

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 18

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TSUHAN CHEN

Appeal No. 1998-0875
Application No. 08/210,529

ON BRIEF

Before HAIRSTON, HECKER, and DIXON, Administrative Patent Judges.

HAIRSTON, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1, 3 through 11, 13 through 16, 19 and 24 through 26.

The disclosed invention relates to a method and apparatus for increasing the frame rate of a video signal representative of a sequence of images received from a speaking person. An image feature extraction module that analyzes mouth movements, and a speech recognition module that analyzes speech segments

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are used

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in the method and apparatus to create synthesized frames representative of an image of the person speaking to thereby increase the frame rate of the video signal.

Claim 1 is illustrative of the claimed invention, and it reads as follows:

1. An apparatus for increasing the frame rate of a received video signal representative of a sequence of images of a speaking person and having a first frame rate, comprising:

a monitoring system for monitoring an audio signal temporally corresponding to the sequence of images to detect speech segments uttered by the speaking person, at least some detected speech segments corresponding to images of the image sequence that are not represented by the received video signal;

an associating system for associating detected speech segments with stored parametric mouth formation data; and

a frame generating system, responsive to said monitoring system and said associating system, for generating at least one synthesized frame representative of an image of the speaking person and for inserting said at least one synthesized frame between adjacent frames of the received video signal to thereby provide a video signal having a frame rate higher than said first frame rate.

The references relied on by the examiner are:

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Ejiri ¹	62-274962	Nov. 28,
1987		
(Published Japanese Kokai Patent Application)		
Welsh	WO 94/00951	Jan. 6, 1994
(Published PCT International Patent Application)		

Claims 1, 3 through 11, 13 through 16, 19 and 24 through 26 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Welsh and Ejiri.

Reference is made to the brief (paper number 13) and the answer (paper number 14) for the respective positions of the appellant and the examiner.

OPINION

The obviousness rejection of claims 1, 3 through 11, 13 through 16, 19 and 24 through 26 is reversed.

Welsh recognizes that a 10 frame/second transmission rate of an image transmitter (Figure 1) leads to a loss of synchronization between a speaker's lips and the transmitted speech (page 2). By extracting and encoding lip movement via feature extractor 106 and encoder 110, respectively, at a higher frame/second rate than the remainder of the image encoded by encoder 102, the speaker's lips can be placed in

¹A copy of the translation for this reference is attached.

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synchronization with the speaker's speech received at the receiver (pages 12 and 13; Figure 7).

In Ejiri, terminal 2 (Figure 3) contains a voice recognizer unit 4 that recognizes a voice received over line 1 (translation, page 6). The voice data output from voice recognizer unit 4 is sent to control unit 6 where a query is made to image storage device 12 for a previously stored image of a person that matches the recognized voice. If a match is found, then a synthesized image of the person in image storage device 12 that matches the recognized voice is combined with the received voice by control unit 6 to give the viewers of the display 11 the illusion that they actually see the person talking to them (translation, pages 6, 7, 9 and 10).

Appellant argues (Brief, page 11) that "Welsh deals with coding video signals corresponding to images at the transmitting side, at two different rates." According to the appellant (brief, page 11), "[t]he slow moving portion of each image is coded at one frame rate and the faster moving portions of each image is [sic, are] coded at a faster frame rate." Appellant concludes (brief, page 12) that "[t]here is

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no suggestion or teaching in Welsh to determine the position of the fast moving portions of the image at the receiving side based on the received video frame, so as to synthesize frames based on the speech information." With respect to Ejiri, appellant argues (brief, page 9) that:

The arrangement of Ejiri is completely different from the present invention as claimed. For example, there is no teaching or suggestion in Ejiri to synthesize video frames and insert them between adjacent received video frames. Ejiri's purpose was to avoid transmission of video images during a telephone conversation. The translated Ejiri specification (of record) at p. 3 indicates that the transmission of "timed images" using "conventional television telephones" are not satisfactory for general purpose systems because of the "increased volume of signals that have (sic) to be transmitted per hour." Ejiri thus conceives of his inventive concept as an alternative to teleconferencing systems of the types that employ transmission of video images, such as the one proposed by the applicant

Furthermore, Ejiri does not suggest or teach an apparatus or a method that employs an associating system for retrieving facial feature information from a received video frame and using that information to synthesize an image frame

We agree with appellant's arguments. Thus, "[w]ith respect to the pending claims in the present application, the references cited by the Examiner fail to provide any teaching

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or suggestion for providing an apparatus and method configured to insert synthesized frames in between received video frames, based on received speech signals" (brief, page 8). As a result thereof, the obviousness rejection of claims 1, 3 through 11, 13 through 16, 19 and 24 through 26 is reversed.

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DECISION

The decision of the examiner rejecting claims 1, 3 through 11, 13 through 16, 19 and 24 through 26 under 35 U.S.C. § 103(a) is reversed.

REVERSED

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KENNETH W. HAIRSTON))
Administrative Patent Judge)	
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)	BOARD OF PATENT
STUART N. HECKER)	
Administrative Patent Judge)	APPEALS AND
)	
)	INTERFERENCES
)	
JOSEPH L. DIXON)	
Administrative Patent Judge)	

KWH:hh

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SOFER & HAROUN, L.L.P.
342 Madison Ave., Suite 1921
New York, NY 10173-1907