitations:

> operating a first transducer for converting a user's speech to a first signal;

> operating a second transducer for converting, in parallel with the step of converting a user's speech, the user's handwriting to a second signal;
>
> combining with a digital data processor the first signal and the second signal to generate a third signal ....

Further similarly, claims 85 and 86 specify in pertinent part the following limitations:

> a user interface having a first input coupled to an output of a speech transducer means and a second input coupled to an output of a handwriting transducer means, for receiving signals therefrom and for converting the signals to a first multi-dimensional representation of a speech signal and to a second multi-dimensional representation of a handwriting signal;
>
> a first likelihood estimator, having an input coupled to said first multi-dimensional representation of the speech signal, for generating, in accordance with an associated first word model and in response to the first multi-dimensional representation, a first list comprised of one or more probable words that the first multi-dimensional representation may represent;
>
> a second likelihood estimator, having an input coupled to said second multi-dimensional representation of the handwriting signal, for generating, in accordance with an associated second word model and in response to the second multi-dimensional representation, a second list comprised of one or more probable words that the second multi-dimensional representation may represent;

> a likelihood merger, having an input coupled to an output of said first generating means and to an output of said second generating means, for selectively merging said first list and said second list into a third list comprised of probable words ....

Similarly, claims 87 and 88 specify in pertinent part the following limitations:

> a user interface having a first input coupled to an output of a speech transducer means and a second input coupled to an output of a handwriting transducer means, for simultaneously receiving a speech signal from the speech transducer and a handwriting signal from the handwriting transducer and for converting the speech signal to a first multi-dimensional representation and for converting the handwriting signal to a second multi-dimensional representation;
>
> a combiner for combining the first and the second multi-dimensional representations into a third multidimensional representation that is a combination of both the speech signal and the handwriting signal ....

Similarly, claim 89 specifies in pertinent part the following limitations:

> a first user interface having an input coupled to an output of a speech transducer means, for converting an output thereof to a multi-dimensional representation of a speech signal;
>
> a second user interface having an input coupled to an output of a handwriting transducer means, for converting an output thereof to a multi-dimensional representation of a handwriting signal;

> a first likelihood estimator that is responsive to said multi-dimensional representation of the speech signal, for generating, in accordance with an associated first word model, a first list comprised of one or more probable words that the multi-dimensional representation of the speech signal may represent, said first likelihood estimator having an input coupled to an output of a first language model, said first likelihood estimator being responsive to said first language model for eliminating probable words from said first list that are incompatible with said first language model;
>
> a second likelihood estimator that is responsive to said multi-dimensional representation of the handwriting signal, for generating, in accordance with an associated second word model, a second list comprised of one or more probable words that the multi-dimensional representation of the handwriting signal may represent, said second likelihood estimator having an input coupled to an output of a second language model, said second likelihood estimator being responsive to said second language model for eliminating probable words from said second list that are incompatible with said second language model;
>
> a likelihood combiner having an input coupled to an output of said first likelihood estimator and to an output of said second likelihood estimator for selectively merging said first list and said second list into a third list comprised of probable words, said likelihood estimator being responsive to a set of predetermined weights ....

Accordingly, the limitations of claims 44-89 require combining signals from a speech transducer and a handwriting transducer

to select a most probable message input to a message recognition system.

The examiner fails to show a teaching of the claimed limitations in Korsinsky. Although the reference teaches signals from a dictation division and a handwriting division in a message recognition system, the signals are not combined to select a most probable message that is input to the system. To the contrary, the divisions perform their respective operations "independently." Col. 5, ll. 57-60. More specifically, "[e]ach word is recognized from handwriting or dictation compared against the contents of an unabridged dictionary for accurate recognition." Col. 2, ll. 32-34 (emphasis added). The results of each recognition, moreover, are stored in separate, individual files. Col. 5, ll. 29-36.

Because Korsinsky teaches performing handwriting recognition and dictation recognition independently of each other, we are not persuaded that the reference discloses the aforementioned limitations. Therefore, we reverse the

rejection of claims 44, 56, 63, 74, 85, 87, and 89 as anticipated by Korsinsky. Next, we address the rejections relying on Piosenka

II. Rejections Relying on Piosenka

The examiner makes the following allegation.

> Piosenka et al. provides a first transducer for converting a user's speech to a first signal (figure 1 : 14); a second transducer for converting the user's handwriting to a second signal (figure 1 : 15); a digital data processor, having a first input coupled to the first signal and a second input coupled to the second signal, for processing the first signal and the second signal to identify an informational content of the first and second signal (figure 1 : 1); the digital data processor including, a first likelihood estimator for generating a first list comprised of one or more probable messages conveyed by the informational content of the first signal (figure 2 : 37); a second likelihood estimator for generating a second list comprised of one or more probable messages conveyed by the informational content of the second signal (figure 2 : 42); wherein a probable message is comprised of at least one word (refer to column 5, lines 39-51); a likelihood merger for selectively merging the first list and the second list to form a third list (figure 2 : 37); a decoder for selecting from the third list a most probable one of the probable messages to be an output message (figure 2 : 39); and means for outputting the output mesage [sic] (figure 2 : 39).

(Examiner's Answer at 5-6.) The appellants argue, "Piosenka recognizes a person, as opposed to recognizing a message conveyed by a person." (Appeal Br. at 23.)

As mentioned regarding the rejections relying on Korsinsky, the limitations of claims 44-89 require combining signals from a speech transducer and a handwriting transducer to select a most probable message input to a message recognition system. The examiner fails to show a teaching or suggestion of the claimed limitations in the prior art. Although Piosenka teaches that "user **2** may have a voice print taken by voice print processor **14**," col. 5, ll. 3-4, and "static and dynamic signature information received form [sic] pressure tablet **15**," col. 5, ll. 26-27, signals from the voice print processor and the pressure tablet are not combined to select a most probable message input to a message recognition system. To the contrary, data obtained from the processor and tablet are compared with decrypted credentials to determine the identity of a user. Specifically, "[t]rait processor and comparison logic **37** then compares the set of data obtained

from decryption function **42** which was read from the credentials card **3** with the information obtained from one or more of the physical trait input devices **31** through **34**." Col. 8, ll. 50-55. "The result of this comparison is the decision whether the user **2** is physically the same individual as that described on the media card **3**." Id. at ll. 58-61.

The examiner fails to allege, let alone show, that Everett, Petajan, Maeda, Bokser, or Clark cures the deficiency of Piosenka. Because Piosenka performs personal identification rather than message recognition, we are not persuaded that teachings from the prior art anticipate or would have suggested the aforementioned limitations. Therefore, we reverse the rejection of claims 44, 55, 56, 62, 63, 74, 84, 85, 87, and 89 as anticipated by Piosenka; the rejection of claims 45, 64, and 75 as obvious over Piosenka in view of Everett; the rejection of claims 46, 65, and 76 as obvious over Piosenka in view of Petajan; the rejection of claims 47, 48, 51, 52, 57, 58, 66, 67, 70, 77-79, 86, and 88

as obvious Piosenka in view of Maeda; the rejection of claims 49, 53, 54, 59, 61, 68, 71-73, 80, 81, and 83 as obvious over Piosenka in view of Maeda further in view of Bokser; and the rejection of claims 50, 60, 69, and 82 as obvious over Piosenka in view of Maeda further in view of Clark.

CONCLUSION

In summary, the rejections of claims 44-89 under 35 U.S.C.

§ 102(b), 35 U.S.C. § 102(e), and 35 U.S.C. § 103 are reversed.

REVERSED

JERRY SMITH Administrative Patent Judge	)	
MICHAEL R. FLEMING Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
LANCE LEONARD BARRY Administrative Patent Judge	)	

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