CCITT SGXV
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Specialists Group on Coding for Visual Telephony

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TITLE : Patents Relevant to the Flexible Hardware Specification (Issue 2)

This document lists up the patents which may be relevant to the Flexible Hardware specification based upon the submitted documents, #124, #161, #172, #209, #238, #262 and #278. Attached § numbers refer to corresponding sections in Doc. #249 (Flexible Hardware specification). It should be noted that further study is required for identifying to what extent these patents are relevant to the Flexible Hardware specification.

The list also includes those patents which are related to the implementation of the specification.

Reference to the corresponding part of the Recommendation will be made if it is drafted.

This document is an updated version of TD No. 3(Red Bank). Amendments are indicated by lines in the left margin.

US 3,632,865 (Jan. 4, 1972)
PREDICTIVE VIDEO ENCODING USING MEASURED SUBJECTIVE VELOCITY
B. Haskell, J.O. Limb
Bell Telephone Laboratories
- Motion compensated interframe prediction.
- One vector per moving region.

§1.2.2

US 3,679,821 (July 25, 1972)
TRANSFORM CODING OF IMAGE DIFFERENCE SIGNALS
M.R. Shroeder
Bell Telephone Laboratories
- Prediction errors are transformed, quantized.

§1.2

US 4,281,344 (July 28, 1981)
VIDEO INTERFRAME TRANSFORM CODING TECHNIQUE
F.W. Mounts, A.N. Netravali
Bell Telephone Laboratories
- Interframe prediction errors are transformed. Non significant error pels are replaced by some significant pels, thus number of transmitted coefficients are reduced.
- Shares common idea with variable blocksize transform.

§1.2

US 3,553,361 (Jan. 5, 1971)
CONDITIONAL REPLENISHMENT VIDEO SYSTEM SAMPLE GROUPING
US 3,553,362 (Jan. 5, 1971)
CONDITIONAL REPLENISHMENT VIDEO SYSTEM WITH RUN LENGTH CODING OF POSITION
F.W. Mounts
Bell Telephone Laboratories
- Conditional replenishment with PCM.
- Number of consecutive significant pels are coded with RLC/EOR.

§1.2.3

US 3,609,244 (Sep. 28, 1971)
CONDITIONAL REPLENISHMENT VIDEO SYSTEM WITH VARIABLE LENGTH ADDRESS CODE
F.W. Mounts
Bell Telephone Laboratories
- Address of significant samples are transmitted as the length of the interval between the location of its respective sample and the of the group.
- Address is variable length coded.

§2.2.3

US 4,541,012 (Jan. 4, 1982) / EP 0,084,270
VIDEO BANDWIDTH REDUCTION SYSTEM EMPLOYING INTERFRAME BLOCK DIFFERENCING AND TRANSFORM DOMAIN CODING
A.G. Tesher
Compression Labs, Inc.
- Block based conditional replenishment according to interframe difference.
- Significant blocks are transformed.
- Relevant to the 'intra mode' of the Flexible Hardware.

§1.2.3

JP 57-041069-A (Mar. 6, 1982)
INTERFRAME-ENCODING SYSTEM
H.Kuroda, T.Matsuoka
NTT
- Demand refresh

§3.7

JP 60-029068-A (Feb. 14, 1985)
TRANSMISSION ERROR DETECTION SYSTEM
M. Nishiwaki, S. Tsugane, H. Kuroda, N. Mukawa, K. Matsuda, M. Hiraoka
NEC, NTT, FUJITSU
- Parity check between frame memory contents in the coder and decoder for demand refresh.

§2.2.1

US XXXXXX (applied Jan. 7, 1986)
PictureTel Corp.
- Filtering control of the motion compensated block by sending side information.

§1.2.1

JP 61-288678-A (Dec. 18, 1986)
QUANTIZING NOISE SUPPRESSING SYSTEM IN INTERFRAME CODING
H. Kuroda, H. Hashimoto
NTT
- Motion vector control of loop filter
§1.2.1

US 4,562,466 (Dec. 31, 1985)
DIGITAL DATA TRANSMISSION/RECEPTION HAVING ADAPTIVE ERROR CONTROL
C.S. Clapp, D.P. Devimeux, JC.R. Jolivet, A.Riou, N.L. Shilston
BT
- Lines of the raster are numbered cyclically in groups of 8, the numbers being part of line synchronizing code words
§2.2.1

US 4,698,672 (Dec. 6, 1987)
CODING SYSTEM FOR REDUNDANCY REDUCTION
W. Chen, D.J. Klenke
CLI
- Two runlength coding codes, one is for the run followed by the first non-zero value, the second is for the run followed by other non-zero values
§2.2.3?

Note: Block matching motion compensation scheme first appeared in an IECEJ convention record published in July 1974 (July 25-27). The paper was authored by Y. Taki, M. Hatori and S. Tanaka (Tokyo University). The scheme was not filed as a patent.

IMPLEMENTATION METHODS

The following patents are not directly relevant to the Flexible Hardware specification but describe implementation methods.

EP 113514-A (Nov. 30, 1982)
TELEVISION SIGNAL TRANSMISSION SYSTEM USING CONDITIONAL REPLENISHMENT - USES DIFFERING SCANNING RATES FOR TRANSMITTER AND RECEIVER WHICH USES STANDARD RATE
M.D. Carr, D.G. Morrison, R.C. Nicol
BT
- Asynchronous operation between coder and decoder
§3.4, §1.1

EP 103380-A (July 23, 1982)
TRANSMISSION OF VIDEO INFORMATION USING CONDITIONAL REPLENISHMENT - HAS DATA FED TO PATH AT CONSTANT RATE FROM ENCODER BUFFER AND RECEIVED AT DECODER BUFFER, AND DATA READ AT UNEVEN RATE FROM BUFFER
JC.R. Jolivet, D.P. Devimeux, S.K. Clapp, A. Riou, N.L. Shilston
BT
- Marker signals are stored in an auxiliary buffer store for reference by the reading device.
§3.4

JP 55-158784-A (Dec. 10, 1980)
INTER-FRAME CODING DEVICE
A. Hirano
NEC
- Multi-step motion vector detection
§1.2.2

JP 56-143776-A (Nov. 9, 1981)
INTERFRAME ENCODER
A. Hirano
NEC
- Multi-step motion vector detection with use of the previous frame motion vector as the first step
§1.2.2

JP 57-037988-A (Mar. 2, 1982)
TELEVISION SIGNAL ENCODING EQUIPMENT
A. Hirano
NEC
- Matching error accumulation method using quantized values
§1.2.2

JP 58-107785-A (June 27, 1983)
ENCODER BETWEEN MOVEMENT COMPENSATION FRAMES
A. Hirano
NEC
- Use of forced simple interframe prediction
§1.2.2

JP 60-146588-A (Aug. 2, 1985)
SYSTEM AND DEVICE FOR ENCODING ANIMATION PICTURE SIGNAL
J. Ooki
NEC
- Halting of motion compensation in case of update operation
§1.2.2

XXXXXX (applied 9 July 1987)
CLASSIFIER IMPLEMENTATION
BT
- Circuit to find the optimum order of transmission for a set of transform coefficients
§1.2.5

END

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