

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE

CLASSIFICATION ORDER 1861

MAY 1, 2007

PROJECT Y-7071

The following classification changes will be effected by this order:

	<u>Class</u>	<u>Subclass</u>	<u>Art Unit</u>	<u>Ex'r Search Room</u>
Abolished:	None			
Established:	704	E-Subclasses: E11.001-E11.007, E13.001-E13.009, E13.01, E13.011-E13.014, E15.001- E15.009, E15.01, E15.011-E15.019, E15.02, E15.021-E15.029, E15.03, E15.031-E15.039, E15.04, E15.041- E15.049, E15.05, E17.001-E17.009, E17.01, E17.011-E17.016, E19.001- E19.009, E19.01, E19.011-E19.019, E19.02, E19.021-E19.029, E19.03, E19.031-E19.039, E19.04, E19.041- E19.049, E21.001-E21.009, E21.01, E21.011-E21.019, E21.02	2626	Not Applicable

No other classes were impacted by this order.

This order includes the following:

- A. CLASSIFICATION MANUAL CHANGES
- D. DEFINITION CHANGES AND NEW OR ADDITIONAL DEFINITIONS

CLASSIFICATION ORDER 1861

MAY 1, 2007

PROJECT Y-7071

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Editor: David Delzingaro

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1	LINGUISTICS	236	..Specialized equations or comparisons
2	.Translation machine	237	...Correlation
3	..Having particular Input/Output device	238	...Distance
4	..Based on phrase, clause, or idiom	239	...Similarity
5	..For partial translation	240	...Probability
6	..Punctuation	241	...Dynamic time warping
7	..Storage or retrieval of data	242	...Viterbi trellis
8	.Multilingual or national language support	243	..Creating patterns for matching
9	.Natural language	244	...Update patterns
10	.Dictionary building, modification, or prioritization	245	...Clustering
200	SPEECH SIGNAL PROCESSING	246	..Voice recognition
200.1	.Psychoacoustic	247	...Preliminary matching
201	.For storage or transmission	248	...Endpoint detection
202	..Neural network	249	...Subportions
203	..Transformation	250	...Specialized models
204	...Orthogonal functions	251	..Word recognition
205	..Frequency	252	...Preliminary matching
206	...Specialized information	253	...Endpoint detection
207	....Pitch	254	...Subportions
208	.....Voiced or unvoiced	255	...Specialized models
209	....Formant	256	....Markov
210	....Silence decision	256.1	.....Hidden Markov Model (HMM) (EPO)
211	..Time	256.2	.....Training of HMM (EPO)
212	...Pulse code modulation (PCM)	256.3	.....With insufficient amount of training data, e.g., state sharing, tying, deleted interpolation (EPO)
213	...Zero crossing	256.4	.....Duration modeling in HMM, e.g., semi HMM, segmental models, transition probabilities (EPO)
214	...Voiced or unvoiced	256.5	.....Hidden Markov (HM) network (EPO)
215	...Silence decision	256.6	.....State emission probability (EPO)
216	...Correlation function	256.7	.....Continuous density, e.g., Gaussian distribution, Lapalce (EPO)
217	....Autocorrelation	256.8	.....Discrete density, e.g., Vector Quantization preprocessor, look up tables (EPO)
218	....Cross-correlation	257	....Natural language
219	..Linear prediction	258	.Synthesis
220	..Analysis by synthesis	259	..Neural network
221	..Pattern matching vocoders	260	..Image to speech
222	...Vector quantization	261	..Vocal tract model
223	...Excitation patterns	262	..Linear prediction
224	..Normalizing	263	..Correlation
225	..Gain control	264	..Excitation
226	..Noise	265	..Interpolation
227	...Pretransmission		
228	...Post-transmission		
229	..Adaptive bit allocation		
230	..Quantization		
231	.Recognition		
232	..Neural network		
233	..Detect speech in noise		
234	..Normalizing		
235	..Speech to image		

Title Change
* Newly Established Subclass

@ Indent Change
& Position Change

SPEECH SIGNAL PROCESSING

.Synthesis
 266 ..Specialized model
 267 ..Time element
 268 ..Frequency element
 269 ..Transformation
 270 ..Application
 270.1 ..Speech assisted network
 271 ..Handicap aid
 272 ..Novelty item
 273 ..Security system
 274 ..Warning/alarm system
 275 ..Speech controlled system
 276 ..Pattern display
 277 ..Translation
 278 ..Sound editing
 500 **AUDIO SIGNAL BANDWIDTH
 COMPRESSION OR EXPANSION**
 501 ..With content reduction encoding
 502 ..Delay line
 503 **AUDIO SIGNAL TIME COMPRESSION OR
 EXPANSION (E.G., RUN LENGTH
 CODING)**
 504 ..With content reduction encoding

E-SUBCLASSES

The following subclasses beginning with the letter E are E-subclasses. Each E-subclass corresponds in scope to a classification in a foreign classification system, for example, the European Classification system (ECLA). The foreign classification equivalent to an E-subclass is identified in the subclass definition. In addition to US documents classified in E-subclasses by US examiners, documents are regularly classified in E-subclasses according to the classification practices of any foreign Offices identified in parentheses at the end of the title. For example, "(EPO)" at the end of a title indicates both European and US patent documents, as classified by the EPO, are regularly added to the subclass. E-subclasses may contain subject matter outside the scope of this class. Consult their definitions, or the documents themselves, to clarify or interpret titles.

* E17.001 **SPEAKER IDENTIFICATION OR
 VERIFICATION (EPO)**
 * E17.002..Recognition of special voice characteristics, e.g., for use in a lie detector; recognition of animal voices, etc. (EPO)
 * E17.003..Systems using speaker recognizers (EPO)
 * E17.004..Details (EPO)
 * E17.005..Preprocessing operations, e.g., segment selection, etc., pattern representation or modeling, e.g., based on linear discriminant analysis (LDA), principal components, etc.; feature selection or extraction (EPO)
 * E17.006..Training, model building, enrollment (EPO)
 * E17.007..Decision making techniques, pattern matching strategies (EPO)
 * E17.008...Use of particular distance or distortion metric between probe pattern and reference templates (EPO)
 * E17.009...Multimodal systems, i.e., based on the integration of multiple recognition engines or experts fusion (EPO)
 * E17.01...Score normalization (EPO)
 * E17.011...Use of phonemic categorization or speech recognition prior to speaker recognition or verification (EPO)
 * E17.012..Hidden Markov Models (HMMs) (EPO)
 * E17.013..Artificial neural networks, connectionist approaches (EPO)
 * E17.014..Pattern transformations and operations aimed at increasing system robustness, e.g., against channel noise, different working conditions, etc. (EPO)
 * E17.015..Interactive procedures, man-machine interface (EPO)
 * E17.016...User prompted to utter a password or predefined text (EPO)

Title Change
 * Newly Established Subclass

@ Indent Change
 & Position Change

- * E15.001 **SPEECH RECOGNITION (EPO)**
- * E15.002. Assessment or evaluation of speech recognition systems (EPO)
- * E15.003. Language recognition (EPO)
- * E15.004. Feature extraction for speech recognition; selection of recognition unit (EPO)
- * E15.005. Segmentation or word limit detection (EPO)
- * E15.006. Word boundary detection (EPO)
- * E15.007. Creation of reference templates; training of speech recognition systems, e.g., adaptation to the characteristics of the speaker's voice, etc. (EPO)
- * E15.008. Training (EPO)
- * E15.009. Adaptation (EPO)
- * E15.01. In the frequency domain (EPO)
- * E15.011. To speaker (EPO)
- * E15.012. Supervised, i.e., under machine guidance (EPO)
- * E15.013. Unsupervised (EPO)
- * E15.014. Speech classification or search (EPO)
- * E15.015. Using distance or distortion measures between unknown speech and reference templates (EPO)
- * E15.016. Using dynamic programming techniques, e.g., Dynamic Time Warping (DTW), etc. (EPO)
- * E15.017. Using artificial neural networks (EPO)
- * E15.018. Using natural language modeling (EPO)
- * E15.019. Using context dependencies, e.g., language models, etc. (EPO)
- * E15.02. Phonemic context, e.g., pronunciation rules, phonotactical constraints, phoneme n-grams, etc. (EPO)
- * E15.021. Grammatical context, e.g., disambiguation of the recognition hypotheses based on word sequence rules, etc. (EPO)
- * E15.022. Formal grammars, e.g., finite state automata, context free grammars, word networks, etc. (EPO)
- * E15.023. Probabilistic grammars, e.g., word n-grams, etc. (EPO)
- * E15.024. Semantic context, e.g., disambiguation of the recognition hypotheses based on word meaning, etc. (EPO)
- * E15.025. Using prosody or stress (EPO)
- * E15.026. Parsing for meaning understanding (EPO)
- * E15.027. Using statistical models, e.g., Hidden Markov Models (HMMs), etc. (EPO)
- * E15.028. Hidden Markov Models (HMMs) (EPO)
- * E15.029. Training of Hidden Markov Models (HMMs) (EPO)
- * E15.03. With insufficient amount of training data, e.g., state sharing, tying, deleted interpolation, etc. (EPO)
- * E15.031. Duration modeling in Hidden Markov Models (HMMs), e.g., semi-HMM, segmental models, transition probabilities, etc. (EPO)
- * E15.032. Hidden Markov Models (HMMs) network (EPO)
- * E15.033. State emission probabilities (EPO)
- * E15.034. Continuous densities, e.g., Gaussian distribution, Laplace, etc. (EPO)
- * E15.035. Discrete densities, e.g., Vector Quantization preprocessor, look-up tables, etc. (EPO)
- * E15.036. Neural Network (NN) as output probability estimator, e.g., hybrid HMM/NN, etc. (EPO)
- * E15.037. Non-hidden Markov Model (EPO)
- * E15.038. Recognition networks (EPO)
- * E15.039. Speech recognition techniques for robustness in adverse environments, e.g., in noise, of stress induced speech, etc. (EPO)
- * E15.04. Procedures used during a speech recognition process, e.g., man-machine dialogue, etc. (EPO)
- * E15.041. Speech recognition using nonacoustical features, e.g., position of the lips, etc. (EPO)
- * E15.042. Using position of the lips, movement of the lips, or face analysis (EPO)

Title Change
* Newly Established Subclass

@ Indent Change
& Position Change

- SPEECH RECOGNITION (EPO)**
- * E15.043.Speech to text systems (EPO)
 - * E15.044..Speech recognition depending on application context, e.g., in a computer, etc. (EPO)
 - * E15.045..Systems using speech recognizers (EPO)
 - * E15.046.Constructional details of speech recognition systems (EPO)
 - * E15.047..Distributed recognition, e.g., in client-server systems for mobile phones or network applications, etc. (EPO)
 - * E15.048..Memory allocation or algorithm optimization to reduce hardware requirements (EPO)
 - * E15.049..Multiple recognizers used in sequence or in parallel; corresponding voting or score combination systems (EPO)
 - * E15.05..Recognizers for parallel processing (EPO)
 - * E19.001**SPEECH OR AUDIO SIGNAL ANALYSIS-
SYNTHESIS TECHNIQUES FOR
REDUNDANCY REDUCTION, E.G., IN
VOCODERS, ETC.; CODING OR
DECODING OF SPEECH OR AUDIO
SIGNALS; COMPRESSION OR
EXPANSION OF SPEECH OR AUDIO
SIGNALS, E.G., SOURCE-FILTER
MODELS, PSYCHOACOUSTIC
ANALYSIS, ETC. (EPO)**
 - * E19.002.Perceptual measures for quality assessment (EPO)
 - * E19.003.Correction of errors induced by the transmission channel, if related to the coding (EPO)
 - * E19.004.Lossless audio signal coding; perfect reconstruction of coded audio signal by transmission of coding error (EPO)
 - * E19.005.Multichannel audio signal coding and decoding, i.e., using interchannel correlation to reduce redundancies, e.g., joint-stereo, intensity-coding, matrixing, etc. (EPO)
 - * E19.006.Comfort noise, silence coding (EPO)
 - * E19.007.Speech coding using phonetic or linguistical decoding of the source; reconstruction using text-to-speech synthesis (EPO)
 - * E19.008.Systems using vocoders (EPO)
 - * E19.009.Audio watermarking, i.e., embedding inaudible data in the audio signal (EPO)
 - * E19.01.Using spectral analysis, e.g., transform vocoders, subband vocoders, perceptual audio coders, psychoacoustically based lossy encoding, etc., e.g., MPEG audio, Dolby AC-3, etc. (EPO)
 - * E19.011..Blocking, i.e., grouping of samples in time, choice of analysis window, overlap factor (EPO)
 - * E19.012..Detection of transients and attacks for time/frequency resolution switching (EPO)
 - * E19.013..Noise substitution, i.e., substituting nontonal spectral components by noisy source (EPO)
 - * E19.014..Spectral prediction for pre-echo prevention; temporal noise shaping (TNS), e.g., in MPEG2 or MPEG4, etc. (EPO)
 - * E19.015..Quantization or dequantization of spectral components (EPO)
 - * E19.016...Scalar quantization (EPO)
 - * E19.017...Vector quantization, e.g., Twin-VQ audio, etc. (EPO)
 - * E19.018..Using subband decomposition (EPO)
 - * E19.019...Subband vocoders (EPO)
 - * E19.02..Using orthogonal transformation (EPO)
 - * E19.021...Using wavelet decomposition (EPO)
 - * E19.022.Dynamic bit allocation (EPO)
 - * E19.023.Using predictive techniques; codecs based on source-filter modelization (EPO)
 - * E19.024..Determination or coding of the spectral characteristics, e.g., of the short-term prediction coefficients, etc. (EPO)
 - * E19.025...Line spectrum pair (LSP) vocoders (EPO)
 - * E19.026..Determination or coding of the excitation function; determination or coding of the long-term prediction characteristics (EPO)
 - * E19.027...Determination or coding of an excitation gain (EPO)

Title Change

* Newly Established Subclass

@ Indent Change

& Position Change

- SPEECH OR AUDIO SIGNAL ANALYSIS-
SYNTHESIS TECHNIQUES FOR
REDUNDANCY REDUCTION, E.G., IN
VOCODERS, ETC.; CODING OR
DECODING OF SPEECH OR AUDIO
SIGNALS; COMPRESSION OR
EXPANSION OF SPEECH OR AUDIO
SIGNALS, E.G., SOURCE-FILTER
MODELS, PSYCHOACOUSTIC
ANALYSIS, ETC. (EPO)**
- .Using predictive techniques;
codecs based on source-filter
modelization (EPO)
 - ..Determination or coding of the
excitation function;
determination or coding of the
long-term prediction
characteristics (EPO)
 - * E19.028...Using mixed excitation model,
e.g., MELP, MBE, Split band
LPC, HVXC, etc. (EPO)
 - * E19.029...Long-term prediction, i.e.,
removing periodical
redundancies, e.g., adaptive
codebook, pitch predictor,
etc. (EPO)
 - * E19.03...Using sinusoidal excitation
model (EPO)
 - * E19.031...Using prototype waveform
decomposition or waveform
interpolative coders (PWI)
(EPO)
 - * E19.032...Determination or coding of a
multipulse excitation (EPO)
 - * E19.033...Algebraic codebook; sparse
pulse excitation (EPO)
 - * E19.034...Regular pulse excitation
(EPO)
 - * E19.035...Determination or coding of a
code excitation; code excited
linear prediction (CELP)
vocoders (EPO)
 - * E19.036...Pitch excitation, e.g., PSI-
CELP (pitch synchronous
innovation CELP), etc. (EPO)
 - * E19.037...Residual excited linear
prediction (RELP) (EPO)
 - * E19.038...Vector sum excited linear
prediction (VSELP) (EPO)
 - * E19.039..Details of speech and audio
coders (EPO)
 - * E19.04...Vocoder architecture (EPO)
 - * E19.041...Vocoders using multiple
modes (EPO)
 - * E19.042....Using sound class specific
coding, hybrid encoders,
object-based coding (EPO)
 - * E19.043....Mode decision, i.e., based
on audio signal content versus
external parameter (EPO)
 - * E19.044....Variable rate or variable
quality codecs, e.g., scalable
representation encoding, etc.
(EPO)
 - * E19.045...Pre- or post-filtering (EPO)
 - * E19.046...Pre-filtering, e.g., high
frequency emphasis prior to
encoding, etc. (EPO)
 - * E19.047...Post-filtering, e.g., pitch
enhancement, formant emphasis
for decoder, etc. (EPO)
 - * E19.048...Audio streaming, i.e.,
formatting and decoding of an
encoded audio signal (EPO)
 - * E19.049...Transcoding, i.e.,
converting between two coded
representations avoiding
cascaded coding-decoding (EPO)
 - * E21.001**MODIFICATION OF AT LEAST ONE
CHARACTERISTIC OF SPEECH WAVES
(EPO)**
 - * E21.002.Speech enhancement, e.g., noise
reduction, echo cancellation,
etc. (EPO)
 - * E21.003..Applications (EPO)
 - * E21.004...Speech corrupted by noise
(EPO)
 - * E21.005....Periodic noise (EPO)
 - * E21.006....The noise being separate
speech (EPO)
 - * E21.007...Speech corrupted by echo-
reverberation (EPO)
 - * E21.008...Speech corrupted by stress-
Lombard effect (EPO)
 - * E21.009...Enhancement of
intelligibility of clean or
coded speech (EPO)
 - * E21.01....Enhancement of diverse speech
(EPO)
 - * E21.011....Bandwidth extension taking
place at the receiving side,
e.g., generation of low- or
high-frequency components,
regeneration of spectral
holes, etc. (EPO)
 - * E21.012...Separate reconstruction of
interference and of speech
signal (EPO)

Title Change
* Newly Established Subclass

@ Indent Change
& Position Change

**MODIFICATION OF AT LEAST ONE
CHARACTERISTIC OF SPEECH WAVES
(EPO)**

- ..Speech enhancement, e.g., noise reduction, echo cancellation, etc. (EPO)
- ..Applications (EPO)
- ...Separate reconstruction of interference and of speech signal (EPO)
- * E21.013...The interference being a separate speaker (EPO)
- * E21.014...Active noise canceling (EPO)
- * E21.015...Public address system (EPO)
- * E21.016...Suppression or repetition of time signal segments (EPO)
- * E21.017..Time compression or expansion (EPO)
- * E21.018..Suppression or repetition of time signal segments (EPO)
- * E21.019..Transformation of speech into a nonaudible representation, e.g., speech visualization, speech processing for tactile aids, etc. (EPO)
- * E21.02..Synchronization of speech with image or synthesis of the lips movement from speech, e.g., for "talking heads," etc. (EPO)
- * E11.001**MISCELLANEOUS ANALYSIS OR DETECTION OF SPEECH CHARACTERISTICS (EPO)**
- * E11.002..General speech analysis without concrete application (EPO)
- * E11.003..Detection of presence or absence of speech signals (EPO)
- * E11.004..Voice/data decision (EPO)
- * E11.005..End point detection (EPO)
- * E11.006..Pitch determination of speech signals (EPO)
- * E11.007..Voiced-unvoiced decision (EPO)
- * E13.001**SPEECH SYNTHESIS; TEXT TO SPEECH SYSTEMS (EPO)**
- * E13.002..Methods for producing synthetic speech; speech synthesizers (EPO)
- * E13.003..Concept-to-speech synthesizers; generation of natural phrases not from text but from machine-based concepts (EPO)
- * E13.004..Sound editing, manipulating voice of the synthesizer (EPO)

- * E13.005..Details of speech synthesis systems, e.g., synthesizer architecture, memory management, etc. (EPO)
- * E13.006..Architecture of speech synthesizers (EPO)
- * E13.007..Excitation (EPO)
- * E13.008..Systems using speech synthesizers (EPO)
- * E13.009..Elementary speech units used in speech synthesizers; concatenation rules (EPO)
- * E13.01..Concatenation (EPO)
- * E13.011..Text analysis, generation of parameters for speech synthesis out of text, e.g., grapheme to phoneme translation, prosody generation, stress, or intonation determination, etc. (EPO)
- * E13.012..Grapheme to phoneme, detection of language (EPO)
- * E13.013..Prosody rules derived from text (EPO)
- * E13.014..Stress or intonation (EPO)

FOREIGN ART COLLECTIONSFOR 000**CLASS-RELATED FOREIGN DOCUMENTS**

Title Change
* Newly Established Subclass

@ Indent Change
& Position Change

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PROJECT Y-7071

D. CHANGES TO THE DEFINITIONS

CLASS 704 – DATA PROCESSING: SPEECH SIGNAL PROCESSING, LINGUISTICS,
LANGUAGE TRANSLATION, AND AUDIO COMPRESSION/DECOMPRESSION

Definitions Established

E-SUBCLASSES

The E-subclasses in U.S. Class 704 provide for methods and devices for analyzing or synthesizing spoken language and for detecting, recognizing, or modifying speech signal characteristics.

- E11.001 MISCELLANEOUS ANALYSIS OR DETECTION OF SPEECH CHARACTERISTICS (EPO):**
This main group provides for processes and apparatus for analyzing or detecting speech characteristics not provided for elsewhere. This subclass is substantially the same in scope as ECLA classification G10L11/00.
- E11.002 General speech analysis without concrete application (EPO):**
This subclass is indented under subclass E11.001. This subclass is substantially the same in scope as ECLA classification G10L11/00A.
- E11.003 Detection of presence or absence of speech signals (EPO):**
This subclass is indented under subclass E11.001. This subclass is substantially the same in scope as ECLA classification G10L11/02.
- E11.004 Voice/data decision (EPO):**
This subclass is indented under subclass E11.003. This subclass is substantially the same in scope as ECLA classification G10L11/02D.
- E11.005 End point detection (EPO):**
This subclass is indented under subclass E11.003. This subclass is substantially the same in scope as ECLA classification G10L11/02E.
- E11.006 Pitch determination of speech signals (EPO):**
This subclass is indented under subclass E11.001. This subclass is substantially the same in scope as ECLA classification G10L11/04.
- E11.007 Voiced-unvoiced decision (EPO):**
This subclass is indented under subclass E11.001. This subclass is substantially the same in scope as ECLA classification G10L11/06.
- E13.001 SPEECH SYNTHESIS; TEXT TO SPEECH SYSTEMS (EPO):**
This main group provides for processes and apparatus for synthesizing speech. This subclass is substantially the same in scope as ECLA classification G10L13/00.
- E13.002 Methods for producing synthetic speech; speech synthesizers (EPO):**
This subclass is indented under subclass E13.001. This subclass is substantially the same in scope as ECLA classification G10L13/02.

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D. CHANGES TO THE DEFINITIONS

- E13.003 Concept-to-speech synthesizers; generation of natural phrases not from text but from machine-based concepts (EPO):**
This subclass is indented under subclass E13.002. This subclass is substantially the same in scope as ECLA classification G10L13/02C.
- E13.004 Sound editing, manipulating voice of the synthesizer (EPO):**
This subclass is indented under subclass E13.002. This subclass is substantially the same in scope as ECLA classification G10L13/02E.
- E13.005 Details of speech synthesis systems, e.g., synthesizer architecture, memory management, etc. (EPO):**
This subclass is indented under subclass E13.001. This subclass is substantially the same in scope as ECLA classification G10L13/04.
- E13.006 Architecture of speech synthesizers (EPO):**
This subclass is indented under subclass E13.005. This subclass is substantially the same in scope as ECLA classification G10L13/04A.
- E13.007 Excitation (EPO):**
This subclass is indented under subclass E13.005. This subclass is substantially the same in scope as ECLA classification G10L13/04E.
- E13.008 Systems using speech synthesizers (EPO):**
This subclass is indented under subclass E13.005. This subclass is substantially the same in scope as ECLA classification G10L13/04U.
- E13.009 Elementary speech units used in speech synthesizers; concatenation rules (EPO):**
This subclass is indented under subclass E13.001. This subclass is substantially the same in scope as ECLA classification G10L13/06.
- E13.01 Concatenation (EPO):**
This subclass is indented under subclass E13.009. This subclass is substantially the same in scope as ECLA classification G10L13/06C.
- E13.011 Text analysis, generation of parameters for speech synthesis out of text, e.g., grapheme to phoneme translation, prosody generation, stress, or intonation determination, etc. (EPO):**
This subclass is indented under subclass E13.001. This subclass is substantially the same in scope as ECLA classification G10L13/08.
- E13.012 Grapheme to phoneme, detection of language (EPO):**
This subclass is indented under subclass E13.011. This subclass is substantially the same in scope as ECLA classification G10L13/08G.
- E13.013 Prosody rules derived from text (EPO):**
This subclass is indented under subclass E13.011. This subclass is substantially the same in scope as ECLA classification G10L13/08P.

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D. CHANGES TO THE DEFINITIONS

- E13.014 Stress or intonation (EPO):**
This subclass is indented under subclass E13.011. This subclass is substantially the same in scope as ECLA classification G10L13/08S.
- E15.001 SPEECH RECOGNITION (EPO):**
This main group provides for processes, systems, and apparatus for the recognition of speech, including training of speech recognition systems, language recognition, speech classification and search, speech-to-text systems, and evaluation or assessment of speech recognition systems. This subclass is substantially the same in scope as ECLA classification G10L15/00.
- E15.002 Assessment or evaluation of speech recognition systems (EPO):**
This subclass is indented under subclass E15.001. This subclass is substantially the same in scope as ECLA classification G10L15/00A.
- E15.003 Language recognition (EPO):**
This subclass is indented under subclass E15.001. This subclass is substantially the same in scope as ECLA classification G10L15/00L.
- E15.004 Feature extraction for speech recognition; selection of recognition unit (EPO):**
This subclass is indented under subclass E15.001. This subclass is substantially the same in scope as ECLA classification G10L15/02.
- E15.005 Segmentation or word limit detection (EPO):**
This subclass is indented under subclass E15.001. This subclass is substantially the same in scope as ECLA classification G10L15/04.
- E15.006 Word boundary detection (EPO):**
This subclass is indented under subclass E15.005. This subclass is substantially the same in scope as ECLA classification G10L15/04W.
- E15.007 Creation of reference templates; training of speech recognition systems, e.g., adaptation to the characteristics of the speaker's voice, etc. (EPO):**
This subclass is indented under subclass E15.001. This subclass is substantially the same in scope as ECLA classification G10L15/06.
- E15.008 Training (EPO):**
This subclass is indented under subclass E15.007. This subclass is substantially the same in scope as ECLA classification G10L15/06T.
- E15.009 Adaptation (EPO):**
This subclass is indented under subclass E15.007. This subclass is substantially the same in scope as ECLA classification G10L15/06A.
- E15.01 In the frequency domain (EPO):**
This subclass is indented under subclass E15.009. This subclass is substantially the same in scope as ECLA classification G10L15/06A1.
- E15.011 To speaker (EPO):**
This subclass is indented under subclass E15.009. This subclass is substantially the same in scope as ECLA classification G10L15/06A3.

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- E15.012 Supervised, i.e., under machine guidance (EPO):**
This subclass is indented under subclass E15.011. This subclass is substantially the same in scope as ECLA classification G10L15/06A3S.
- E15.013 Unsupervised (EPO):**
This subclass is indented under subclass E15.011. This subclass is substantially the same in scope as ECLA classification G10L15/06A3U.
- E15.014 Speech classification or search (EPO):**
This subclass is indented under subclass E15.001. This subclass is substantially the same in scope as ECLA classification G10L15/08.
- E15.015 Using distance or distortion measures between unknown speech and reference templates (EPO):**
This subclass is indented under subclass E15.014. This subclass is substantially the same in scope as ECLA classification G10L15/10.
- E15.016 Using dynamic programming techniques, e.g., Dynamic Time Warping (DTW), etc. (EPO):**
This subclass is indented under subclass E15.014. This subclass is substantially the same in scope as ECLA classification G10L15/12.
- E15.017 Using artificial neural networks (EPO):**
This subclass is indented under subclass E15.014. This subclass is substantially the same in scope as ECLA classification G10L15/16.
- E15.018 Using natural language modeling (EPO):**
This subclass is indented under subclass E15.014. This subclass is substantially the same in scope as ECLA classification G10L15/18.
- E15.019 Using context dependencies, e.g., language models, etc. (EPO):**
This subclass is indented under subclass E15.018. This subclass is substantially the same in scope as ECLA classification G10L15/18C.
- E15.02 Phonemic context, e.g., pronunciation rules, phonotactical constraints, phoneme n-grams, etc. (EPO):**
This subclass is indented under subclass E15.019. This subclass is substantially the same in scope as ECLA classification G10L15/18C1.
- E15.021 Grammatical context, e.g., disambiguation of the recognition hypotheses based on word sequence rules, etc. (EPO):**
This subclass is indented under subclass E15.019. This subclass is substantially the same in scope as ECLA classification G10L15/18C2.
- E15.022 Formal grammars, e.g., finite state automata, context free grammars, word networks, etc. (EPO):**
This subclass is indented under subclass E15.021. This subclass is substantially the same in scope as ECLA classification G10L15/18C2F.

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- E15.023 Probabilistic grammars, e.g., word n-grams, etc. (EPO):**
This subclass is indented under subclass E15.021. This subclass is substantially the same in scope as ECLA classification G10L15/18C2S.
- E15.024 Semantic context, e.g., disambiguation of the recognition hypotheses based on word meaning, etc. (EPO):**
This subclass is indented under subclass E15.019. This subclass is substantially the same in scope as ECLA classification G10L15/18C3.
- E15.025 Using prosody or stress (EPO):**
This subclass is indented under subclass E15.018. This subclass is substantially the same in scope as ECLA classification G10L15/18P.
- E15.026 Parsing for meaning understanding (EPO):**
This subclass is indented under subclass E15.018. This subclass is substantially the same in scope as ECLA classification G10L15/18U.
- E15.027 Using statistical models, e.g., Hidden Markov Models (HMMs), etc. (EPO):**
This subclass is indented under subclass E15.014. This subclass is substantially the same in scope as ECLA classification G10L15/14.
- E15.028 Hidden Markov Models (HMMs) (EPO):**
This subclass is indented under subclass E15.027. This subclass is substantially the same in scope as ECLA classification G10L15/14M.
- E15.029 Training of Hidden Markov Models (HMMs) (EPO):**
This subclass is indented under subclass E15.028. This subclass is substantially the same in scope as ECLA classification G10L15/14M1.
- E15.03 With insufficient amount of training data, e.g., state sharing, tying, deleted interpolation, etc. (EPO):**
This subclass is indented under subclass E15.029. This subclass is substantially the same in scope as ECLA classification G10L15/14M1S.
- E15.031 Duration modeling in Hidden Markov Models (HMMs), e.g., semi-HMM, segmental models, transition probabilities, etc. (EPO):**
This subclass is indented under subclass E15.028. This subclass is substantially the same in scope as ECLA classification G10L15/14M2.
- E15.032 Hidden Markov Models (HMMs) network (EPO):**
This subclass is indented under subclass E15.028. This subclass is substantially the same in scope as ECLA classification G10L15/14M3.
- E15.033 State emission probabilities (EPO):**
This subclass is indented under subclass E15.028. This subclass is substantially the same in scope as ECLA classification G10L15/14M4.
- E15.034 Continuous densities, e.g., Gaussian distribution, Laplace, etc. (EPO):**
This subclass is indented under subclass E15.033. This subclass is substantially the same in scope as ECLA classification G10L15/14M4C.

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- E15.035 Discrete densities, e.g., Vector Quantization preprocessor, look-up tables, etc. (EPO):**
This subclass is indented under subclass E15.033. This subclass is substantially the same in scope as ECLA classification G10L15/14M4D.
- E15.036 Neural Network (NN) as output probability estimator, e.g., hybrid HMM/NN, etc. (EPO):**
This subclass is indented under subclass E15.033. This subclass is substantially the same in scope as ECLA classification G10L15/14M4N.
- E15.037 Non-hidden Markov Model (EPO):**
This subclass is indented under subclass E15.027. This subclass is substantially the same in scope as ECLA classification G10L15/14N.
- E15.038 Recognition networks (EPO):**
This subclass is indented under subclass E15.014. This subclass is substantially the same in scope as ECLA classification G10L15/08N.
- E15.039 Speech recognition techniques for robustness in adverse environments, e.g., in noise, of stress induced speech, etc. (EPO):**
This subclass is indented under subclass E15.001. This subclass is substantially the same in scope as ECLA classification G10L15/20.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
E21.002 for speech enhancement.
- E15.04 Procedures used during a speech recognition process, e.g., man-machine dialogue, etc. (EPO):**
This subclass is indented under subclass E15.001. This subclass is substantially the same in scope as ECLA classification G10L15/22.
- E15.041 Speech recognition using nonacoustical features, e.g., position of the lips, etc. (EPO):**
This subclass is indented under subclass E15.001. This subclass is substantially the same in scope as ECLA classification G10L15/24.
- E15.042 Using position of the lips, movement of the lips, or face analysis (EPO):**
This subclass is indented under subclass E15.041. This subclass is substantially the same in scope as ECLA classification G10L15/24L.
- E15.043 Speech to text systems (EPO):**
This subclass is indented under subclass E15.001. This subclass is substantially the same in scope as ECLA classification G10L15/26.
- E15.044 Speech recognition depending on application context, e.g., in a computer, etc. (EPO):**
This subclass is indented under subclass E15.043. This subclass is substantially the same in scope as ECLA classification G10L15/26C.

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- E15.045 Systems using speech recognizers (EPO):**
This subclass is indented under subclass E15.043. This subclass is substantially the same in scope as ECLA classification G10L15/26A.
- E15.046 Constructional details of speech recognition systems (EPO):**
This subclass is indented under subclass E15.001. This subclass is substantially the same in scope as ECLA classification G10L15/28.
- E15.047 Distributed recognition, e.g., in client-server systems for mobile phones or network applications, etc. (EPO):**
This subclass is indented under subclass E15.046. This subclass is substantially the same in scope as ECLA classification G10L15/28D.
- E15.048 Memory allocation or algorithm optimization to reduce hardware requirements (EPO):**
This subclass is indented under subclass E15.046. This subclass is substantially the same in scope as ECLA classification G10L15/28H.
- E15.049 Multiple recognizers used in sequence or in parallel; corresponding voting or score combination systems (EPO):**
This subclass is indented under subclass E15.046. This subclass is substantially the same in scope as ECLA classification G10L15/28M.
- E15.05 Recognizers for parallel processing (EPO):**
This subclass is indented under subclass E15.046. This subclass is substantially the same in scope as ECLA classification G10L15/28P.
- E17.001 SPEAKER IDENTIFICATION OR VERIFICATION (EPO):**
This main group provides for processes and apparatus for recognizing special voice characteristics, systems using speaker recognizers and details of speaker identification or verification processes or apparatus. This subclass is substantially the same in scope as ECLA classification G10L17/00.
- E17.002 Recognition of special voice characteristics, e.g., for use in a lie detector; recognition of animal voices, etc. (EPO):**
This subclass is indented under subclass E17.001. This subclass is substantially the same in scope as ECLA classification G10L17/00C.
- E17.003 Systems using speaker recognizers (EPO):**
This subclass is indented under subclass E17.001. This subclass is substantially the same in scope as ECLA classification G10L17/00U.
- E17.004 Details (EPO):**
This subclass is indented under subclass E17.001. This subclass is substantially the same in scope as ECLA classification G10L17/00B2.
- E17.005 Preprocessing operations, e.g., segment selection, etc.; pattern representation or modeling, e.g., based on linear discriminant analysis (LDA), principal components, etc.; feature selection or extraction (EPO):**
This subclass is indented under subclass E17.004. This subclass is substantially the same in scope as ECLA classification G10L17/00B2.

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- E17.006 Training, model building, enrollment (EPO):**
This subclass is indented under subclass E17.004. This subclass is substantially the same in scope as ECLA classification G10L17/00B6.
- E17.007 Decision making techniques, pattern matching strategies (EPO):**
This subclass is indented under subclass E17.004. This subclass is substantially the same in scope as ECLA classification G10L17/00B8.
- E17.008 Use of particular distance or distortion metric between probe pattern and reference templates (EPO):**
This subclass is indented under subclass E17.007. This subclass is substantially the same in scope as ECLA classification G10L17/00B8D.
- E17.009 Multimodal systems, i.e., based on the integration of multiple recognition engines or experts fusion (EPO):**
This subclass is indented under subclass E17.007. This subclass is substantially the same in scope as ECLA classification G10L17/00B8M.
- E17.01 Score normalization (EPO):**
This subclass is indented under subclass E17.007. This subclass is substantially the same in scope as ECLA classification G10L17/00B8N.
- E17.011 Use of phonemic categorization or speech recognition prior to speaker recognition or verification (EPO):**
This subclass is indented under subclass E17.007. This subclass is substantially the same in scope as ECLA classification G10L17/00B8P.
- E17.012 Hidden Markov Models (HMM) (EPO):**
This subclass is indented under subclass E17.004. This subclass is substantially the same in scope as ECLA classification G10L17/00B14.
- E17.013 Artificial neural networks, connectionist approaches (EPO):**
This subclass is indented under subclass E17.004. This subclass is substantially the same in scope as ECLA classification G10L17/00B16.
- E17.014 Pattern transformations and operations aimed at increasing system robustness, e.g., against channel noise, different working conditions, etc. (EPO):**
This subclass is indented under subclass E17.004. This subclass is substantially the same in scope as ECLA classification G10L17/00B20.
- E17.015 Interactive procedures, man-machine interface (EPO):**
This subclass is indented under subclass E17.004. This subclass is substantially the same in scope as ECLA classification G10L17/00B22.
- E17.016 User prompted to utter a password or predefined text (EPO):**
This subclass is indented under subclass E17.015. This subclass is substantially the same in scope as ECLA classification G10L17/00B22P.

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E19.001 SPEECH OR AUDIO SIGNAL ANALYSIS-SYNTHESIS TECHNIQUES FOR REDUNDANCY REDUCTION, E.G., IN VOCODERS, ETC.; CODING OR DECODING OF SPEECH OR AUDIO SIGNALS; COMPRESSION OR EXPANSION OF SPEECH OR AUDIO SIGNALS, E.G., SOURCE-FILTER MODELS, PSYCHOACOUSTIC ANALYSIS, ETC. (EPO):

This main group provides for processes and apparatus for the coding, decoding, compression or expansion of speech or audio signals, including techniques for redundancy reduction, and psychoacoustic analysis. This subclass is substantially the same in scope as ECLA classification G10L19/00.

SEE OR SEARCH THIS CLASS, SUBCLASS:

E21.016, for time compression or expansion of speech waves.

E19.002 Perceptual measures for quality assessment (EPO):

This subclass is indented under subclass E19.001. This subclass is substantially the same in scope as ECLA classification G10L19/00A.

E19.003 Correction of errors induced by the transmission channel, if related to the coding (EPO):

This subclass is indented under subclass E19.001. This subclass is substantially the same in scope as ECLA classification G10L19/00E.

E19.004 Lossless audio signal coding; perfect reconstruction of coded audio signal by transmission of coding error (EPO):

This subclass is indented under subclass E19.001. This subclass is substantially the same in scope as ECLA classification G10L19/00L.

E19.005 Multichannel audio signal coding and decoding, i.e., using interchannel correlation to reduce redundancies, e.g., joint-stereo, intensity-coding, matrixing, etc. (EPO):

This subclass is indented under subclass E19.001. This subclass is substantially the same in scope as ECLA classification G10L19/00M.

E19.006 Comfort noise, silence coding (EPO):

This subclass is indented under subclass E19.001. This subclass is substantially the same in scope as ECLA classification G10L19/00N.

E19.007 Speech coding using phonetic or linguistic decoding of the source; reconstruction using text-to-speech synthesis (EPO):

This subclass is indented under subclass E19.001. This subclass is substantially the same in scope as ECLA classification G10L19/00S.

E19.008 Systems using vocoders (EPO):

This subclass is indented under subclass E19.001. This subclass is substantially the same in scope as ECLA classification G10L19/00U.

E19.009 Audio watermarking, i.e., embedding inaudible data in the audio signal (EPO):

This subclass is indented under subclass E19.001. This subclass is substantially the same in scope as ECLA classification G10L19/00W.

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- E21.017 Time compression or expansion (EPO):**
This subclass is indented under subclass E21.001. This subclass is substantially the same in scope as ECLA classification G10L21/04.
- E21.018 Suppression or repetition of time signal segments (EPO):**
This subclass is indented under subclass E21.017. This subclass is substantially the same in scope as ECLA classification G10L21/04R.
- E21.019 Transformation of speech into a nonaudible representation, e.g., speech visualization, speech processing for tactile aids, etc. (EPO):**
This subclass is indented under subclass E21.001. This subclass is substantially the same in scope as ECLA classification G10L21/06.
- E21.02 Synchronization of speech with image or synthesis of the lips movement from speech, e.g., for “talking heads,” etc. (EPO):**
This subclass is indented under subclass E21.019. This subclass is substantially the same in scope as ECLA classification G10L21/06L.