EXHIBIT A-10

SECONDARY REFERENCES

U.S. PATENT NO. 7,532,808

The references below qualify as prior art to U.S. Patent No. 7,532,808 (the "'808 patent") under one or more of pre-AIA 35 U.S.C. § 102(a), (b), or (e) or 35 U.S.C. § 103 and render obvious, in combination with other references as specified in the cover pleading to Respondents' Invalidity Contentions, and further in light of the knowledge of one of ordinary skill in the art, one or more of claims 1-2, 6-7, 9-11, 15-16, 20-25, 28-30, 32, 34, 36, 39-41, 43-44, 47-49, 51-54, 58-60, 62-65 of the '808 patent.

- Applicant Admitted Prior Art from the '808 patent ("The '808 patent")
- U.S. Patent No. 5,781,249 ("Hwang") (RESPNOKIA_00006303)
- U.S. Patent No. 6,560,280 ("Shachar") (RESPNOKIA_00006857)
- U.S. Patent No. 5,151,784 ("Lavagetto") (RESPNOKIA_00005836)
- U.S. Patent No. 5,784,108 ("Skaletzky") (RESPNOKIA_00006313)
- U.S. Patent No. 6,295,376 ("Nakaya") (RESPNOKIA_00000809)
- U.S. Patent No. 6,683,987 ("Sugahara") (RESPNOKIA_00009283)
- Hsieh, C-H., P-C. Lu, and J-S. Shyn, "Motion estimation using interblock correlation" ("Hsieh") (RESPNOKIA_00000951)
- JP 2001-251627 ("Kuriki") (RESPNOKIA_00000201) (RESPNOKIA_00009369)
- ITU - Telecommunications Standardized Sector of ITU, ITU-T DRAFT H.263, May 1996 ("H.263") (RESPNOKIA_00000252)
- Lee et al., "Efficient MPEG-2 Encoding of Interlaced Video" ("Lee") (RESPNOKIA_00000974)

To the extent that these Invalidity Contentions rely on or otherwise embody particular constructions of terms or phrases in the Asserted Claims, Respondents are not proposing any such constructions as proper constructions of those terms or phrases. Various positions put forth in this document are predicated on Complainants' incorrect and overly broad interpretation of its claims. Those positions are not intended to and do not necessarily reflect Respondents' interpretation of the true and proper scope of Complainants' claims, and Respondents reserve the right to adopt claim construction positions that differ from or even conflict with various positions put forth in this document.

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- Weigand, Thomas, JVT-A003 ("JVT-A003") (RESPNOKIA_00002443)

ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
1[preamble] A method of encoding a video sequence, the method comprising:	The below references, as evidence by the example citations, disclose a method of encoding a video sequence. *See, e.g.*, The '808 patent, 4:44-60: In order to illustrate the operation of a generic video coding system in greater detail, reference will now be made to the exemplary video encoder and video decoder illustrated in FIGS. 1 and 2 of the accompanying drawings. The video encoder 100 of FIG. 1 employs a combination of INTRA- and INTER-coding to produce a compressed (encoded) video bit-stream and decoder 200 of FIG. 2 is arranged to receive and decode the video bit-stream produced by encoder 100 in order to produce a reconstructed video sequence. Throughout the following description it will be assumed that the luminance component of a macroblock comprises 16×16 pixels arranged as an array of 4, 8×8 blocks, and that the associated chrominance components are spatially sub-sampled by a factor of two in the horizontal and vertical directions to form 8×8 blocks, as depicted in FIG. 3. Extension of the description to other block sizes and other sub-sampling schemes will be apparent to those of ordinary skill in the art. The '808 patent, 3:61-8:18 The video encoder 100 comprises an input 101 for receiving a digital video signal from a camera or other video source (not shown). It also comprises a transformation unit 104 which is arranged to perform a block-based discrete cosine transform (DCT), a quantizer 106, an inverse quantizer 108, an inverse transformation unit 110, arranged to perform an inverse block-based discrete cosine transform (IDCT), combiners 112 and 116, and a frame store 120. The encoder further comprises a motion estimator 130, a motion field coder 140 and a motion compensated predictor 150. Switches 102 and 114 are operated co-operatively by control manager 160 to switch the encoder between an INTRA-mode of video encoding and an INTER-mode of video

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	encoding. The encoder 100 also comprises a video multiplex coder 170 which forms a single bit-stream from the various types of information produced by the encoder 100 for further transmission to a remote receiving terminal or, for example, for storage on a mass storage medium, such as a computer hard drive (not shown). Encoder 100 operates as follows. Each frame of uncompressed video provided from the video source to input 101 is received and processed macroblock by macroblock, preferably in raster-scan order. When the encoding of a new video sequence starts, the first frame to be encoded is encoded as an INTRA-coded frame. Subsequently, the encoder is programmed to code each frame in INTER-coded format, unless one of the following conditions is met: 1) it is judged that the current macroblock of the frame being coded is so dissimilar from the pixel values in the reference frame used in its prediction that excessive prediction error information is produced, in which case the current macroblock is coded in INTRA-coded format; 2) a predefined INTRA frame repetition interval has expired; or 3) feedback is received from a receiving terminal indicating a request for a frame to be provided in INTRA-coded format. The occurrence of condition 1) is detected by monitoring the output of the combiner 116. The combiner 116 forms a difference between the current macroblock of the frame being coded and its prediction, produced in the motion compensated prediction block 150. If a measure of this difference (for example a sum of absolute differences of pixel values) exceeds a predetermined threshold, the combiner 116 informs the control manager 160 via a control line 119 and the control manager 160 operates the switches 102 and 114 via control line 113 so as to switch the encoder 100 into INTRA-coding mode. In this way, a frame which is otherwise encoded in INTER-coded format may comprise INTRA-coded macroblocks. Occurrence of condition 2) is monitored by means of a timer or frame counter implemented in the control manager 160, in such a way that if the timer expires, or the frame counter reaches a predetermined number of frames, the control manager 160 operates the switches 102 and 114 via control line 113 to switch the encoder into INTRA-coding mode. Condition 3) is triggered if the control manager 160 receives a feedback signal from, for example, a receiving terminal, via control line 121

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	indicating that an INTRA frame refresh is required by the receiving terminal. Such a condition may arise, for example, if a previously transmitted frame is badly corrupted by interference during its transmission, rendering it impossible to decode at the receiver. In this situation, the receiving decoder issues a request for the next frame to be encoded in INTRA-coded format, thus re-initialising the coding sequence. Operation of the encoder 100 in INTRA-coding mode will now be described. In INTRA-coding mode, the control manager 160 operates the switch 102 to accept video input from input line 118. The video signal input is received macroblock by macroblock from input 101 via the input line 118. As they are received, the blocks of luminance and chrominance values which make up the macroblock are passed to the DCT transformation block 104, which performs a 2-dimensional discrete cosine transform on each block of values, producing a 2-dimensional array of DCT coefficients for each block. DCT transformation block 104 produces an array of coefficient values for each block, the number of coefficient values corresponding to the dimensions of the blocks which make up the macroblock (in this case 8×8). The DCT coefficients for each block are passed to the quantizer 106, where they are quantized using a quantization parameter QP. Selection of the quantization parameter QP is controlled by the control manager 160 via control line 115. The array of quantized DCT coefficients for each block is then passed from the quantizer 106 to the video multiplex coder 170, as indicated by line 125 in FIG. 1. The video multiplex coder 170 orders the quantized transform coefficients for each block using a zigzag scanning procedure, thereby converting the two-dimensional array of quantized transform coefficients into a one-dimensional array. Each non-zero valued quantized coefficient in the one dimensional array is then represented as a pair of values, referred to as level and run, where level is the value of the quantized coefficient and run is the number of consecutive zero-valued coefficients preceding the coefficient in question. The run and level values are further compressed in the video multiplex coder 170 using entropy coding, for example, variable

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	length coding (VLC), or arithmetic coding. Once the run and level values have been entropy coded using an appropriate method, the video multiplex coder 170 further combines them with control information, also entropy coded using a method appropriate for the kind of information in question, to form a single compressed bit-stream of coded image information 135. It should be noted that while entropy coding has been described in connection with operations performed by the video multiplex coder 170, in alternative implementations a separate entropy coding unit may be provided. A locally decoded version of the macroblock is also formed in the encoder 100. This is done by passing the quantized transform coefficients for each block, output by quantizer 106, through inverse quantizer 108 and applying an inverse DCT transform in inverse transformation block 110. In this way a reconstructed array of pixel values is constructed for each block of the macroblock. The resulting decoded image data is input to combiner 112. In INTRA-coding mode, switch 114 is set so that the input to the combiner 112 via switch 114 is zero. In this way, the operation performed by combiner 112 is equivalent to passing the decoded image data unaltered. As subsequent macroblocks of the current frame are received and undergo the previously described encoding and local decoding steps in blocks 104, 106, 108, 110 and 112, a decoded version of the INTRA-coded frame is built up in frame store 120. When the last macroblock of the current frame has been INTRA-coded and subsequently decoded, the frame store 120 contains a completely decoded frame, available for use as a motion prediction reference frame in coding a subsequently received video frame in INTER-coded format. Operation of the encoder 100 in INTER-coding mode will now be described. In INTER-coding mode, the control manager 160 operates switch 102 to receive its input from line 117, which comprises the output of combiner 116. The combiner 116 receives the video input signal macroblock by macroblock from input 101. As combiner 116 receives the blocks of luminance

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	and chrominance values which make up the macroblock, it forms corresponding blocks of prediction error information. The prediction error information represents the difference between the block in question and its prediction, produced in motion compensated prediction block 150. More specifically, the prediction error information for each block of the macroblock comprises a two-dimensional array of values, each of which represents the difference between a pixel value in the block of luminance or chrominance information being coded and a decoded pixel value obtained by forming a motion-compensated prediction for the block, according to the procedure to be described below. Thus, in the exemplary video coding system considered here where each macroblock comprises, for example, an assembly of 8×8 blocks comprising luminance and chrominance values, the prediction error information for each block of the macroblock similarly comprises an 8×8 array of prediction error values. The prediction error information for each block of the macroblock is passed to DCT transformation block 104, which performs a two-dimensional discrete cosine transform on each block of prediction error values to produce a two-dimensional array of DCT transform coefficients for each block. DCT transformation block 104 produces an array of coefficient values for each prediction error block, the number of coefficient values corresponding to the dimensions of the blocks which make up the macroblock (in this case 8×8). The transform coefficients derived from each prediction error block are passed to quantizer 106 where they are quantized using a quantization parameter QP, in a manner analogous to that described above in connection with operation of the encoder in INTRA-coding mode. As before, selection of the quantization parameter QP is controlled by the control manager 160 via control line 115. The quantized DCT coefficients representing the prediction error information for each block of the macroblock are passed from quantizer 106 to video multiplex coder 170, as indicated by line 125 in FIG. 1. As in INTRA-coding mode, the video multiplex coder 170 orders the transform coefficients for each prediction error block using a certain zigzag scanning procedure and then represents each non-zero valued quantized coefficient as a run-level pair. It further

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	compresses the run-level pairs using entropy coding, in a manner analogous to that described above in connection with INTRA-coding mode. Video multiplex coder 170 also receives motion vector information (described in the following) from motion field coding block 140 via line 126 and control information from control manager 160. It entropy codes the motion vector information and control information and forms a single bit-stream of coded image information, 135 comprising the entropy coded motion vector, prediction error and control information. The quantized DCT coefficients representing the prediction error information for each block of the macroblock are also passed from quantizer 106 to inverse quantizer 108. Here they are inverse quantized and the resulting blocks of inverse quantized DCT coefficients are applied to inverse DCT transform block 110, where they undergo inverse DCT transformation to produce locally decoded blocks of prediction error values. The locally decoded blocks of prediction error values are then input to combiner 112. In INTER-coding mode, switch 114 is set so that the combiner 112 also receives predicted pixel values for each block of the macroblock, generated by motion-compensated prediction block 150. The combiner 112 combines each of the locally decoded blocks of prediction error values with a corresponding block of predicted pixel values to produce reconstructed image blocks and stores them in frame store 120. As subsequent macroblocks of the video signal are received from the video source and undergo the previously described encoding and decoding steps in blocks 104, 106, 108, 110, 112, a decoded version of the frame is built up in frame store 120. When the last macroblock of the frame has been processed, the frame store 120 contains a completely decoded frame, available for use as a motion prediction reference frame in encoding a subsequently received video frame in INTER-coded format. The details of the motion-compensated prediction performed by video encoder 100 will now be considered. Any frame encoded in INTER-coded format requires a reference frame for motion-

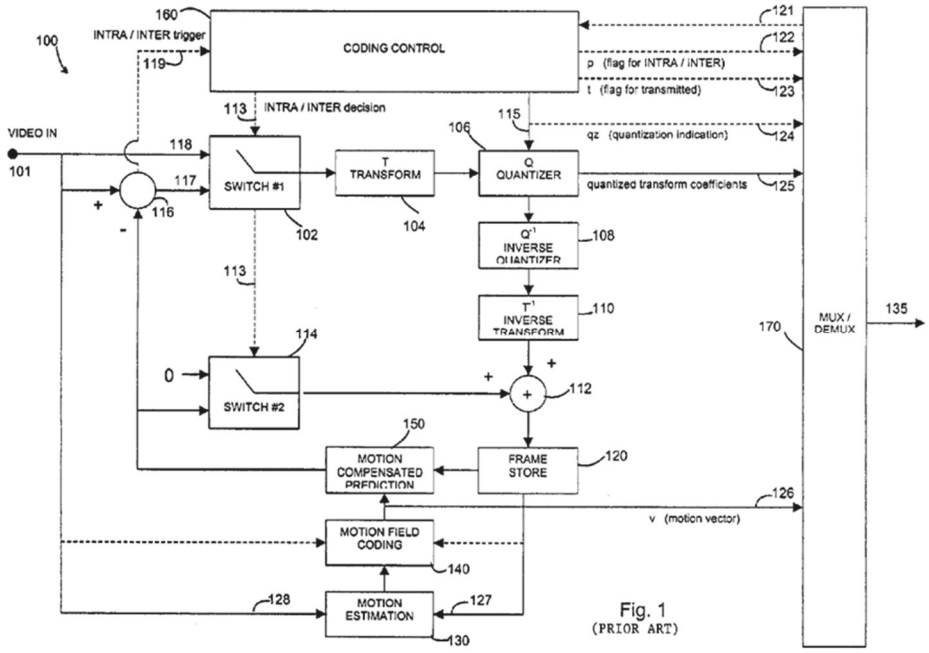
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	compensated prediction. This means, necessarily, that when encoding a video sequence, the first frame to be encoded, whether it is the first frame in the sequence, or some other frame, must be encoded in INTRA-coded format. This, in turn, means that when the video encoder 100 is switched into INTER-coding mode by control manager 160, a complete reference frame, formed by locally decoding a previously encoded frame, is already available in the frame store 120 of the encoder. In general, the reference frame is formed by locally decoding either an INTRA-coded frame or an INTER-coded frame. In the following description it will be assumed that the encoder performs motion compensated prediction on a macroblock basis, i.e. a macroblock is the smallest element of a video frame that can be associated with motion information. It will further be assumed that a prediction for a given macroblock is formed by identifying a region of 16×16 values in the luminance component of the reference frame that shows best correspondence with the 16×16 luminance values of the macroblock in question. Motion-compensated prediction in a video coding system where motion information may be associated with elements smaller than a macroblock will be considered later in the text. The first step in forming a prediction for a macroblock of the current frame is performed by motion estimation block 130. The motion estimation block 130 receives the blocks of luminance and chrominance values which make up the current macroblock of the frame to be coded via line 128. It then performs a block matching operation in order to identify a region in the reference frame that corresponds best with the current macroblock. In order to perform the block matching operation, motion estimation block 130 accesses reference frame data stored in frame store 120 via line 127. More specifically, motion estimation block 130 performs block-matching by calculating difference values (e.g. sums of absolute differences) representing the difference in pixel values between the macroblock under examination and candidate best-matching regions of pixels from a reference frame stored in the frame store 120. A difference value is produced for candidate regions at all possible offsets within a predefined search region of the reference frame and motion estimation block 130 determines the smallest calculated

ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	difference value. The candidate region that yields the smallest difference value is selected as the best-matching region. The offset between the current macroblock and the best-matching region identified in the reference frame defines a "motion vector" for the macroblock in question. The motion vector typically comprises a pair of numbers, one describing the horizontal (Δx) between the current macroblock and the best-matching region of the reference frame, the other representing the vertical displacement (Δy). Once the motion estimation block 130 has produced a motion vector for the macroblock, it outputs the motion vector to the motion field coding block 140. The motion field coding block 140 approximates the motion vector received from motion estimation block 130 using a motion model comprising a set of basis functions and motion coefficients. More specifically, the motion field coding block 140 represents the motion vector as a set of motion coefficient values which, when multiplied by the basis functions, form an approximation of the motion vector. Typically, a translational motion model having only two motion coefficients and basis functions is used, but motion models of greater complexity may also be used. The motion coefficients are passed from motion field coding block 140 to motion compensated prediction block 150. Motion compensated prediction block 150 also receives the best-matching region of pixel values identified by motion estimation block 130 from frame store 120. Using the approximate representation of the motion vector generated by motion field coding block 140 and the pixel values of the best-matching region of pixels from the reference frame, motion compensated prediction block 150 generates an array of predicted pixel values for each block of the current macroblock. Each block of predicted pixel values is passed to combiner 116 where the predicted pixel values are subtracted from the actual (input) pixel values in the corresponding block of the current macroblock. In this way a set of prediction error blocks for the macroblock is obtained. The '808 patent, 16:1-14

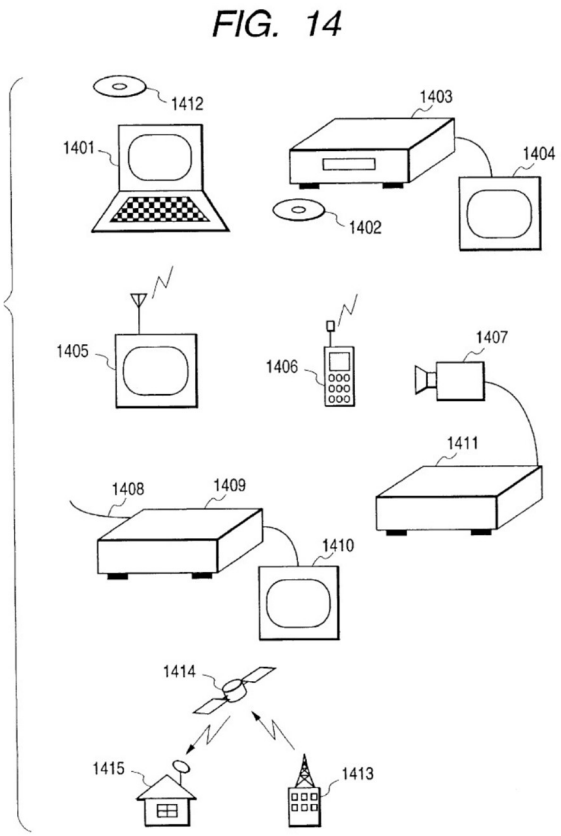
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	FIG. 6 is a schematic block diagram of a video encoder 600 implemented according to an embodiment of the invention. When encoding frames of a digital video sequence, encoder 600 operates in a manner similar to that previously described in connection with the prior art video encoder of FIG. 1 to generate INTRA-coded and INTER-coded compressed video frames. The structure of the video encoder shown in FIG. 6 is substantially identical to that of the prior art video encoder shown in FIG. 1, with appropriate modifications to the motion estimation part necessary to implement the video encoding method according to the invention. All parts of the video encoder which implement functions and operate in a manner identical to the previously described prior art video encoder are identified with identical reference numbers. The '808 patent, FIG. 1:

ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	 Fig. 1 (PRIOR ART) Nakaya, 11:64-12:47: Specific examples of coders and decoders using the coding method described in this specification is shown in FIG. 14. The image coding and decoding method can be utilized by installing image coding and decoding software into a computer 1401. This software is recorded in some kind of storage media (CD-ROM, floppy disk, hard disk, etc.) 1412, loaded into a computer and then used. Additionally, the computer can be used as an image communication terminal by connecting the computer to a communication lines. It is also possible to install the decoding method described in this specification into a player device 1403 that reads and

ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	decodes the coded bit stream recorded in a storage media 1402. In this case, the reconstructed image signal can be displayed on a television monitor 1404. The device 1403 can be used only for reading the coded bit stream, and in this case, the decoding device can be installed in the television monitor 1404. It is well known that digital data transmission can be realized using satellites and terrestrial waves. A decoding device can also be installed in a television receiver 1405 capable of receiving such digital transmissions. Also, a decoding device can also be installed inside a set top box 1409 connected to a satellite/terrestrial wave antenna, or a cable 1408 of a cable television system, so that the reconstructed images can be displayed on a television monitor 1410. In this case, the decoding device can be incorporated in the television monitor rather than in the set top box, as in the case of 1404. The layout of a digital satellite broadcast system is shown in 1413, 1414 and 1415. The video information in the coded bit stream is transmitted from a broadcast station 1413 to a communication or broadcast satellite 1414. The satellite receives this information, sends it to a home 1415 having equipment for receiving satellite broadcast programs, and the video information is reconstructed and displayed in this home using devices such as a television receiver or a set top box. Digital image communication using mobile terminals 1406 has recently attracted considerable attention, due to the fact that image communication at very low bit rates has become possible. Digital portable terminals can be categorized in the following three types: a transceiver having both an encoder and decoder; a transmitter having only an encoder; and a receiver having only a decoder. An encoding device can be installed in a video camera recorder 1407. The camera can also be used just for capturing the video signal and this signal can be supplied to a custom encoder 1411. All of the devices or systems shown in this drawing can be equipped with the coding or/and decoding method described in this specification. By using this coding or/and decoding method in these devices or systems, images of higher quality compared with those obtained using conventional technologies can be obtained.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	Nakaya, Fig. 14: 

ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	Hsieh, 995: In general moving scenes, motion objects often cover many small blocks such that the motion of the spatial neighbor blocks may be similar. In addition, due to the continuity of motion in temporal direction, the motion of the temporal neighbor blocks may be highly correlated. In other words, the motion vector of the current block can be predicted from that of the neighbor blocks in the temporal or spatial direction. Sugahara, 1:56-57. FIG. 19 is a general system block diagram showing an example of a basic configuration of an MPEG encoder. The operation will be described first for the case of forward prediction, i.e., deriving encoded data expressing a current input picture based upon the contents of a preceding reference picture, and considering only luminance values. In FIG. 19, data expressing successive ones of a stream of pictures are input to the decoder. Specifically, successive input pixel values of an input picture that is expressed as an array of pixels (for example, one frame of a progressive-scan video signal) are supplied to an adder 2 and a motion compensated prediction section 1. The input picture is pre-processed (in some manner that is not indicated in the drawing) to extract successive 16×16 pixel blocks which are referred to as macroblocks, with the pixel values of the currently extracted macroblock being supplied to the adder 2 and motion compensated prediction section 1. A picture memory 11 holds (as described hereinafter) a set of pixel values expressing a reference picture for use in processing a predictively encoded picture, or may hold a pair of reference pictures which respectively precede and succeed the a predictively encoded picture in the case of bidirectional encoding. With predictive encoding, the motion compensated prediction section 1 successively shifts the input macroblock with respect to the reference picture, within a predetermined search range, to determine whether there is a 16×16 array of pixels within the reference picture which has at least a predetermined minimum degree of correlation with the input macroblock. If such a condition is detected, then

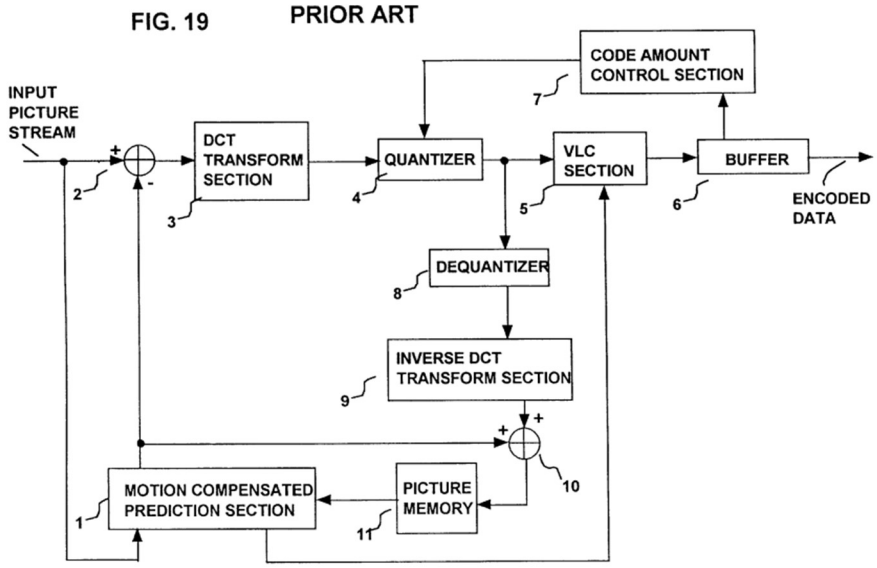
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	the amount and direction of displacement between that 16×16 pixel array in the reference picture and the input macroblock is obtained, as a vector value referred to as a motion vector (specifically, a combination of a horizontal and a vertical motion vector). The respective values of difference between the pixel values (i.e., luminance and chrominance values) of the input macroblock and the correspond pixels within that 16×16 array of pixels in the reference picture (read out from the picture memory 11 and supplied via the motion compensated prediction section 1) are then derived by the adder 2, and supplied to the DCT transform section 3, with these values being referred to as motion compensated prediction error values in the following. Prediction from a preceding reference picture process is referred to as forward prediction, and from a succeeding reference picture is referred to as backward prediction. If no correlated 16×16 block is found within the search range, then the input macroblock is intra-coded within the input picture, i.e., as an intra-coded block, generally referred to as an I-block. With bidirectional prediction, values for the input macroblock are predicted based on two 16×16 blocks of pixels within a preceding and a succeeding reference picture respectively. In MPEG, the basic unit for which different types of encoding can be specified is the macroblock. Depending upon the type of picture in which it is located and on decisions made by the encoder, a macroblock may be: (a) encoded entirely within a picture (i.e., intra-coded), independently of all other pictures, (b) encoded by forward prediction, i.e., as a set of prediction error values in conjunction with a motion vector, derived using a preceding reference picture, (b) encoded by backward prediction, i.e., as a set of prediction error values in conjunction with a motion vector, derived using a succeeding reference picture, or (c) encoded by bidirectional prediction, using both a preceding and a succeeding reference

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	picture. A picture can be encoded as: (a) an I-picture, in which case all of the macroblocks are I-macroblocks, i.e., are intra-coded within that picture, (b) a P-picture, in which case the encoder can selectively apply intra-coding or forward prediction encoding to the macroblocks, or (c) a B-picture, in which case the encoder can selectively apply intra-coding, forward prediction encoding, backward prediction encoding, or bidirectional prediction to the macroblocks. To minimize the amount of generated encoded data, the encoder uses an algorithm which is designed to minimize the number of I-macroblocks of the P-pictures and B-pictures. I-pictures and P-pictures are used as reference pictures, however B-pictures are not so used. Sugahara, Fig. 19.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	FIG. 19 PRIOR ART  Sugahara, 6:14-35. It is an objective of the present invention to overcome the problems of the prior art set out above, by providing a compressed data processing method and compressed data processing apparatus, to be used in conjunction with a conventional type of MPEG encoder and conventional type of MPEG decoder, whereby MPEG-encoded compressed data conveying a stream of pictures can be operated on in a very simple manner to achieve a reduction of the picture updating frequency of that stream of pictures, thereby enabling special effects such as the aforementioned “time lapse” effect to be readily achieved. It is a second objective of the present invention to provide a compressed data recording and

ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	playback method and a compressed data recording and playback apparatus incorporating a conventional type of MPEG encoder and conventional type of MPEG decoder, whereby an amount of recording space available on a recording medium can be increased through further compression of one or more sets of video data which have previously been recorded on the recording medium in the form of MPEG-encoded compressed data, thereby eliminating the need to entirely delete such previously recorded video data sets. Sugahara, 6:65-7:15. The method is designed for application to an MPEG compressed video data stream, i.e., in which each of the reference pictures is an MPEG I-picture or P-picture, and each of the predictively encoded pictures is a P-picture or a B-picture. The method can be implemented such that each of the pictures for which prediction information is replaced is a B-picture, and the copy data set includes motion vector information indicating that an overall amount of picture motion of a B-picture with respect to a corresponding temporally preceding or succeeding reference picture is zero, and motion compensated prediction error information indicating that respective amounts of motion compensated prediction error for all macroblocks of the B-picture are zero. That is to say, all macroblocks of the B-picture are indicated as being skipped macroblocks, so that at the time of decoding the MPEG data stream, that B-picture will be decoded as an identical copy of a corresponding reference picture.
1[a] assigning a skip coding mode to a first segment of a first frame of the sequence;	The below references, as evidence by the example citations, disclose assigning a skip coding mode to a first segment of a first frame of the sequence. *See, e.g.*,

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	The ’808 patent, 4:44-60: In order to illustrate the operation of a generic video coding system in greater detail, reference will now be made to the exemplary video encoder and video decoder illustrated in FIGS. 1 and 2 of the accompanying drawings. The video encoder 100 of FIG. 1 employs a combination of INTRA- and INTER-coding to produce a compressed (encoded) video bit-stream and decoder 200 of FIG. 2 is arranged to receive and decode the video bit-stream produced by encoder 100 in order to produce a reconstructed video sequence. Throughout the following description it will be assumed that the luminance component of a macroblock comprises 16×16 pixels arranged as an array of 4, 8×8 blocks, and that the associated chrominance components are spatially sub-sampled by a factor of two in the horizontal and vertical directions to form 8×8 blocks, as depicted in FIG. 3. Extension of the description to other block sizes and other sub-sampling schemes will be apparent to those of ordinary skill in the art. The ’808 patent, 3:61-8:18 The video encoder 100 comprises an input 101 for receiving a digital video signal from a camera or other video source (not shown). It also comprises a transformation unit 104 which is arranged to perform a block-based discrete cosine transform (DCT), a quantizer 106, an inverse quantizer 108, an inverse transformation unit 110, arranged to perform an inverse block-based discrete cosine transform (IDCT), combiners 112 and 116, and a frame store 120. The encoder further comprises a motion estimator 130, a motion field coder 140 and a motion compensated predictor 150. Switches 102 and 114 are operated co-operatively by control manager 160 to switch the encoder between an INTRA-mode of video encoding and an INTER-mode of video encoding. The encoder 100 also comprises a video multiplex coder 170 which forms a single bit-stream from the various types of information produced by the encoder 100 for further transmission to a remote receiving terminal or, for example, for storage on a mass storage medium, such as a computer hard drive (not shown). Encoder 100 operates as follows. Each frame of uncompressed video provided from the video

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	source to input 101 is received and processed macroblock by macroblock, preferably in raster-scan order. When the encoding of a new video sequence starts, the first frame to be encoded is encoded as an INTRA-coded frame. Subsequently, the encoder is programmed to code each frame in INTER-coded format, unless one of the following conditions is met: 1) it is judged that the current macroblock of the frame being coded is so dissimilar from the pixel values in the reference frame used in its prediction that excessive prediction error information is produced, in which case the current macroblock is coded in INTRA-coded format; 2) a predefined INTRA frame repetition interval has expired; or 3) feedback is received from a receiving terminal indicating a request for a frame to be provided in INTRA-coded format. The occurrence of condition 1) is detected by monitoring the output of the combiner 116. The combiner 116 forms a difference between the current macroblock of the frame being coded and its prediction, produced in the motion compensated prediction block 150. If a measure of this difference (for example a sum of absolute differences of pixel values) exceeds a predetermined threshold, the combiner 116 informs the control manager 160 via a control line 119 and the control manager 160 operates the switches 102 and 114 via control line 113 so as to switch the encoder 100 into INTRA-coding mode. In this way, a frame which is otherwise encoded in INTER-coded format may comprise INTRA-coded macroblocks. Occurrence of condition 2) is monitored by means of a timer or frame counter implemented in the control manager 160, in such a way that if the timer expires, or the frame counter reaches a predetermined number of frames, the control manager 160 operates the switches 102 and 114 via control line 113 to switch the encoder into INTRA-coding mode. Condition 3) is triggered if the control manager 160 receives a feedback signal from, for example, a receiving terminal, via control line 121 indicating that an INTRA frame refresh is required by the receiving terminal. Such a condition may arise, for example, if a previously transmitted frame is badly corrupted by interference during its transmission, rendering it impossible to decode at the receiver. In this situation, the receiving decoder issues a request for the next frame to be encoded in INTRA-coded format, thus re-initialising the coding sequence.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	Operation of the encoder 100 in INTRA-coding mode will now be described. In INTRA-coding mode, the control manager 160 operates the switch 102 to accept video input from input line 118. The video signal input is received macroblock by macroblock from input 101 via the input line 118. As they are received, the blocks of luminance and chrominance values which make up the macroblock are passed to the DCT transformation block 104, which performs a 2-dimensional discrete cosine transform on each block of values, producing a 2-dimensional array of DCT coefficients for each block. DCT transformation block 104 produces an array of coefficient values for each block, the number of coefficient values corresponding to the dimensions of the blocks which make up the macroblock (in this case 8×8). The DCT coefficients for each block are passed to the quantizer 106, where they are quantized using a quantization parameter QP. Selection of the quantization parameter QP is controlled by the control manager 160 via control line 115. The array of quantized DCT coefficients for each block is then passed from the quantizer 106 to the video multiplex coder 170, as indicated by line 125 in FIG. 1. The video multiplex coder 170 orders the quantized transform coefficients for each block using a zigzag scanning procedure, thereby converting the two-dimensional array of quantized transform coefficients into a one-dimensional array. Each non-zero valued quantized coefficient in the one dimensional array is then represented as a pair of values, referred to as level and run, where level is the value of the quantized coefficient and run is the number of consecutive zero-valued coefficients preceding the coefficient in question. The run and level values are further compressed in the video multiplex coder 170 using entropy coding, for example, variable length coding (VLC), or arithmetic coding. Once the run and level values have been entropy coded using an appropriate method, the video multiplex coder 170 further combines them with control information, also entropy coded using a method appropriate for the kind of information in question, to form a single compressed bit-stream of coded image information 135. It should be noted that while entropy coding has been

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	described in connection with operations performed by the video multiplex coder 170, in alternative implementations a separate entropy coding unit may be provided. A locally decoded version of the macroblock is also formed in the encoder 100. This is done by passing the quantized transform coefficients for each block, output by quantizer 106, through inverse quantizer 108 and applying an inverse DCT transform in inverse transformation block 110. In this way a reconstructed array of pixel values is constructed for each block of the macroblock. The resulting decoded image data is input to combiner 112. In INTRA-coding mode, switch 114 is set so that the input to the combiner 112 via switch 114 is zero. In this way, the operation performed by combiner 112 is equivalent to passing the decoded image data unaltered. As subsequent macroblocks of the current frame are received and undergo the previously described encoding and local decoding steps in blocks 104, 106, 108, 110 and 112, a decoded version of the INTRA-coded frame is built up in frame store 120. When the last macroblock of the current frame has been INTRA-coded and subsequently decoded, the frame store 120 contains a completely decoded frame, available for use as a motion prediction reference frame in coding a subsequently received video frame in INTER-coded format. Operation of the encoder 100 in INTER-coding mode will now be described. In INTER-coding mode, the control manager 160 operates switch 102 to receive its input from line 117, which comprises the output of combiner 116. The combiner 116 receives the video input signal macroblock by macroblock from input 101. As combiner 116 receives the blocks of luminance and chrominance values which make up the macroblock, it forms corresponding blocks of prediction error information. The prediction error information represents the difference between the block in question and its prediction, produced in motion compensated prediction block 150. More specifically, the prediction error information for each block of the macroblock comprises a two-dimensional array of values, each of which represents the difference between a pixel value in the block of luminance or chrominance information being coded and a decoded pixel

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	value obtained by forming a motion-compensated prediction for the block, according to the procedure to be described below. Thus, in the exemplary video coding system considered here where each macroblock comprises, for example, an assembly of 8×8 blocks comprising luminance and chrominance values, the prediction error information for each block of the macroblock similarly comprises an 8×8 array of prediction error values. The prediction error information for each block of the macroblock is passed to DCT transformation block 104, which performs a two-dimensional discrete cosine transform on each block of prediction error values to produce a two-dimensional array of DCT transform coefficients for each block. DCT transformation block 104 produces an array of coefficient values for each prediction error block, the number of coefficient values corresponding to the dimensions of the blocks which make up the macroblock (in this case 8×8). The transform coefficients derived from each prediction error block are passed to quantizer 106 where they are quantized using a quantization parameter QP, in a manner analogous to that described above in connection with operation of the encoder in INTRA-coding mode. As before, selection of the quantization parameter QP is controlled by the control manager 160 via control line 115. The quantized DCT coefficients representing the prediction error information for each block of the macroblock are passed from quantizer 106 to video multiplex coder 170, as indicated by line 125 in FIG. 1. As in INTRA-coding mode, the video multiplex coder 170 orders the transform coefficients for each prediction error block using a certain zigzag scanning procedure and then represents each non-zero valued quantized coefficient as a run-level pair. It further compresses the run-level pairs using entropy coding, in a manner analogous to that described above in connection with INTRA-coding mode. Video multiplex coder 170 also receives motion vector information (described in the following) from motion field coding block 140 via line 126 and control information from control manager 160. It entropy codes the motion vector information and control information and forms a single bit-stream of coded image information,

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	135 comprising the entropy coded motion vector, prediction error and control information. The quantized DCT coefficients representing the prediction error information for each block of the macroblock are also passed from quantizer 106 to inverse quantizer 108. Here they are inverse quantized and the resulting blocks of inverse quantized DCT coefficients are applied to inverse DCT transform block 110, where they undergo inverse DCT transformation to produce locally decoded blocks of prediction error values. The locally decoded blocks of prediction error values are then input to combiner 112. In INTER-coding mode, switch 114 is set so that the combiner 112 also receives predicted pixel values for each block of the macroblock, generated by motion-compensated prediction block 150. The combiner 112 combines each of the locally decoded blocks of prediction error values with a corresponding block of predicted pixel values to produce reconstructed image blocks and stores them in frame store 120. As subsequent macroblocks of the video signal are received from the video source and undergo the previously described encoding and decoding steps in blocks 104, 106, 108, 110, 112, a decoded version of the frame is built up in frame store 120. When the last macroblock of the frame has been processed, the frame store 120 contains a completely decoded frame, available for use as a motion prediction reference frame in encoding a subsequently received video frame in INTER-coded format. The details of the motion-compensated prediction performed by video encoder 100 will now be considered. Any frame encoded in INTER-coded format requires a reference frame for motion-compensated prediction. This means, necessarily, that when encoding a video sequence, the first frame to be encoded, whether it is the first frame in the sequence, or some other frame, must be encoded in INTRA-coded format. This, in turn, means that when the video encoder 100 is switched into INTER-coding mode by control manager 160, a complete reference frame, formed by locally decoding a previously encoded frame, is already available in the frame store

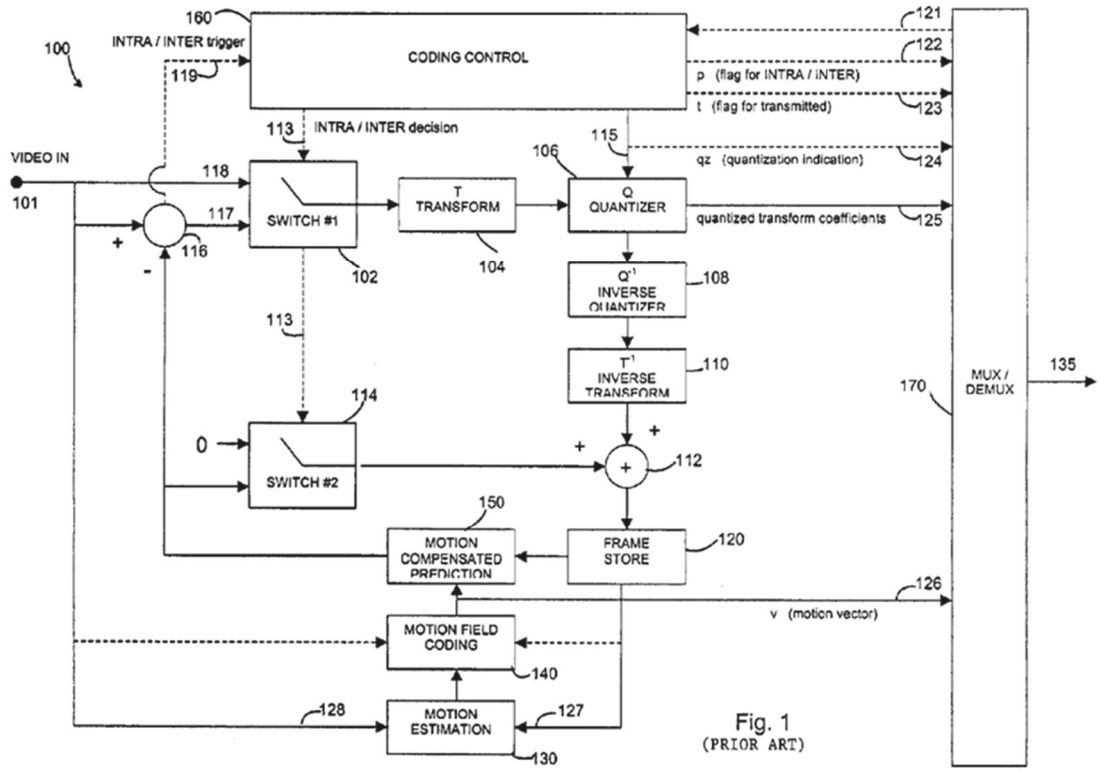
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	120 of the encoder. In general, the reference frame is formed by locally decoding either an INTRA-coded frame or an INTER-coded frame. In the following description it will be assumed that the encoder performs motion compensated prediction on a macroblock basis, i.e. a macroblock is the smallest element of a video frame that can be associated with motion information. It will further be assumed that a prediction for a given macroblock is formed by identifying a region of 16×16 values in the luminance component of the reference frame that shows best correspondence with the 16×16 luminance values of the macroblock in question. Motion-compensated prediction in a video coding system where motion information may be associated with elements smaller than a macroblock will be considered later in the text. The first step in forming a prediction for a macroblock of the current frame is performed by motion estimation block 130. The motion estimation block 130 receives the blocks of luminance and chrominance values which make up the current macroblock of the frame to be coded via line 128. It then performs a block matching operation in order to identify a region in the reference frame that corresponds best with the current macroblock. In order to perform the block matching operation, motion estimation block 130 accesses reference frame data stored in frame store 120 via line 127. More specifically, motion estimation block 130 performs block-matching by calculating difference values (e.g. sums of absolute differences) representing the difference in pixel values between the macroblock under examination and candidate best-matching regions of pixels from a reference frame stored in the frame store 120. A difference value is produced for candidate regions at all possible offsets within a predefined search region of the reference frame and motion estimation block 130 determines the smallest calculated difference value. The candidate region that yields the smallest difference value is selected as the best-matching region. The offset between the current macroblock and the best-matching region identified in the reference frame defines a "motion vector" for the macroblock in question. The motion vector typically comprises a pair of numbers, one describing the horizontal (Δx) between the current macroblock and the best-matching region of the reference

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	frame, the other representing the vertical displacement (Δy). Once the motion estimation block 130 has produced a motion vector for the macroblock, it outputs the motion vector to the motion field coding block 140. The motion field coding block 140 approximates the motion vector received from motion estimation block 130 using a motion model comprising a set of basis functions and motion coefficients. More specifically, the motion field coding block 140 represents the motion vector as a set of motion coefficient values which, when multiplied by the basis functions, form an approximation of the motion vector. Typically, a translational motion model having only two motion coefficients and basis functions is used, but motion models of greater complexity may also be used. The motion coefficients are passed from motion field coding block 140 to motion compensated prediction block 150. Motion compensated prediction block 150 also receives the best-matching region of pixel values identified by motion estimation block 130 from frame store 120. Using the approximate representation of the motion vector generated by motion field coding block 140 and the pixel values of the best-matching region of pixels from the reference frame, motion compensated prediction block 150 generates an array of predicted pixel values for each block of the current macroblock. Each block of predicted pixel values is passed to combiner 116 where the predicted pixel values are subtracted from the actual (input) pixel values in the corresponding block of the current macroblock. In this way a set of prediction error blocks for the macroblock is obtained. The ’808 patent, FIG. 1:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	 Fig. 1 (PRIOR ART) Sugahara, 9:9-13. FIG. 4 is a conceptual diagram for illustrating the effect of applying processing by the first or second apparatus embodiment to the MPEG GOP unit of FIG. 3, for the case in which

ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	prediction data of each of the B-pictures are replaced by an identical copy data set; Sugahara,10:19-35. FIG. 1 is a basic system block diagram of an embodiment of a picture updating frequency conversion apparatus according to the present invention for operating on MPEG-encoded compressed data. The apparatus of FIG. 1 is made up of a picture updating frequency conversion section 21 and a CPU 22. The picture updating frequency conversion section 21 is formed of a stream buffer 23, a picture data detection section 24, a stream portion changeover section 25, a P-picture copy data memory 26 and a B-picture copy data memory 27. The input MPEG-encoded data stream (which will be assumed to be MPEG-1 data) which is supplied to the picture updating frequency conversion section 21 has been originally generated by an MPEG encoder such as that described above referring to FIG. 19, and may for example have been read out from a storage medium such as an optical disk, etc., as a playback compressed data stream. Sugahara, 13:24-43. If the CPU 22 supplies command signals to the picture data detection section 24 designating that copy data replacement processing is to be performed in the first mode, then as successive parts of the MPEG data stream are shifted into the stream buffer 23, the picture data detection section 24 monitors the contents of the stream buffer 23 to detect each occurrence of two successive picture start code patterns, and each occurrence of the picture start code pattern followed by the GOP start code bit pattern, and thereby obtains the start and end positions (stream addresses) of each portion of the MPEG data stream that constitutes the entire data for one picture, i.e. the picture coding type code, picture layer information, slice layer information, macroblock information, etc., described hereinabove, with that data stream portion extending from one occurrence of the picture start code pattern to an immediately succeeding occurrence

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	of that pattern, or from an occurrence of the picture start code pattern up to a subsequent occurrence of the GOP start code pattern. Sugahara, 14:15-35. If the second mode of copy data replacement processing is designated by the CPU 22, i.e., whereby the data of both B-pictures and P-pictures are to be replaced by respective copy data portions as described referring to FIG. 8 hereinabove, then the picture data detection section 24 notifies this to the stream portion changeover section 25 and also extracts from each portion of the MPEG data stream conveying the data of a P-picture the temporal_reference and vbv_delay values for that picture and supplies these to the stream portion changeover section 25. In that case the stream portion changeover section 25 reads out from the P-picture copy data memory 26 a basic P-picture copy stream portion containing prediction information which specifies that a P-picture is to be decoded as a copy of the corresponding reference present invention (i.e., indicates that all macroblocks of the picture are to be decoded as skipped macroblocks) inserts the extracted temporal_reference and vbv_delay values to obtain a complete copy stream portion, and replaces the previous MPEG data stream portion conveying the data of that P-picture with the complete copy stream portion.
1[b] assigning either a zero motion vector or a predicted non-zero motion vector for the skip coding mode for the first segment based at least in part on the motion information of a second segment	The below references, as evidence by the example citations, disclose assigning either a zero motion vector or a predicted non-zero motion vector for the skip coding mode for the first segment based at least in part on the motion information of a second segment neighboring the first segment. *See, e.g.*, The ’808 patent, 4:44-60: In order to illustrate the operation of a generic video coding system in greater detail, reference will now be made to the exemplary video encoder and video decoder illustrated in FIGS. 1 and

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neighboring the first segment; and	2 of the accompanying drawings. The video encoder 100 of FIG. 1 employs a combination of INTRA- and INTER-coding to produce a compressed (encoded) video bit-stream and decoder 200 of FIG. 2 is arranged to receive and decode the video bit-stream produced by encoder 100 in order to produce a reconstructed video sequence. Throughout the following description it will be assumed that the luminance component of a macroblock comprises 16×16 pixels arranged as an array of 4, 8×8 blocks, and that the associated chrominance components are spatially sub-sampled by a factor of two in the horizontal and vertical directions to form 8×8 blocks, as depicted in FIG. 3. Extension of the description to other block sizes and other sub-sampling schemes will be apparent to those of ordinary skill in the art. The ’808 patent, 3:61-4:12 The video encoder 100 comprises an input 101 for receiving a digital video signal from a camera or other video source (not shown). It also comprises a transformation unit 104 which is arranged to perform a block-based discrete cosine transform (DCT), a quantizer 106, an inverse quantizer 108, an inverse transformation unit 110, arranged to perform an inverse block-based discrete cosine transform (IDCT), combiners 112 and 116, and a frame store 120. The encoder further comprises a motion estimator 130, a motion field coder 140 and a motion compensated predictor 150. Switches 102 and 114 are operated co-operatively by control manager 160 to switch the encoder between an INTRA-mode of video encoding and an INTER-mode of video encoding. The encoder 100 also comprises a video multiplex coder 170 which forms a single bit-stream from the various types of information produced by the encoder 100 for further transmission to a remote receiving terminal or, for example, for storage on a mass storage medium, such as a computer hard drive (not shown). The ’808 patent, 7:30-8:18: The first step in forming a prediction for a macroblock of the current frame is performed by motion estimation block 130. The motion estimation block 130 receives the blocks of luminance and chrominance values which make up the current macroblock of the frame to be

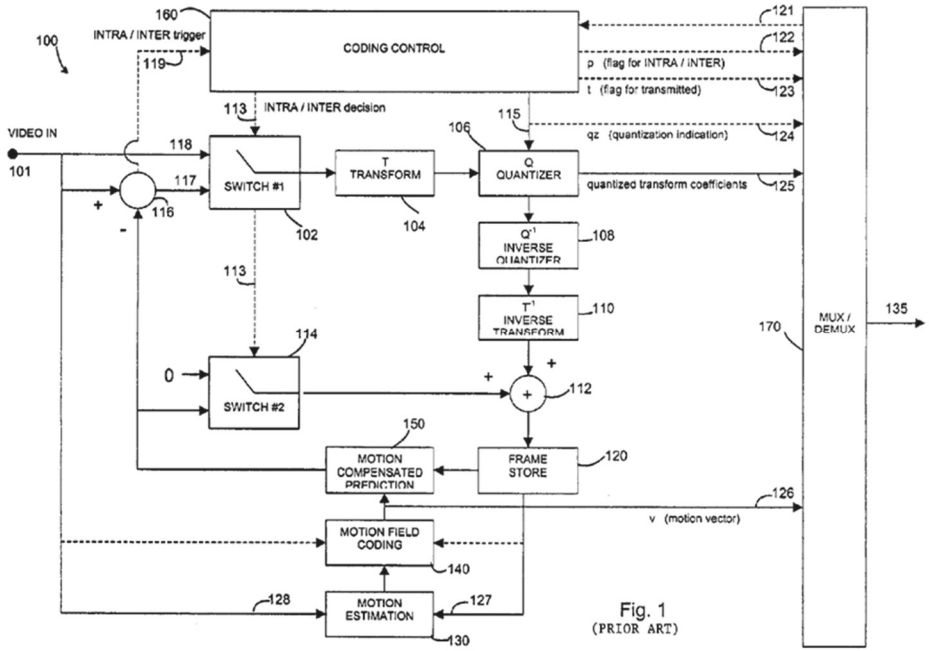
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	coded via line 128. It then performs a block matching operation in order to identify a region in the reference frame that corresponds best with the current macroblock. In order to perform the block matching operation, motion estimation block 130 accesses reference frame data stored in frame store 120 via line 127. More specifically, motion estimation block 130 performs block-matching by calculating difference values (e.g. sums of absolute differences) representing the difference in pixel values between the macroblock under examination and candidate best-matching regions of pixels from a reference frame stored in the frame store 120. A difference value is produced for candidate regions at all possible offsets within a predefined search region of the reference frame and motion estimation block 130 determines the smallest calculated difference value. The candidate region that yields the smallest difference value is selected as the best-matching region. The offset between the current macroblock and the best-matching region identified in the reference frame defines a "motion vector" for the macroblock in question. The motion vector typically comprises a pair of numbers, one describing the horizontal (Δx) between the current macroblock and the best-matching region of the reference frame, the other representing the vertical displacement (Δy). Once the motion estimation block 130 has produced a motion vector for the macroblock, it outputs the motion vector to the motion field coding block 140. The motion field coding block 140 approximates the motion vector received from motion estimation block 130 using a motion model comprising a set of basis functions and motion coefficients. More specifically, the motion field coding block 140 represents the motion vector as a set of motion coefficient values which, when multiplied by the basis functions, form an approximation of the motion vector. Typically, a translational motion model having only two motion coefficients and basis functions is used, but motion models of greater complexity may also be used. The motion coefficients are passed from motion field coding block 140 to motion compensated prediction block 150. Motion compensated prediction block 150 also receives the best-matching region of pixel values identified by motion estimation block 130 from frame store 120. Using the approximate representation of the motion vector generated by motion field

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	coding block 140 and the pixel values of the best-matching region of pixels from the reference frame, motion compensated prediction block 150 generates an array of predicted pixel values for each block of the current macroblock. Each block of predicted pixel values is passed to combiner 116 where the predicted pixel values are subtracted from the actual (input) pixel values in the corresponding block of the current macroblock. In this way a set of prediction error blocks for the macroblock is obtained. The '808 patent, 16:1-14: FIG. 6 is a schematic block diagram of a video encoder 600 implemented according to an embodiment of the invention. When encoding frames of a digital video sequence, encoder 600 operates in a manner similar to that previously described in connection with the prior art video encoder of FIG. 1 to generate INTRA-coded and INTER-coded compressed video frames. The structure of the video encoder shown in FIG. 6 is substantially identical to that of the prior art video encoder shown in FIG. 1, with appropriate modifications to the motion estimation part necessary to implement the video encoding method according to the invention. All parts of the video encoder which implement functions and operate in a manner identical to the previously described prior art video encoder are identified with identical reference numbers. The '808 patent, FIG. 1:

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	 Fig. 1 (PRIOR ART) H.263, § 6.1.1:

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	6.1.1 Differential motion vectors The macroblock vector is obtained by adding predictors to the vector differences indicated by MVD (see Table 11). For differential coding with four vectors per macroblock, refer to Annex F. In case of one vector per macroblock, the candidate predictors for the differential coding are taken from three surrounding macroblocks as indicated in Figure 11. The predictors are calculated separately for the horizontal and vertical components. In the special cases at the borders of the current GOB or picture, the following decision rules are applied in increasing order: 1) When the corresponding macroblock was coded in INTRA mode (if not in PB-frames mode) or was not coded (COD = 1), the candidate predictor is set to zero. 2) The candidate predictor MV1 is set to zero if the corresponding macroblock is outside the picture (at the left side). 3) Then, the candidate predictors MV2 and MV3 are set to MV1 if the corresponding macroblocks are outside the picture (at the top) or outside the GOB (at the top) if the GOB header of the current GOB is non-empty. 4) Then, the candidate predictor MV3 is set to zero if the corresponding macroblock is outside the picture (at the right side). For each component, the predictor is the median value of the three candidate predictors for this component. Advantage is taken of the fact that the range of motion vector component values is constrained. Each VLC word for MVD represents a pair of difference values. Only one of the pair will yield a macroblock vector component falling within the permitted range [–16, 15.5]. A positive value of the horizontal or vertical component of the motion vector signifies that the prediction is formed from pixels in the previous picture which are spatially to the right or below the pixels being predicted. Kuriki, [0005-0006], [0026-0028]: In addition to the above-described series of operations, the encoding apparatus performs an operation of skipping the variable length encoding when the quantization block or the motion vector has the same value as that of the adjacent macroblock or the macroblock at the same

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	position in the previous or subsequent frame, which is referred to as a macroblock skip. Here, a macroblock that is skipped is referred to as a skipped macroblock. More specifically, in the case of a P picture, the encoding device performs the macroblock skip on a macroblock in which the quantization block is 0, that is, all the quantized DCT coefficients in the quantization block are 0 and the motion vector thereof is 0, and In the case of a B picture, the quantization block is 0, and the macroblock skip is performed for a macroblock whose motion vector is the same in magnitude and direction as the motion vector of the left adjacent macroblock of the current macroblock. However, the encoding apparatus sets the start and end of the slice to no macroblock skipping of the located macroblock is performed. … On the other hand, if it is determined in step 23 that the current macroblock is a B picture, the skip determination unit 120 calculates the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock, and determines whether or not the difference is equal to or smaller than the threshold value b (step 26). Here the previous the macro block means a macro block which is an encoding target immediately before the encoding target macro block. In a frame, it is usually a macroblock located on the left side of a macroblock to be encoded. Also, it is assumed that the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is calculated for each of the x component and the y component, and the skip determination unit 120 performs threshold determination for each of the x component and the y component of the difference. That is, the skip determination unit 120 determines whether both the x component and the y component of the difference are equal to or smaller than the threshold value b or whether one or both of the x component and the y component are larger than the threshold value b. It is assumed that the determination in step 26 includes that the direction of prediction (forward prediction, backward prediction, bidirectional prediction, or the like) is the same between the motion vector of the current macroblock and the motion vector of

ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	the immediately preceding macroblock, that is, the reference frame is the same When it is determined in step 26 that both the x component and the y component of the difference are equal to or smaller than the threshold value b, the skip determination unit 120 determines that the macroblock is a skip macroblock (step 25). The skip determination unit 120 notifies the variable length coding unit 110, the motion vector replacement unit 121, and the addition unit 108 that the macroblock is determined to be a skip macroblock. In this way, in the case of a B picture, the skip determination unit 120 determines that the macroblock is a skip macroblock when the macroblock is not the first or last macroblock of the slice, the quantized block is 0, and the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is equal to or less than the threshold value b in both the x component and the y component. In the present embodiment, the threshold value b is 1.0. That is, when the skip determination unit 120 determines that both the x component and the y component of the motion vector difference between the current macroblock and the immediately preceding macroblock are equal to or smaller than 1.0, it determines that the current macroblock is a skip macroblock. If it is 1.0 or less, as in the case of the P picture, even if the coding of the macro block is omitted, the difference between the original image and the reproduced image is hardly noticeable to the human visual sense, so that there is substantially no problem. Note that the threshold value a and the threshold value b are not limited to 0.5 and 1.0, and, for example, the user may be allowed to set arbitrary values in the skip determination unit 120 within a range in which deterioration in image quality is allowable. Sugahara, 2:11-32. With predictive encoding, the motion compensated prediction section 1 successively shifts the input macroblock with respect to the reference picture, within a predetermined search range, to determine whether there is a 16×16 array of pixels within the reference picture which has at

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	least a predetermined minimum degree of correlation with the input macroblock. If such a condition is detected, then the amount and direction of displacement between that 16×16 pixel array in the reference picture and the input macroblock is obtained, as a vector value referred to as a motion vector (specifically, a combination of a horizontal and a vertical motion vector). The respective values of difference between the pixel values (i.e., luminance and chrominance values) of the input macroblock and the correspond pixels within that 16×16 array of pixels in the reference picture (read out from the picture memory 11 and supplied via the motion compensated prediction section 1) are then derived by the adder 2, and supplied to the DCT transform section 3, with these values being referred to as motion compensated prediction error values in the following. Prediction from a preceding reference picture process is referred to as forward prediction, and from a succeeding reference picture is referred to as backward prediction. Sugahara, 7:2-15. The method can be implemented such that each of the pictures for which prediction information is replaced is a B-picture, and the copy data set includes motion vector information indicating that an overall amount of picture motion of a B-picture with respect to a corresponding temporally preceding or succeeding reference picture is zero, and motion compensated prediction error information indicating that respective amounts of motion compensated prediction error for all macroblocks of the B-picture are zero. That is to say, all macroblocks of the B-picture are indicated as being skipped macroblocks, so that at the time of decoding the MPEG data stream, that B-picture will be decoded as an identical copy of a corresponding reference picture. Sugahara, 8:47-56. An apparatus for achieving the third objective set out above can be basically similarly

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	configured, but with the copy data specifying a fixed non-zero size and direction for a motion vector of a predictively encoded picture, and zero amounts of motion compensated prediction error for each of the macroblocks of the picture, and with the apparatus also including means for operating on successive I-pictures such as to produce appropriate amounts of successive displacement of these pictures (with respect to a display screen) when the MPEG data are decoded and displayed. Sugahara, 13:1-8. With a second mode of operation of this embodiment, referring to FIG. 6, in addition to such conversion of each B-picture, each P-picture 32 is also converted by the stream portion changeover section 25 such that all of the macroblocks become skipped macroblocks with forward prediction, i.e., the MPEG data of the P-picture 31 are re-encoded as code which expresses a copy of the preceding reference picture. Sugahara, 17:20-29. For example, if the second mode of processing described above is modified such that each P-picture copy stream portion and B-picture copy stream portion specifies a picture as having a fixed non-zero motion vector in a fixed direction, and all of the P and B-pictures of a GOP are subjected to copy data replacement, then the result will be that the final displayed picture will be successively shifted across the display screen, in the direction of the motion vector, when that GOP is decoded and a resultant video signal generated. Sugahara, 19:15-20. Each time step S10, S12 or S15 has been executed, operation returns to step S5 in which the counter n is incremented, and if n has not reached a value equal to the total number of columns

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	of macroblocks constituting a picture (step S6, N), operation returns to step S2, to then select and process the next picture in the temporal sequence. Sugahara, 21:50-67. wherein said stream is an MPEG compressed video data stream in which each of said reference pictures is an I-picture or a P-picture and each of said predictively encoded pictures is a P-picture or a B-picture, each of said pictures for which prediction information is replaced is a B-picture, and wherein said copy data set includes motion vector information indicating that an overall amount of picture motion of a B-picture with respect to a corresponding temporally preceding reference picture or with respect to a corresponding temporally succeeding reference picture is zero and motion compensated prediction error information indicating that respective amounts of motion compensated prediction error for all macroblocks of said B-picture are zero, to thereby specify all macroblocks of said B-picture as being skipped macroblocks.
1[c] forming a prediction for the first segment with respect to a reference frame based at least in part on the assigned motion vector for the skip coding mode, wherein the assigned motion vector is one of the zero motion vector and the	The below references, as evidence by the example citations, disclose forming a prediction for the first segment with respect to a reference frame based at least in part on the assigned motion vector for the skip coding mode, wherein the assigned motion vector is one of the zero motion vector and the predicted non-zero motion vector. *See, e.g.*, The '808 patent, 4:44-60: In order to illustrate the operation of a generic video coding system in greater detail, reference will now be made to the exemplary video encoder and video decoder illustrated in FIGS. 1 and 2 of the accompanying drawings. The video encoder 100 of FIG. 1 employs a combination of INTRA- and INTER-coding to produce a compressed (encoded) video bit-stream and decoder

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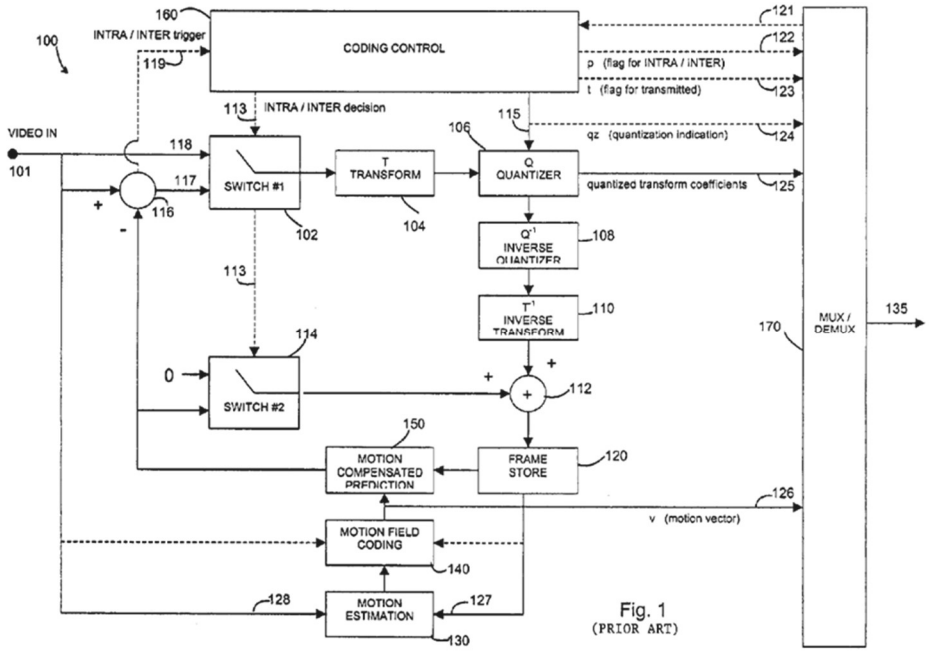
ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
predicted non-zero motion vector; and	200 of FIG. 2 is arranged to receive and decode the video bit-stream produced by encoder 100 in order to produce a reconstructed video sequence. Throughout the following description it will be assumed that the luminance component of a macroblock comprises 16×16 pixels arranged as an array of 4, 8×8 blocks, and that the associated chrominance components are spatially sub-sampled by a factor of two in the horizontal and vertical directions to form 8×8 blocks, as depicted in FIG. 3. Extension of the description to other block sizes and other sub-sampling schemes will be apparent to those of ordinary skill in the art. The ’808 patent, 3:61-4:12 The video encoder 100 comprises an input 101 for receiving a digital video signal from a camera or other video source (not shown). It also comprises a transformation unit 104 which is arranged to perform a block-based discrete cosine transform (DCT), a quantizer 106, an inverse quantizer 108, an inverse transformation unit 110, arranged to perform an inverse block-based discrete cosine transform (IDCT), combiners 112 and 116, and a frame store 120. The encoder further comprises a motion estimator 130, a motion field coder 140 and a motion compensated predictor 150. Switches 102 and 114 are operated co-operatively by control manager 160 to switch the encoder between an INTRA-mode of video encoding and an INTER-mode of video encoding. The encoder 100 also comprises a video multiplex coder 170 which forms a single bit-stream from the various types of information produced by the encoder 100 for further transmission to a remote receiving terminal or, for example, for storage on a mass storage medium, such as a computer hard drive (not shown). The ’808 patent, 7:30-8:18: The first step in forming a prediction for a macroblock of the current frame is performed by motion estimation block 130. The motion estimation block 130 receives the blocks of luminance and chrominance values which make up the current macroblock of the frame to be coded via line 128. It then performs a block matching operation in order to identify a region in the reference frame that corresponds best with the current macroblock. In order to perform the

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	block matching operation, motion estimation block 130 accesses reference frame data stored in frame store 120 via line 127. More specifically, motion estimation block 130 performs block-matching by calculating difference values (e.g. sums of absolute differences) representing the difference in pixel values between the macroblock under examination and candidate best-matching regions of pixels from a reference frame stored in the frame store 120. A difference value is produced for candidate regions at all possible offsets within a predefined search region of the reference frame and motion estimation block 130 determines the smallest calculated difference value. The candidate region that yields the smallest difference value is selected as the best-matching region. The offset between the current macroblock and the best-matching region identified in the reference frame defines a "motion vector" for the macroblock in question. The motion vector typically comprises a pair of numbers, one describing the horizontal (Δx) between the current macroblock and the best-matching region of the reference frame, the other representing the vertical displacement (Δy). Once the motion estimation block 130 has produced a motion vector for the macroblock, it outputs the motion vector to the motion field coding block 140. The motion field coding block 140 approximates the motion vector received from motion estimation block 130 using a motion model comprising a set of basis functions and motion coefficients. More specifically, the motion field coding block 140 represents the motion vector as a set of motion coefficient values which, when multiplied by the basis functions, form an approximation of the motion vector. Typically, a translational motion model having only two motion coefficients and basis functions is used, but motion models of greater complexity may also be used. The motion coefficients are passed from motion field coding block 140 to motion compensated prediction block 150. Motion compensated prediction block 150 also receives the best-matching region of pixel values identified by motion estimation block 130 from frame store 120. Using the approximate representation of the motion vector generated by motion field coding block 140 and the pixel values of the best-matching region of pixels from the reference frame, motion compensated prediction block 150 generates an array of predicted pixel values

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	for each block of the current macroblock. Each block of predicted pixel values is passed to combiner 116 where the predicted pixel values are subtracted from the actual (input) pixel values in the corresponding block of the current macroblock. In this way a set of prediction error blocks for the macroblock is obtained. The ’808 patent, ’808 patent, 16:1-14: FIG. 6 is a schematic block diagram of a video encoder 600 implemented according to an embodiment of the invention. When encoding frames of a digital video sequence, encoder 600 operates in a manner similar to that previously described in connection with the prior art video encoder of FIG. 1 to generate INTRA-coded and INTER-coded compressed video frames. The structure of the video encoder shown in FIG. 6 is substantially identical to that of the prior art video encoder shown in FIG. 1, with appropriate modifications to the motion estimation part necessary to implement the video encoding method according to the invention. All parts of the video encoder which implement functions and operate in a manner identical to the previously described prior art video encoder are identified with identical reference numbers. The ’808 patent, FIG. 1:

ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	 Fig. 1 (PRIOR ART) H.263, § 6.1.1:

ASSERTED CLAIMS	PRIOR ART DISCLOSURES:

6.1.1 Differential motion vectors

The macroblock vector is obtained by adding predictors to the vector differences indicated by MVD (see Table 11). For differential coding with four vectors per macroblock, refer to Annex F. In case of one vector per macroblock, the candidate predictors for the differential coding are taken from three surrounding macroblocks as indicated in Figure 11. The predictors are calculated separately for the horizontal and vertical components.

In the special cases at the borders of the current GOB or picture, the following decision rules are applied in increasing order:

1) When the corresponding macroblock was coded in INTRA mode (if not in PB-frames mode) or was not coded (COD = 1), the candidate predictor is set to zero.
2) The candidate predictor MV1 is set to zero if the corresponding macroblock is outside the picture (at the left side).
3) Then, the candidate predictors MV2 and MV3 are set to MV1 if the corresponding macroblocks are outside the picture (at the top) or outside the GOB (at the top) if the GOB header of the current GOB is non-empty.
4) Then, the candidate predictor MV3 is set to zero if the corresponding macroblock is outside the picture (at the right side).

For each component, the predictor is the median value of the three candidate predictors for this component.

Advantage is taken of the fact that the range of motion vector component values is constrained. Each VLC word for MVD represents a pair of difference values. Only one of the pair will yield a macroblock vector component falling within the permitted range [–16, 15.5]. A positive value of the horizontal or vertical component of the motion vector signifies that the prediction is formed from pixels in the previous picture which are spatially to the right or below the pixels being predicted.

Kuriki, [0002], [0004], [0008]:

[Prior art] An encoding apparatus for compression-encoding moving image data by the MPEG method compresses moving image data by performing inter-frame prediction by motion compensation (hereinafter, referred to as motion compensated prediction). The frame of the past of a frame, or the future (or the both) to which an object block belongs with motion compensation prediction about the block (it is hereafter called an object block) of the coding subject in a video data (hereinafter, referred to as a reference frame), and obtains a difference

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	(hereinafter, referred to as a prediction error) of each pixel between the target block and the reference block, and a motion vector indicating a relative positional relationship between both blocks. Typically, motion compensated prediction is performed on a macroblock basis. … Here, the encoding type will be described. There are three kinds of encoding types, i.e., I picture, P picture, and B picture, and any one of the three kinds of encoding types is determined for each frame, and each frame is encoded by a different encoding method according to the encoding type. In a frame of an I picture, a luminance signal and two color difference signals of a macro block are subjected to DCT, quantization and variable length coding without performing motion compensation prediction. The I-picture frame serves as a reference frame of a frame of another encoding type. A frame of a P picture is motion-compensated and predicted using a frame of a past I picture or P picture as a reference frame, and a prediction error after the motion-compensated prediction is subjected to DCT, quantization, and variable length coding. The frame of the P picture serves as a reference frame of a macroblock of another P picture or B picture. The encoding method of the P picture is called unidirectional prediction. The frame of the B picture is motion-compensated and predicted using the frame of the past or future (or both) I picture or P picture as a reference frame, and the resulting prediction error is subjected to DCT, quantization, and variable length coding. It does not become a reference frame for other frames. The B-picture encoding method is called bidirectional prediction because it is predicted from both the past and future directions …. When a decoding device for decoding moving image data detects that there is a skip macroblock from an address of a macroblock, the decoding device performs: The P picture is decoded by using a block at the same position as the skip macro block in the reference frame of the picture, and the B picture is decoded by using the motion vector of the left adjacent macro

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	block. Lee, 63-64: Thus inter coding can be performed according to one of the following 15 modes of operation: SKIP: The current MB is replaced by the MB at the same spatial location in the previous reconstructed picture. Encoding is performed by skipping the current MB and incrementing the MB address. This mode is designed for areas in the picture where little or no change relative to the previously reconstructed picture is detected. FR-PMV: One motion vector for the current MB is predicted and used as an estimate. Motion vector searching is not performed. As only motion compensation is required, the MB is encoded using the header and the motion vector bits. When motion vectors can be accurately predicted, this mode becomes a likely candidate. H.263, § 6.1.1:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:

6.1.1 Differential motion vectors

The macroblock vector is obtained by adding predictors to the vector differences indicated by MVD (see Table 11). For differential coding with four vectors per macroblock, refer to Annex F. In case of one vector per macroblock, the candidate predictors for the differential coding are taken from three surrounding macroblocks as indicated in Figure 11. The predictors are calculated separately for the horizontal and vertical components.

In the special cases at the borders of the current GOB or picture, the following decision rules are applied in increasing order:

1) When the corresponding macroblock was coded in INTRA mode (if not in PB-frames mode) or was not coded (COD = 1), the candidate predictor is set to zero.
2) The candidate predictor MV1 is set to zero if the corresponding macroblock is outside the picture (at the left side).
3) Then, the candidate predictors MV2 and MV3 are set to MV1 if the corresponding macroblocks are outside the picture (at the top) or outside the GOB (at the top) if the GOB header of the current GOB is non-empty.
4) Then, the candidate predictor MV3 is set to zero if the corresponding macroblock is outside the picture (at the right side).

For each component, the predictor is the median value of the three candidate predictors for this component.

Advantage is taken of the fact that the range of motion vector component values is constrained. Each VLC word for MVD represents a pair of difference values. Only one of the pair will yield a macroblock vector component falling within the permitted range [–16, 15.5]. A positive value of the horizontal or vertical component of the motion vector signifies that the prediction is formed from pixels in the previous picture which are spatially to the right or below the pixels being predicted.

Kuriki, [0005-0006], [0026-0028]:

> In addition to the above-described series of operations, the encoding apparatus performs an operation of skipping the variable length encoding when the quantization block or the motion vector has the same value as that of the adjacent macroblock or the macroblock at the same position in the previous or subsequent frame, which is referred to as a macroblock skip. Here, a

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	macroblock that is skipped is referred to as a skipped macroblock. More specifically, in the case of a P picture, the encoding device performs the macroblock skip on a macroblock in which the quantization block is 0, that is, all the quantized DCT coefficients in the quantization block are 0 and the motion vector thereof is 0, and In the case of a B picture, the quantization block is 0, and the macroblock skip is performed for a macroblock whose motion vector is the same in magnitude and direction as the motion vector of the left adjacent macroblock of the current macroblock. However, the encoding apparatus sets the start and end of the slice to no macroblock skipping of the located macroblock is performed. … On the other hand, if it is determined in step 23 that the current macroblock is a B picture, the skip determination unit 120 calculates the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock, and determines whether or not the difference is equal to or smaller than the threshold value b (step 26). Here the previous the macro block means a macro block which is an encoding target immediately before the encoding target macro block. In a frame, it is usually a macroblock located on the left side of a macroblock to be encoded. Also, it is assumed that the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is calculated for each of the x component and the y component, and the skip determination unit 120 performs threshold determination for each of the x component and the y component of the difference. That is, the skip determination unit 120 determines whether both the x component and the y component of the difference are equal to or smaller than the threshold value b or whether one or both of the x component and the y component are larger than the threshold value b. It is assumed that the determination in step 26 includes that the direction of prediction (forward prediction, backward prediction, bidirectional prediction, or the like) is the same between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock, that is, the reference frame is the same

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	When it is determined in step 26 that both the x component and the y component of the difference are equal to or smaller than the threshold value b, the skip determination unit 120 determines that the macroblock is a skip macroblock (step 25). The skip determination unit 120 notifies the variable length coding unit 110, the motion vector replacement unit 121, and the addition unit 108 that the macroblock is determined to be a skip macroblock. In this way, in the case of a B picture, the skip determination unit 120 determines that the macroblock is a skip macroblock when the macroblock is not the first or last macroblock of the slice, the quantized block is 0, and the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is equal to or less than the threshold value b in both the x component and the y component. In the present embodiment, the threshold value b is 1.0. That is, when the skip determination unit 120 determines that both the x component and the y component of the motion vector difference between the current macroblock and the immediately preceding macroblock are equal to or smaller than 1.0, it determines that the current macroblock is a skip macroblock. If it is 1.0 or less, as in the case of the P picture, even if the coding of the macro block is omitted, the difference between the original image and the reproduced image is hardly noticeable to the human visual sense, so that there is substantially no problem. Note that the threshold value a and the threshold value b are not limited to 0.5 and 1.0, and, for example, the user may be allowed to set arbitrary values in the skip determination unit 120 within a range in which deterioration in image quality is allowable. Sugahara, 8:47-56. An apparatus for achieving the third objective set out above can be basically similarly configured, but with the copy data specifying a fixed non-zero size and direction for a motion vector of a predictively encoded picture, and zero amounts of motion compensated prediction error for each of the macroblocks of the picture, and with the apparatus also including means

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	for operating on successive I-pictures such as to produce appropriate amounts of successive displacement of these pictures (with respect to a display screen) when the MPEG data are decoded and displayed. Sugahara, 13:1-8. With a second mode of operation of this embodiment, referring to FIG. 6, in addition to such conversion of each B-picture, each P-picture 32 is also converted by the stream portion changeover section 25 such that all of the macroblocks become skipped macroblocks with forward prediction, i.e., the MPEG data of the P-picture 31 are re-encoded as code which expresses a copy of the preceding reference picture. Sugahara, 17:14-29. The use of copy stream portions for replacement of prediction pictures of an MPEG data stream to produce special effects in a very simple manner is not limited only to the conversion of prediction pictures (B-pictures, or B-pictures and P-pictures) to direct copies of the corresponding reference pictures, as achieved with the embodiments of the invention described above. For example, if the second mode of processing described above is modified such that each P-picture copy stream portion and B-picture copy stream portion specifies a picture as having a fixed non-zero motion vector in a fixed direction, and all of the P and B-pictures of a GOP are subjected to copy data replacement, then the result will be that the final displayed picture will be successively shifted across the display screen, in the direction of the motion vector, when that GOP is decoded and a resultant video signal generated. Sugahara, 21:50-67. wherein said stream is an MPEG compressed video data stream in which each of said reference

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	pictures is an I-picture or a P-picture and each of said predictively encoded pictures is a P-picture or a B-picture, each of said pictures for which prediction information is replaced is a B-picture, and wherein said copy data set includes motion vector information indicating that an overall amount of picture motion of a B-picture with respect to a corresponding temporally preceding reference picture or with respect to a corresponding temporally succeeding reference picture is zero and motion compensated prediction error information indicating that respective amounts of motion compensated prediction error for all macroblocks of said B-picture are zero, to thereby specify all macroblocks of said B-picture as being skipped macroblocks.
1[d] providing in an encoded bitstream an indication of the skip coding mode, wherein no further motion vector information for the first segment is coded in the encoded bitstream.	The below references, as evidence by the example citations, disclose providing in an encoded bitstream an indication of the skip coding mode, wherein no further motion vector information for the first segment is coded in the encoded bitstream. *See, e.g.*, The '808 patent, 4:44-60: In order to illustrate the operation of a generic video coding system in greater detail, reference will now be made to the exemplary video encoder and video decoder illustrated in FIGS. 1 and 2 of the accompanying drawings. The video encoder 100 of FIG. 1 employs a combination of INTRA- and INTER-coding to produce a compressed (encoded) video bit-stream and decoder 200 of FIG. 2 is arranged to receive and decode the video bit-stream produced by encoder 100 in order to produce a reconstructed video sequence. Throughout the following description it will be assumed that the luminance component of a macroblock comprises 16×16 pixels arranged as an array of 4, 8×8 blocks, and that the associated chrominance components are spatially sub-sampled by a factor of two in the horizontal and vertical directions to form 8×8 blocks, as depicted in FIG. 3. Extension of the description to other block sizes and other sub-

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	sampling schemes will be apparent to those of ordinary skill in the art. The '808 patent, 3:61-8:18 The video encoder 100 comprises an input 101 for receiving a digital video signal from a camera or other video source (not shown). It also comprises a transformation unit 104 which is arranged to perform a block-based discrete cosine transform (DCT), a quantizer 106, an inverse quantizer 108, an inverse transformation unit 110, arranged to perform an inverse block-based discrete cosine transform (IDCT), combiners 112 and 116, and a frame store 120. The encoder further comprises a motion estimator 130, a motion field coder 140 and a motion compensated predictor 150. Switches 102 and 114 are operated co-operatively by control manager 160 to switch the encoder between an INTRA-mode of video encoding and an INTER-mode of video encoding. The encoder 100 also comprises a video multiplex coder 170 which forms a single bit-stream from the various types of information produced by the encoder 100 for further transmission to a remote receiving terminal or, for example, for storage on a mass storage medium, such as a computer hard drive (not shown). Encoder 100 operates as follows. Each frame of uncompressed video provided from the video source to input 101 is received and processed macroblock by macroblock, preferably in raster-scan order. When the encoding of a new video sequence starts, the first frame to be encoded is encoded as an INTRA-coded frame. Subsequently, the encoder is programmed to code each frame in INTER-coded format, unless one of the following conditions is met: 1) it is judged that the current macroblock of the frame being coded is so dissimilar from the pixel values in the reference frame used in its prediction that excessive prediction error information is produced, in which case the current macroblock is coded in INTRA-coded format; 2) a predefined INTRA frame repetition interval has expired; or 3) feedback is received from a receiving terminal indicating a request for a frame to be provided in INTRA-coded format. The occurrence of condition 1) is detected by monitoring the output of the combiner 116. The

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	combiner 116 forms a difference between the current macroblock of the frame being coded and its prediction, produced in the motion compensated prediction block 150. If a measure of this difference (for example a sum of absolute differences of pixel values) exceeds a predetermined threshold, the combiner 116 informs the control manager 160 via a control line 119 and the control manager 160 operates the switches 102 and 114 via control line 113 so as to switch the encoder 100 into INTRA-coding mode. In this way, a frame which is otherwise encoded in INTER-coded format may comprise INTRA-coded macroblocks. Occurrence of condition 2) is monitored by means of a timer or frame counter implemented in the control manager 160, in such a way that if the timer expires, or the frame counter reaches a predetermined number of frames, the control manager 160 operates the switches 102 and 114 via control line 113 to switch the encoder into INTRA-coding mode. Condition 3) is triggered if the control manager 160 receives a feedback signal from, for example, a receiving terminal, via control line 121 indicating that an INTRA frame refresh is required by the receiving terminal. Such a condition may arise, for example, if a previously transmitted frame is badly corrupted by interference during its transmission, rendering it impossible to decode at the receiver. In this situation, the receiving decoder issues a request for the next frame to be encoded in INTRA-coded format, thus re-initialising the coding sequence. Operation of the encoder 100 in INTRA-coding mode will now be described. In INTRA-coding mode, the control manager 160 operates the switch 102 to accept video input from input line 118. The video signal input is received macroblock by macroblock from input 101 via the input line 118. As they are received, the blocks of luminance and chrominance values which make up the macroblock are passed to the DCT transformation block 104, which performs a 2-dimensional discrete cosine transform on each block of values, producing a 2-dimensional array of DCT coefficients for each block. DCT transformation block 104 produces an array of coefficient values for each block, the number of coefficient values corresponding to the dimensions of the blocks which make up the macroblock (in this case 8×8). The DCT coefficients for each block are passed to the quantizer 106, where they are quantized using a

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	quantization parameter QP. Selection of the quantization parameter QP is controlled by the control manager 160 via control line 115. The array of quantized DCT coefficients for each block is then passed from the quantizer 106 to the video multiplex coder 170, as indicated by line 125 in FIG. 1. The video multiplex coder 170 orders the quantized transform coefficients for each block using a zigzag scanning procedure, thereby converting the two-dimensional array of quantized transform coefficients into a one-dimensional array. Each non-zero valued quantized coefficient in the one dimensional array is then represented as a pair of values, referred to as level and run, where level is the value of the quantized coefficient and run is the number of consecutive zero-valued coefficients preceding the coefficient in question. The run and level values are further compressed in the video multiplex coder 170 using entropy coding, for example, variable length coding (VLC), or arithmetic coding. Once the run and level values have been entropy coded using an appropriate method, the video multiplex coder 170 further combines them with control information, also entropy coded using a method appropriate for the kind of information in question, to form a single compressed bit-stream of coded image information 135. It should be noted that while entropy coding has been described in connection with operations performed by the video multiplex coder 170, in alternative implementations a separate entropy coding unit may be provided. A locally decoded version of the macroblock is also formed in the encoder 100. This is done by passing the quantized transform coefficients for each block, output by quantizer 106, through inverse quantizer 108 and applying an inverse DCT transform in inverse transformation block 110. In this way a reconstructed array of pixel values is constructed for each block of the macroblock. The resulting decoded image data is input to combiner 112. In INTRA-coding mode, switch 114 is set so that the input to the combiner 112 via switch 114 is zero. In this way, the operation performed by combiner 112 is equivalent to passing the decoded image data

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	unaltered. As subsequent macroblocks of the current frame are received and undergo the previously described encoding and local decoding steps in blocks 104, 106, 108, 110 and 112, a decoded version of the INTRA-coded frame is built up in frame store 120. When the last macroblock of the current frame has been INTRA-coded and subsequently decoded, the frame store 120 contains a completely decoded frame, available for use as a motion prediction reference frame in coding a subsequently received video frame in INTER-coded format. Operation of the encoder 100 in INTER-coding mode will now be described. In INTER-coding mode, the control manager 160 operates switch 102 to receive its input from line 117, which comprises the output of combiner 116. The combiner 116 receives the video input signal macroblock by macroblock from input 101. As combiner 116 receives the blocks of luminance and chrominance values which make up the macroblock, it forms corresponding blocks of prediction error information. The prediction error information represents the difference between the block in question and its prediction, produced in motion compensated prediction block 150. More specifically, the prediction error information for each block of the macroblock comprises a two-dimensional array of values, each of which represents the difference between a pixel value in the block of luminance or chrominance information being coded and a decoded pixel value obtained by forming a motion-compensated prediction for the block, according to the procedure to be described below. Thus, in the exemplary video coding system considered here where each macroblock comprises, for example, an assembly of 8×8 blocks comprising luminance and chrominance values, the prediction error information for each block of the macroblock similarly comprises an 8×8 array of prediction error values. The prediction error information for each block of the macroblock is passed to DCT transformation block 104, which performs a two-dimensional discrete cosine transform on each block of prediction error values to produce a two-dimensional array of DCT transform coefficients for each block. DCT transformation block 104 produces an array of coefficient

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	values for each prediction error block, the number of coefficient values corresponding to the dimensions of the blocks which make up the macroblock (in this case 8×8). The transform coefficients derived from each prediction error block are passed to quantizer 106 where they are quantized using a quantization parameter QP, in a manner analogous to that described above in connection with operation of the encoder in INTRA-coding mode. As before, selection of the quantization parameter QP is controlled by the control manager 160 via control line 115. The quantized DCT coefficients representing the prediction error information for each block of the macroblock are passed from quantizer 106 to video multiplex coder 170, as indicated by line 125 in FIG. 1. As in INTRA-coding mode, the video multiplex coder 170 orders the transform coefficients for each prediction error block using a certain zigzag scanning procedure and then represents each non-zero valued quantized coefficient as a run-level pair. It further compresses the run-level pairs using entropy coding, in a manner analogous to that described above in connection with INTRA-coding mode. Video multiplex coder 170 also receives motion vector information (described in the following) from motion field coding block 140 via line 126 and control information from control manager 160. It entropy codes the motion vector information and control information and forms a single bit-stream of coded image information, 135 comprising the entropy coded motion vector, prediction error and control information. The quantized DCT coefficients representing the prediction error information for each block of the macroblock are also passed from quantizer 106 to inverse quantizer 108. Here they are inverse quantized and the resulting blocks of inverse quantized DCT coefficients are applied to inverse DCT transform block 110, where they undergo inverse DCT transformation to produce locally decoded blocks of prediction error values. The locally decoded blocks of prediction error values are then input to combiner 112. In INTER-coding mode, switch 114 is set so that the combiner 112 also receives predicted pixel values for each block of the macroblock, generated by motion-compensated prediction block 150. The combiner 112 combines each of the locally decoded blocks of prediction error values with a corresponding block of predicted

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	pixel values to produce reconstructed image blocks and stores them in frame store 120. As subsequent macroblocks of the video signal are received from the video source and undergo the previously described encoding and decoding steps in blocks 104, 106, 108, 110, 112, a decoded version of the frame is built up in frame store 120. When the last macroblock of the frame has been processed, the frame store 120 contains a completely decoded frame, available for use as a motion prediction reference frame in encoding a subsequently received video frame in INTER-coded format. The details of the motion-compensated prediction performed by video encoder 100 will now be considered. Any frame encoded in INTER-coded format requires a reference frame for motion-compensated prediction. This means, necessarily, that when encoding a video sequence, the first frame to be encoded, whether it is the first frame in the sequence, or some other frame, must be encoded in INTRA-coded format. This, in turn, means that when the video encoder 100 is switched into INTER-coding mode by control manager 160, a complete reference frame, formed by locally decoding a previously encoded frame, is already available in the frame store 120 of the encoder. In general, the reference frame is formed by locally decoding either an INTRA-coded frame or an INTER-coded frame. In the following description it will be assumed that the encoder performs motion compensated prediction on a macroblock basis, i.e. a macroblock is the smallest element of a video frame that can be associated with motion information. It will further be assumed that a prediction for a given macroblock is formed by identifying a region of 16×16 values in the luminance component of the reference frame that shows best correspondence with the 16×16 luminance values of the macroblock in question. Motion-compensated prediction in a video coding system where motion information may be associated with elements smaller than a macroblock will be considered later in the text.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	The first step in forming a prediction for a macroblock of the current frame is performed by motion estimation block 130. The motion estimation block 130 receives the blocks of luminance and chrominance values which make up the current macroblock of the frame to be coded via line 128. It then performs a block matching operation in order to identify a region in the reference frame that corresponds best with the current macroblock. In order to perform the block matching operation, motion estimation block 130 accesses reference frame data stored in frame store 120 via line 127. More specifically, motion estimation block 130 performs block-matching by calculating difference values (e.g. sums of absolute differences) representing the difference in pixel values between the macroblock under examination and candidate best-matching regions of pixels from a reference frame stored in the frame store 120. A difference value is produced for candidate regions at all possible offsets within a predefined search region of the reference frame and motion estimation block 130 determines the smallest calculated difference value. The candidate region that yields the smallest difference value is selected as the best-matching region. The offset between the current macroblock and the best-matching region identified in the reference frame defines a "motion vector" for the macroblock in question. The motion vector typically comprises a pair of numbers, one describing the horizontal (Δx) between the current macroblock and the best-matching region of the reference frame, the other representing the vertical displacement (Δy). Once the motion estimation block 130 has produced a motion vector for the macroblock, it outputs the motion vector to the motion field coding block 140. The motion field coding block 140 approximates the motion vector received from motion estimation block 130 using a motion model comprising a set of basis functions and motion coefficients. More specifically, the motion field coding block 140 represents the motion vector as a set of motion coefficient values which, when multiplied by the basis functions, form an approximation of the motion vector. Typically, a translational motion model having only two motion coefficients and basis functions is used, but motion models of greater complexity may also be used.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	The motion coefficients are passed from motion field coding block 140 to motion compensated prediction block 150. Motion compensated prediction block 150 also receives the best-matching region of pixel values identified by motion estimation block 130 from frame store 120. Using the approximate representation of the motion vector generated by motion field coding block 140 and the pixel values of the best-matching region of pixels from the reference frame, motion compensated prediction block 150 generates an array of predicted pixel values for each block of the current macroblock. Each block of predicted pixel values is passed to combiner 116 where the predicted pixel values are subtracted from the actual (input) pixel values in the corresponding block of the current macroblock. In this way a set of prediction error blocks for the macroblock is obtained. The '808 patent, FIG. 1:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:

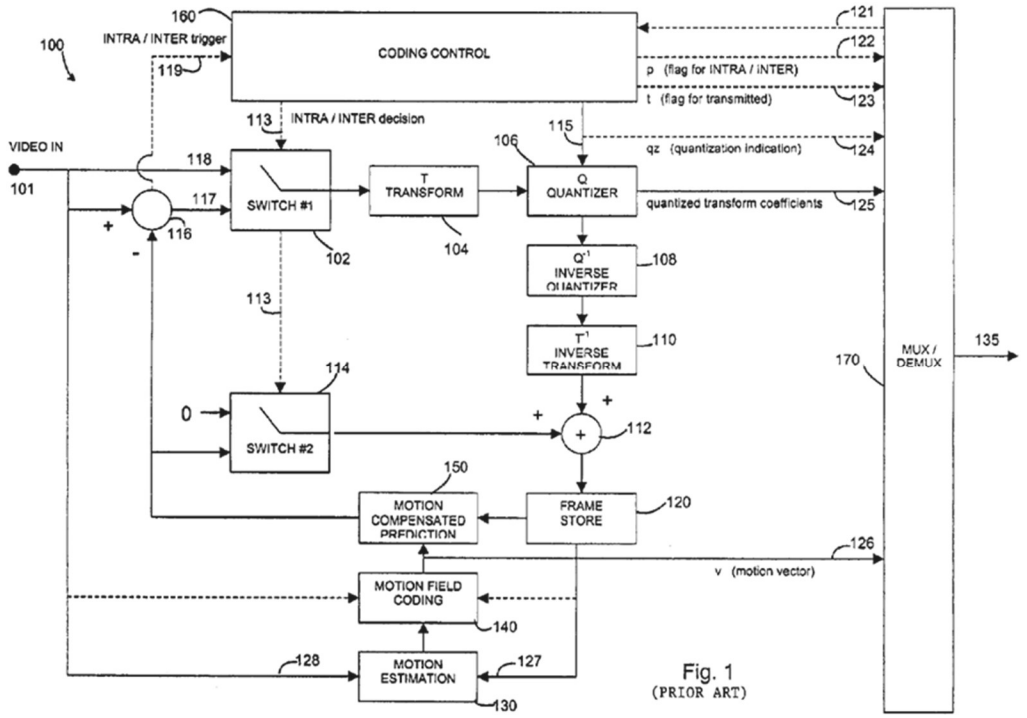


Fig. 1
(PRIOR ART)

H.263, § 5.3.1:

> A bit which when set to "0" signals that the macroblock is coded. If set to "1", no further information is transmitted for this macroblock; in that case the decoder shall treat the macroblock as an INTER macroblock with motion vector for the whole block equal to zero and with no coefficient data. COD is only present in pictures that are not of type "INTRA", for each

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	macroblock in these pictures. NOTE – In Advanced Prediction mode (see Annex F), overlapped block motion compensation is also performed if COD is set to "1"; and in Deblocking Filter mode (see Annex J), the deblocking filter can also affect the values of some pixels of macroblocks having COD is set to "1". Sugahara, 5:9-23. However if a macroblock has been judged to be identical to the correspondingly positioned macroblock of a reference picture at the time of encoding, then no information is actually encoded for that macroblock, which is referred to as a skipped macroblock. Specifically, a macroblock is indicated as being "skipped", in the MPEG data, by omitting to specify an incremental address value (or any other information) for that macroblock. As a result, referring to the decoder example of FIG. 20, at the time when decoding of such a skipped macroblock is executed, the chrominance and luminance values for the correspondingly positioned macroblock of the reference picture will be read out from the picture memory 20 and transferred unchanged via the motion compensated prediction section 18 and the adder 19 to the output of the decoder. Sugahara, 7:2-15. The method can be implemented such that each of the pictures for which prediction information is replaced is a B-picture, and the copy data set includes motion vector information indicating that an overall amount of picture motion of a B-picture with respect to a corresponding temporally preceding or succeeding reference picture is zero, and motion compensated prediction error information indicating that respective amounts of motion compensated prediction error for all macroblocks of the B-picture are zero. That is to say, all macroblocks of the B-picture are indicated as being skipped macroblocks, so that at the time of decoding the MPEG data stream, that B-picture will be decoded as an identical copy of a corresponding

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	reference picture. Sugahara, 13:22-43. The overall operation of the embodiment of FIG. 1 is as follows, with the case of the first mode of operation (replacement of B-picture data only) being described first. If the CPU 22 supplies command signals to the picture data detection section 24 designating that copy data replacement processing is to be performed in the first mode, then as successive parts of the MPEG data stream are shifted into the stream buffer 23, the picture data detection section 24 monitors the contents of the stream buffer 23 to detect each occurrence of two successive picture start code patterns, and each occurrence of the picture start code pattern followed by the GOP start code bit pattern, and thereby obtains the start and end positions (stream addresses) of each portion of the MPEG data stream that constitutes the entire data for one picture, i.e. the picture coding type code, picture layer information, slice layer information, macroblock information, etc., described hereinabove, with that data stream portion extending from one occurrence of the picture start code pattern to an immediately succeeding occurrence of that pattern, or from an occurrence of the picture start code pattern up to a subsequent occurrence of the GOP start code pattern. Sugahara, 14:15-35. If the second mode of copy data replacement processing is designated by the CPU 22, i.e., whereby the data of both B-pictures and P-pictures are to be replaced by respective copy data portions as described referring to FIG. 8 hereinabove, then the picture data detection section 24 notifies this to the stream portion changeover section 25 and also extracts from each portion of the MPEG data stream conveying the data of a P-picture the temporal_reference and vbv_delay values for that picture and supplies these to the stream portion changeover section 25. In that case the stream portion changeover section 25 reads out from the P-picture copy data memory

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	26 a basic P-picture copy stream portion containing prediction information which specifies that a P-picture is to be decoded as a copy of the corresponding reference present invention (i.e., indicates that all macroblocks of the picture are to be decoded as skipped macroblocks) inserts the extracted temporal_reference and vbv_delay values to obtain a complete copy stream portion, and replaces the previous MPEG data stream portion conveying the data of that P-picture with the complete copy stream portion.
2. A method according to claim 1, wherein the second segment is a previously encoded segment neighboring the first segment.	The below references, as evidence by the example citations, disclose that the second segment is a previously encoded segment neighboring the first segment. *See, e.g.*, Hwang, 3:25-35: A current frame and a previous frame (in other words, a search frame and a reference frame) of a video signal are inputted to a motion vector detection block 100 and a full search block 200. At the motion vector detection block 100, to find a motion vector of a search block, i.e., a block currently being processed, motion vectors of processed neighboring blocks of the search block together with a 0 vector are examined to select a candidate motion vector, wherein processed blocks refers to blocks whose motion vectors are determined and the processed neighboring blocks are processed blocks neighboring the search block. Hwang, 3:36-56: The processed neighboring blocks whose motion vectors are utilized in detecting the motion vector of the search block B(i,j) are exemplified in FIG. 4. As shown in FIG. 4, the search frame consists of a multiplicity of slices, each of which includes a number of blocks, the number of slices and the number of blocks in each slice being N2 and N1, respectively. The search frame are processed from the upper left corner to the lower right corner. Therefore,

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	among 8 neighboring blocks surrounding the search block B(i,j), motion vectors of 4 neighboring blocks, i.e., an upper left block B(i-1, j-1), an upper middle block B(i,j-1), an upper right block B(i+1,j-1), and a middle left block B(i-1,j), are known when the search block is processed, wherein j represents a slice number and i designates a location of a block in a slice, i and j being positive integers not larger than N1 and N2, respectively. It can be easily known that, if a search block is not located on the boundary of a frame, the number of processed neighboring blocks is 4. In case the search block is on the boundary as in the case of B(1,1), B(1,2) and so on, the number of processed neighboring blocks may be less than 4. Hwang, 3:57-4:12: After the candidate motion vector is determined, a distortion between the search block and a predicted block corresponding to the candidate motion vector is compared with a predetermined threshold, wherein a predicted block corresponding to a vector is determined as a block of the reference frame which is displaced from the search block by the vector. If the distortion between the search block and the predicted block corresponding to the candidate motion vector is smaller than the threshold, the candidate motion vector is decided as a motion vector of the search block and provided on a line L300 through the full search block 200. Otherwise, a full search trigger signal is applied to the full search block 200 which detects a motion vector of the search block by using a full search block matching method in response to the full search trigger signal. The full search block 200 provides either the motion vector provided from the motion vector detection block 100 or the motion vector determined therein. The motion vector provided from the full search block 200 is fed back to the motion vector detection block 100, to be used in detecting motion vectors of subsequent blocks, e.g., B(i+1,j), of the current frame. Hwang, 4:33-50: Referring to FIG. 2, there is provided a detailed block diagram of the motion vector detection

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	block 100 shown in FIG. 1. The motion vectors of the processed blocks are fed to a motion vector memory 110, to be stored therein. Among them, neighboring vectors which refer to motion vectors of the processed neighboring blocks are selected and coupled to a candidate vector deciding block 120. Referring again to FIG. 4, when the search block B(i,j) is being processed, at least motion vectors of the blocks B(i-1, j-1) to B(N1, j-1) and B(1,j) to B(i-1,j) should be stored at the motion vector memory 110. (Note that B(i, j-1) to B(N1, j-1) are necessary in determining motion vector of remaining blocks, i.e., B(i+1, j) to B(N1, j) included in a jth slice; and B(1, j) to B(i-1, j) are used in determining motion vectors of blocks included in a (j+1)st slice.) Therefore, the motion vector memory 110 should at least have (N1+1) memory spaces each of which can accommodate a motion vector of a processed block. Hwang, 5:11-27: Referring to FIG. 4, in case the number of processed neighboring blocks is 1, (for example, a search block B(2,1)) the motion vector of the processed neighboring block (B(1,1)) may be decided as both of the X and the Y vectors. At the error detection block 130, a distortion between the search block and each of three predicted blocks corresponding to the three candidate vectors inputted thereto is determined, wherein the distortion is a value which represents a difference between two blocks. Of the three candidate vectors, one with a minimum distortion is selected as the candidate motion vector. If the minimum distortion of the candidate motion vector is smaller than the threshold TH, the candidate motion vector is determined as the final motion vector of the search block. Accordingly, a procedure for detecting a motion vector of the search block is completed and the motion vector is provided on L300 through the full search block 200.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	Hwang, Figs. 1-4:

FIG. 1

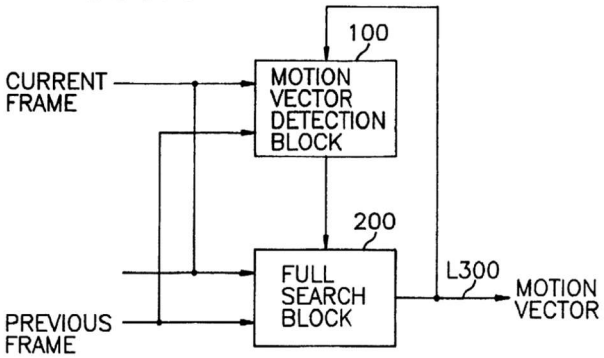
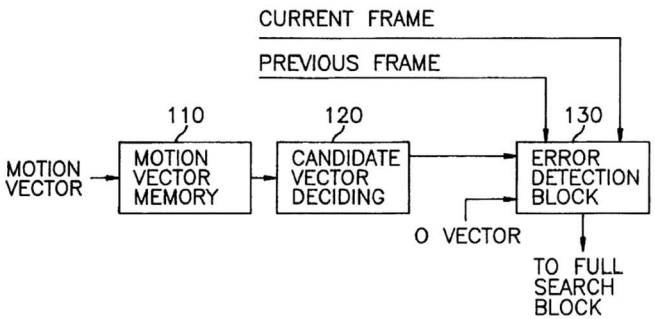


FIG. 2



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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:

FIG. 3

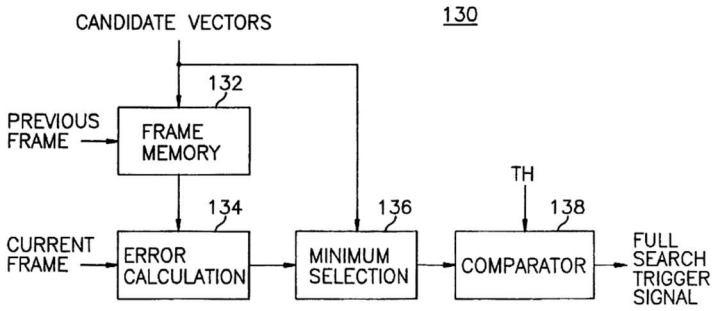
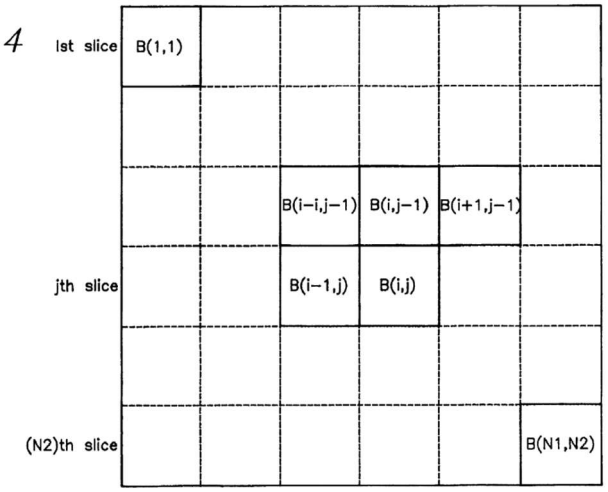


FIG. 4



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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	H.263, § 6.1.1: **6.1.1 Differential motion vectors** The macroblock vector is obtained by adding predictors to the vector differences indicated by MVD (see Table 11). For differential coding with four vectors per macroblock, refer to Annex F. In case of one vector per macroblock, the candidate predictors for the differential coding are taken from three surrounding macroblocks as indicated in Figure 11. The predictors are calculated separately for the horizontal and vertical components. In the special cases at the borders of the current GOB or picture, the following decision rules are applied in increasing order: 1) When the corresponding macroblock was coded in INTRA mode (if not in PB-frames mode) or was not coded (COD = 1), the candidate predictor is set to zero. 2) The candidate predictor MV1 is set to zero if the corresponding macroblock is outside the picture (at the left side). 3) Then, the candidate predictors MV2 and MV3 are set to MV1 if the corresponding macroblocks are outside the picture (at the top) or outside the GOB (at the top) if the GOB header of the current GOB is non-empty. 4) Then, the candidate predictor MV3 is set to zero if the corresponding macroblock is outside the picture (at the right side). For each component, the predictor is the median value of the three candidate predictors for this component. Advantage is taken of the fact that the range of motion vector component values is constrained. Each VLC word for MVD represents a pair of difference values. Only one of the pair will yield a macroblock vector component falling within the permitted range [–16, 15.5]. A positive value of the horizontal or vertical component of the motion vector signifies that the prediction is formed from pixels in the previous picture which are spatially to the right or below the pixels being predicted. Kuriki, [0005-0006], [0026-0028]:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	In addition to the above-described series of operations, the encoding apparatus performs an operation of skipping the variable length encoding when the quantization block or the motion vector has the same value as that of the adjacent macroblock or the macroblock at the same position in the previous or subsequent frame, which is referred to as a macroblock skip. Here, a macroblock that is skipped is referred to as a skipped macroblock. More specifically, in the case of a P picture, the encoding device performs the macroblock skip on a macroblock in which the quantization block is 0, that is, all the quantized DCT coefficients in the quantization block are 0 and the motion vector thereof is 0, and In the case of a B picture, the quantization block is 0, and the macroblock skip is performed for a macroblock whose motion vector is the same in magnitude and direction as the motion vector of the left adjacent macroblock of the current macroblock. However, the encoding apparatus sets the start and end of the slice to no macroblock skipping of the located macroblock is performed. … On the other hand, if it is determined in step 23 that the current macroblock is a B picture, the skip determination unit 120 calculates the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock, and determines whether or not the difference is equal to or smaller than the threshold value b (step 26). Here the previous the macro block means a macro block which is an encoding target immediately before the encoding target macro block. In a frame, it is usually a macroblock located on the left side of a macroblock to be encoded. Also, it is assumed that the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is calculated for each of the x component and the y component, and the skip determination unit 120 performs threshold determination for each of the x component and the y component of the difference. That is, the skip determination unit 120 determines whether both the x component and the y component of the difference are equal to or smaller than the threshold value b or whether one or both of the x component and the y component are larger

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	than the threshold value b. It is assumed that the determination in step 26 includes that the direction of prediction (forward prediction, backward prediction, bidirectional prediction, or the like) is the same between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock, that is, the reference frame is the same When it is determined in step 26 that both the x component and the y component of the difference are equal to or smaller than the threshold value b, the skip determination unit 120 determines that the macroblock is a skip macroblock (step 25). The skip determination unit 120 notifies the variable length coding unit 110, the motion vector replacement unit 121, and the addition unit 108 that the macroblock is determined to be a skip macroblock. In this way, in the case of a B picture, the skip determination unit 120 determines that the macroblock is a skip macroblock when the macroblock is not the first or last macroblock of the slice, the quantized block is 0, and the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is equal to or less than the threshold value b in both the x component and the y component. In the present embodiment, the threshold value b is 1.0. That is, when the skip determination unit 120 determines that both the x component and the y component of the motion vector difference between the current macroblock and the immediately preceding macroblock are equal to or smaller than 1.0, it determines that the current macroblock is a skip macroblock. If it is 1.0 or less, as in the case of the P picture, even if the coding of the macro block is omitted, the difference between the original image and the reproduced image is hardly noticeable to the human visual sense, so that there is substantially no problem. Note that the threshold value a and the threshold value b are not limited to 0.5 and 1.0, and, for example, the user may be allowed to set arbitrary values in the skip determination unit 120 within a range in which deterioration in image quality is allowable. Sugahara, 21:50-67.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	wherein said stream is an MPEG compressed video data stream in which each of said reference pictures is an I-picture or a P-picture and each of said predictively encoded pictures is a P-picture or a B-picture, each of said pictures for which prediction information is replaced is a B-picture, and wherein said copy data set includes motion vector information indicating that an overall amount of picture motion of a B-picture with respect to a corresponding temporally preceding reference picture or with respect to a corresponding temporally succeeding reference picture is zero and motion compensated prediction error information indicating that respective amounts of motion compensated prediction error for all macroblocks of said B-picture are zero, to thereby specify all macroblocks of said B-picture as being skipped macroblocks.
6. A method according to claim 1, wherein if the second segment has zero motion vector, the zero motion vector is assigned for skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector.	The below references, as evidence by the example citations, disclose that if the second segment has zero motion vector, the zero motion vector is assigned for skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector. *See, e.g.*, Hwang, 3:25-35: A current frame and a previous frame (in other words, a search frame and a reference frame) of a video signal are inputted to a motion vector detection block 100 and a full search block 200. At the motion vector detection block 100, to find a motion vector of a search block, i.e., a block currently being processed, motion vectors of processed neighboring blocks of the search block together with a 0 vector are examined to select a candidate motion vector, wherein processed blocks refers to blocks whose motion vectors are determined and the processed neighboring blocks are processed blocks neighboring the search block. Hwang, 3:36-56:

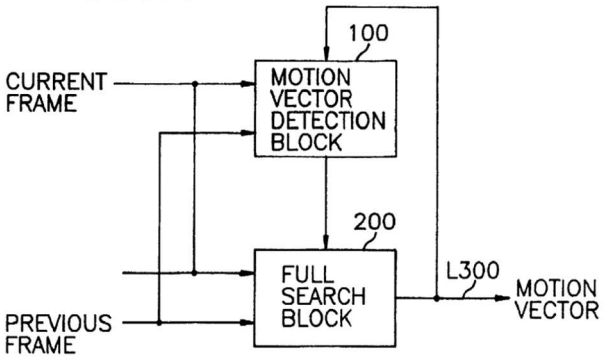
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	The processed neighboring blocks whose motion vectors are utilized in detecting the motion vector of the search block B(i,j) are exemplified in FIG. 4. As shown in FIG. 4, the search frame consists of a multiplicity of slices, each of which includes a number of blocks, the number of slices and the number of blocks in each slice being N2 and N1, respectively. The search frame are processed from the upper left corner to the lower right corner. Therefore, among 8 neighboring blocks surrounding the search block B(i,j), motion vectors of 4 neighboring blocks, i.e., an upper left block B(i-1, j-1), an upper middle block B(i,j-1), an upper right block B(i+1,j-1), and a middle left block B(i-1,j), are known when the search block is processed, wherein j represents a slice number and i designates a location of a block in a slice, i and j being positive integers not larger than N1 and N2, respectively. It can be easily known that, if a search block is not located on the boundary of a frame, the number of processed neighboring blocks is 4. In case the search block is on the boundary as in the case of B(1,1), B(1,2) and so on, the number of processed neighboring blocks may be less than 4. Hwang, 3:57-4:12: After the candidate motion vector is determined, a distortion between the search block and a predicted block corresponding to the candidate motion vector is compared with a predetermined threshold, wherein a predicted block corresponding to a vector is determined as a block of the reference frame which is displaced from the search block by the vector. If the distortion between the search block and the predicted block corresponding to the candidate motion vector is smaller than the threshold, the candidate motion vector is decided as a motion vector of the search block and provided on a line L300 through the full search block 200. Otherwise, a full search trigger signal is applied to the full search block 200 which detects a motion vector of the search block by using a full search block matching method in response to the full search trigger signal. The full search block 200 provides either the motion vector provided from the motion vector detection block 100 or the motion vector determined therein. The motion vector provided from the full search block 200 is fed back to the motion vector

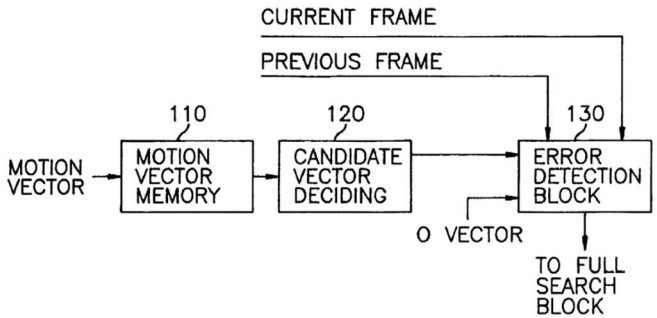
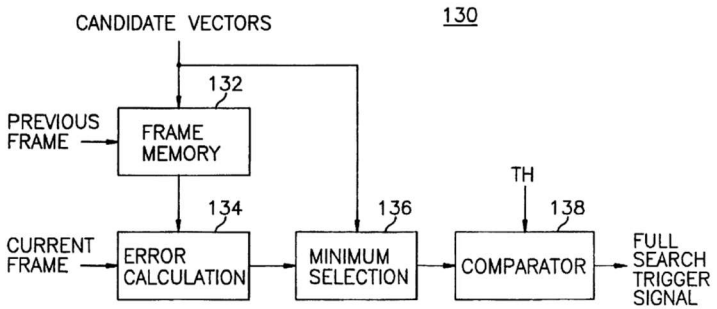
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	detection block 100, to be used in detecting motion vectors of subsequent blocks, e.g., B(i+1,j), of the current frame. Hwang, 4:33-50: Referring to FIG. 2, there is provided a detailed block diagram of the motion vector detection block 100 shown in FIG. 1. The motion vectors of the processed blocks are fed to a motion vector memory 110, to be stored therein. Among them, neighboring vectors which refer to motion vectors of the processed neighboring blocks are selected and coupled to a candidate vector deciding block 120. Referring again to FIG. 4, when the search block B(i,j) is being processed, at least motion vectors of the blocks B(i-1, j-1) to B(N1, j-1) and B(1,j) to B(i-1,j) should be stored at the motion vector memory 110. (Note that B(i, j-1) to B(N1, j-1) are necessary in determining motion vector of remaining blocks, i.e., B(i+1, j) to B(N1, j) included in a jth slice; and B(1, j) to B(i-1, j) are used in determining motion vectors of blocks included in a (j+1)st slice.) Therefore, the motion vector memory 110 should at least have (N1+1) memory spaces each of which can accommodate a motion vector of a processed block. Hwang, 5:11-27: Referring to FIG. 4, in case the number of processed neighboring blocks is 1, (for example, a search block B(2,1)) the motion vector of the processed neighboring block (B(1,1)) may be decided as both of the X and the Y vectors. At the error detection block 130, a distortion between the search block and each of three predicted blocks corresponding to the three candidate vectors inputted thereto is determined, wherein the distortion is a value which represents a difference between two blocks. Of the three candidate vectors, one with a minimum distortion is selected as the candidate motion vector. If

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	the minimum distortion of the candidate motion vector is smaller than the threshold TH, the candidate motion vector is determined as the final motion vector of the search block. Accordingly, a procedure for detecting a motion vector of the search block is completed and the motion vector is provided on L300 through the full search block 200. Hwang, Figs. 1-4: *FIG. 1* 

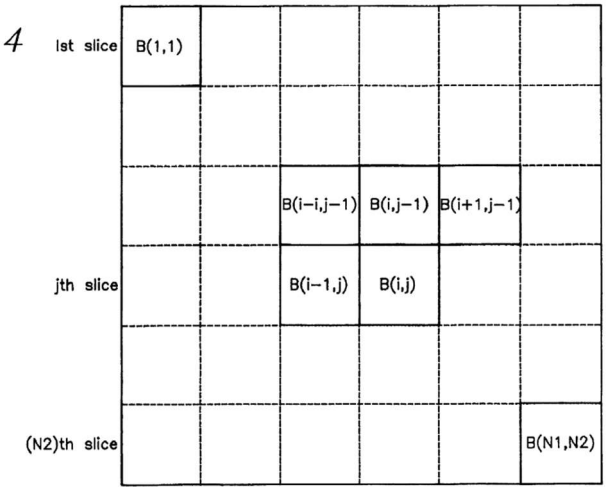
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	FIG. 2  *FIG. 3* 

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:

FIG. 4



The ’808 patent, 8:19-10:22:

> Operation of the video decoder 200, shown in FIG. 2 will now be described. The decoder 200 comprises a video multiplex decoder 270, which receives an encoded video bit-stream 135 from the encoder 100 and demultiplexes it into its constituent parts, an inverse quantizer 210, an inverse DCT transformer 220, a motion compensated prediction block 240, a frame store 250, a combiner 230, a control manager 260, and an output 280.
>
> The control manager 260 controls the operation of the decoder 200 in response to whether an INTRA- or an INTER-coded frame is being decoded. An INTRA/INTER trigger control signal, which causes the decoder to switch between decoding modes is derived, for example, from picture type information associated with each compressed video frame received from the encoder. The INTRA/INTER trigger control signal is extracted from the encoded video bit-stream by the video multiplex decoder 270 and is passed to control manager 260 via control

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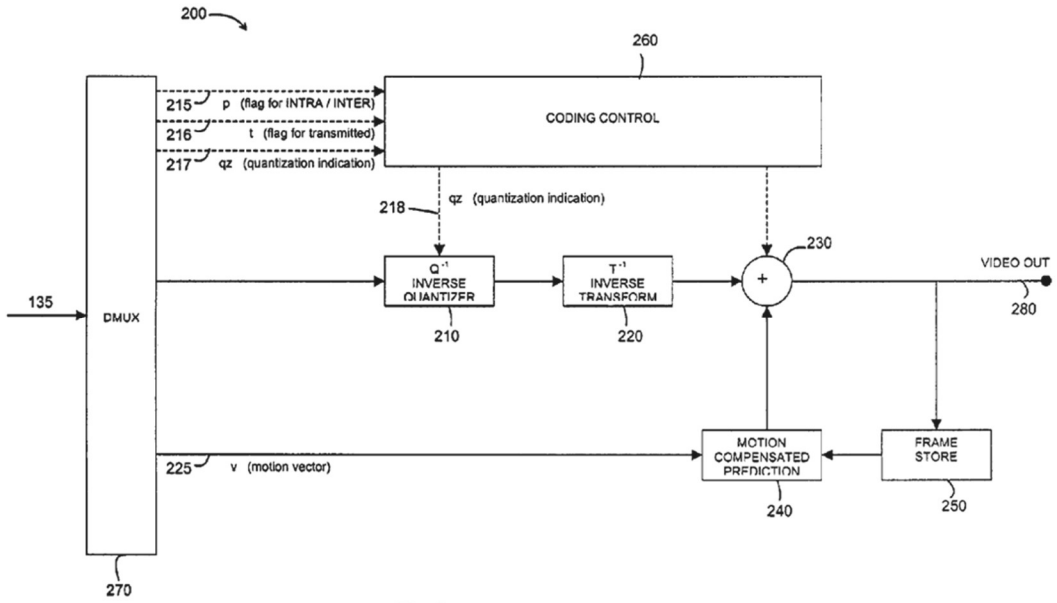
ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	line 215. Decoding of an INTRA-coded frame is performed on a macroblock-by-macroblock basis, each macroblock being decoded substantially as soon as encoded information relating to it is received in the video bit-stream 135. The video multiplex decoder 270 separates the encoded information for the blocks of the macroblock from possible control information relating to the macroblock in question. The encoded information for each block of an INTRA-coded macroblock comprises variable length codewords representing the entropy coded level and run values for the non-zero quantized DCT coefficients of the block. The video multiplex decoder 270 decodes the variable length codewords using a variable length decoding method corresponding to the encoding method used in the encoder 100 and thereby recovers the level and run values. It then reconstructs the array of quantized transform coefficient values for each block of the macroblock and passes them to inverse quantizer 210. Any control information relating to the macroblock is also decoded in the video multiplex decoder 270 using an appropriate decoding method and is passed to control manager 260. In particular, information relating to the level of quantization applied to the transform coefficients is extracted from the encoded bit-stream by video multiplex decoder 270 and provided to control manager 260 via control line 217. The control manager, in turn, conveys this information to inverse quantizer 210 via control line 218. Inverse quantizer 210 inverse quantizes the quantized DCT coefficients for each block of the macroblock according to the control information and provides the now inverse quantized DCT coefficients to inverse DCT transformer 220. Inverse DCT transformer 220 performs an inverse DCT transform on the inverse quantized DCT coefficients for each block of the macroblock to form a decoded block of image information comprising reconstructed pixel values. The reconstructed pixel values for each block of the macroblock are passed via combiner 230 to the video output 280 of the decoder where, for example, they can be provided to a display device (not shown). The reconstructed pixel values for each block are also stored in frame store 250. Because motion-compensated prediction is not used in the encoding/decoding of INTRA coded macroblocks control manager

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	260 controls combiner 230 to pass each block of pixel values as such to the video output 280 and frame store 250. As subsequent macroblocks of the INTRA-coded frame are decoded and stored, a decoded frame is progressively assembled in the frame store 250 and thus becomes available for use as a reference frame for motion compensated prediction in connection with the decoding of subsequently received INTER-coded frames. INTER-coded frames are also decoded macroblock by macroblock, each INTER-coded macroblock being decoded substantially as soon as encoded information relating to it is received in the bit-stream 135. The video multiplex decoder 270 separates the encoded prediction error information for each block of an INTER-coded macroblock from encoded motion vector information and possible control information relating to the macroblock in question. As explained in the foregoing, the encoded prediction error information for each block of the macroblock comprises variable length codewords representing the entropy coded level and run values for the non-zero quantized transform coefficients of the prediction error block in question. The video multiplex decoder 270 decodes the variable length codewords using a variable length decoding method corresponding to the encoding method used in the encoder 100 and thereby recovers the level and run values. It then reconstructs an array of quantized transform coefficient values for each prediction error block and passes them to inverse quantizer 210. Control information relating to the INTER-coded macroblock is also decoded in the video multiplex decoder 270 using an appropriate decoding method and is passed to control manager 260. Information relating to the level of quantization applied to the transform coefficients of the prediction error blocks is extracted from the encoded bit-stream and provided to control manager 260 via control line 217. The control manager, in turn, conveys this information to inverse quantizer 210 via control line 218. Inverse quantizer 210 inverse quantizes the quantized DCT coefficients representing the prediction error information for each block of the macroblock according to the control information and provides the now inverse quantized DCT coefficients to inverse DCT transformer 220. The inverse quantized DCT coefficients representing the prediction error information for each block are then inverse

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	transformed in the inverse DCT transformer 220 to yield an array of reconstructed prediction error values for each block of the macroblock. The encoded motion vector information associated with the macroblock is extracted from the encoded video bit-stream 135 by video multiplex decoder 270 and is decoded. The decoded motion vector information thus obtained is passed via control line 225 to motion compensated prediction block 240, which reconstructs a motion vector for the macroblock using the same motion model as that used to encode the INTER-coded macroblock in encoder 100. The reconstructed motion vector approximates the motion vector originally determined by motion estimation block 130 of the encoder. The motion compensated prediction block 240 of the decoder uses the reconstructed motion vector to identify the location of a region of reconstructed pixels in a prediction reference frame stored in frame store 250. The reference frame may be, for example, a previously decoded INTRA-coded frame, or a previously decoded INTER-coded frame. In either case, the region of pixels indicated by the reconstructed motion vector is used to form a prediction for the macroblock in question. More specifically, the motion compensated prediction block 240 forms an array of pixel values for each block of the macroblock by copying corresponding pixel values from the region of pixels identified by the motion vector. The prediction, that is the blocks of pixel values derived from the reference frame, are passed from motion compensated prediction block 240 to combiner 230 where they are combined with the decoded prediction error information. In practice, the pixel values of each predicted block are added to corresponding reconstructed prediction error values output by inverse DCT transformer 220. In this way an array of reconstructed pixel values for each block of the macroblock is obtained. The reconstructed pixel values are passed to the video output 280 of the decoder and are also stored in frame store 250. As subsequent macroblocks of the INTER-coded frame are decoded and stored, a decoded frame is progressively assembled in the frame store 250 and thus becomes available for use as a reference frame for motion-compensated prediction of other INTER-coded frames.

ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	The ’808 patent, FIG. 2:  Fig. 2 (PRIOR ART) Kuriki, [0002], [0004], [0008]: [Prior art] An encoding apparatus for compression-encoding moving image data by the MPEG method compresses moving image data by performing inter-frame prediction by motion compensation (hereinafter, referred to as motion compensated prediction). The frame of the past of a frame, or the future (or the both) to which an object block belongs with motion

ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	compensation prediction about the block (it is hereafter called an object block) of the coding subject in a video data (hereinafter, referred to as a reference frame), and obtains a difference (hereinafter, referred to as a prediction error) of each pixel between the target block and the reference block, and a motion vector indicating a relative positional relationship between both blocks. Typically, motion compensated prediction is performed on a macroblock basis. … Here, the encoding type will be described. There are three kinds of encoding types, i.e., I picture, P picture, and B picture, and any one of the three kinds of encoding types is determined for each frame, and each frame is encoded by a different encoding method according to the encoding type. In a frame of an I picture, a luminance signal and two color difference signals of a macro block are subjected to DCT, quantization and variable length coding without performing motion compensation prediction. The I-picture frame serves as a reference frame of a frame of another encoding type. A frame of a P picture is motion-compensated and predicted using a frame of a past I picture or P picture as a reference frame, and a prediction error after the motion-compensated prediction is subjected to DCT, quantization, and variable length coding. The frame of the P picture serves as a reference frame of a macroblock of another P picture or B picture. The encoding method of the P picture is called unidirectional prediction. The frame of the B picture is motion-compensated and predicted using the frame of the past or future (or both) I picture or P picture as a reference frame, and the resulting prediction error is subjected to DCT, quantization, and variable length coding. It does not become a reference frame for other frames. The B-picture encoding method is called bidirectional prediction because it is predicted from both the past and future directions …. When a decoding device for decoding moving image data detects that there is a skip macroblock from an address of a macroblock, the decoding device performs: The P picture is

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	decoded by using a block at the same position as the skip macro block in the reference frame of the picture, and the B picture is decoded by using the motion vector of the left adjacent macro block. Lee, 63-64: Thus inter coding can be performed according to one of the following 15 modes of operation: SKIP: The current MB is replaced by the MB at the same spatial location in the previous reconstructed picture. Encoding is performed by skipping the current MB and incrementing the MB address. This mode is designed for areas in the picture where little or no change relative to the previously reconstructed picture is detected. FR-PMV: One motion vector for the current MB is predicted and used as an estimate. Motion vector searching is not performed. As only motion compensation is required, the MB is encoded using the header and the motion vector bits. When motion vectors can be accurately predicted, this mode becomes a likely candidate. H.263, § 6.1.1:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	6.1.1 Differential motion vectors The macroblock vector is obtained by adding predictors to the vector differences indicated by MVD (see Table 11). For differential coding with four vectors per macroblock, refer to Annex F. In case of one vector per macroblock, the candidate predictors for the differential coding are taken from three surrounding macroblocks as indicated in Figure 11. The predictors are calculated separately for the horizontal and vertical components. In the special cases at the borders of the current GOB or picture, the following decision rules are applied in increasing order: 1) When the corresponding macroblock was coded in INTRA mode (if not in PB-frames mode) or was not coded (COD = 1), the candidate predictor is set to zero. 2) The candidate predictor MV1 is set to zero if the corresponding macroblock is outside the picture (at the left side). 3) Then, the candidate predictors MV2 and MV3 are set to MV1 if the corresponding macroblocks are outside the picture (at the top) or outside the GOB (at the top) if the GOB header of the current GOB is non-empty. 4) Then, the candidate predictor MV3 is set to zero if the corresponding macroblock is outside the picture (at the right side). For each component, the predictor is the median value of the three candidate predictors for this component. Advantage is taken of the fact that the range of motion vector component values is constrained. Each VLC word for MVD represents a pair of difference values. Only one of the pair will yield a macroblock vector component falling within the permitted range [–16, 15.5]. A positive value of the horizontal or vertical component of the motion vector signifies that the prediction is formed from pixels in the previous picture which are spatially to the right or below the pixels being predicted. Kuriki, [0005-0006], [0026-0028]: In addition to the above-described series of operations, the encoding apparatus performs an operation of skipping the variable length encoding when the quantization block or the motion vector has the same value as that of the adjacent macroblock or the macroblock at the same

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	position in the previous or subsequent frame, which is referred to as a macroblock skip. Here, a macroblock that is skipped is referred to as a skipped macroblock. More specifically, in the case of a P picture, the encoding device performs the macroblock skip on a macroblock in which the quantization block is 0, that is, all the quantized DCT coefficients in the quantization block are 0 and the motion vector thereof is 0, and In the case of a B picture, the quantization block is 0, and the macroblock skip is performed for a macroblock whose motion vector is the same in magnitude and direction as the motion vector of the left adjacent macroblock of the current macroblock. However, the encoding apparatus sets the start and end of the slice to no macroblock skipping of the located macroblock is performed. … On the other hand, if it is determined in step 23 that the current macroblock is a B picture, the skip determination unit 120 calculates the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock, and determines whether or not the difference is equal to or smaller than the threshold value b (step 26). Here the previous the macro block means a macro block which is an encoding target immediately before the encoding target macro block. In a frame, it is usually a macroblock located on the left side of a macroblock to be encoded. Also, it is assumed that the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is calculated for each of the x component and the y component, and the skip determination unit 120 performs threshold determination for each of the x component and the y component of the difference. That is, the skip determination unit 120 determines whether both the x component and the y component of the difference are equal to or smaller than the threshold value b or whether one or both of the x component and the y component are larger than the threshold value b. It is assumed that the determination in step 26 includes that the direction of prediction (forward prediction, backward prediction, bidirectional prediction, or the like) is the same between the motion vector of the current macroblock and the motion vector of

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	the immediately preceding macroblock, that is, the reference frame is the same When it is determined in step 26 that both the x component and the y component of the difference are equal to or smaller than the threshold value b, the skip determination unit 120 determines that the macroblock is a skip macroblock (step 25). The skip determination unit 120 notifies the variable length coding unit 110, the motion vector replacement unit 121, and the addition unit 108 that the macroblock is determined to be a skip macroblock. In this way, in the case of a B picture, the skip determination unit 120 determines that the macroblock is a skip macroblock when the macroblock is not the first or last macroblock of the slice, the quantized block is 0, and the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is equal to or less than the threshold value b in both the x component and the y component. In the present embodiment, the threshold value b is 1.0. That is, when the skip determination unit 120 determines that both the x component and the y component of the motion vector difference between the current macroblock and the immediately preceding macroblock are equal to or smaller than 1.0, it determines that the current macroblock is a skip macroblock. If it is 1.0 or less, as in the case of the P picture, even if the coding of the macro block is omitted, the difference between the original image and the reproduced image is hardly noticeable to the human visual sense, so that there is substantially no problem. Note that the threshold value a and the threshold value b are not limited to 0.5 and 1.0, and, for example, the user may be allowed to set arbitrary values in the skip determination unit 120 within a range in which deterioration in image quality is allowable. Sugahara, 6:65-7:15. The method is designed for application to an MPEG compressed video data stream, i.e., in which each of the reference pictures is an MPEG I-picture or P-picture, and each of the predictively encoded pictures is a P-picture or a B-picture. The method can be implemented

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	such that each of the pictures for which prediction information is replaced is a B-picture, and the copy data set includes motion vector information indicating that an overall amount of picture motion of a B-picture with respect to a corresponding temporally preceding or succeeding reference picture is zero, and motion compensated prediction error information indicating that respective amounts of motion compensated prediction error for all macroblocks of the B-picture are zero. That is to say, all macroblocks of the B-picture are indicated as being skipped macroblocks, so that at the time of decoding the MPEG data stream, that B-picture will be decoded as an identical copy of a corresponding reference picture. Sugahara, 19:15-20. Each time step S10, S12 or S15 has been executed, operation returns to step S5 in which the counter n is incremented, and if n has not reached a value equal to the total number of columns of macroblocks constituting a picture (step S6, N), operation returns to step S2, to then select and process the next picture in the temporal sequence. Sugahara, Figs. 16B-16C.

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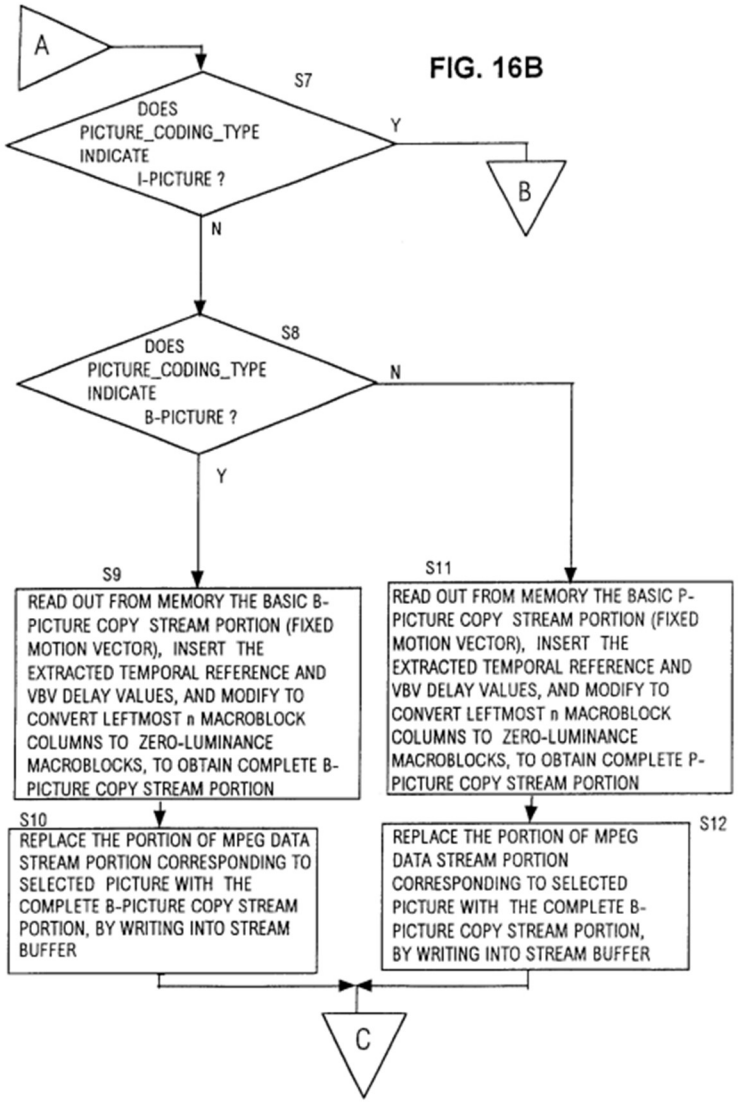
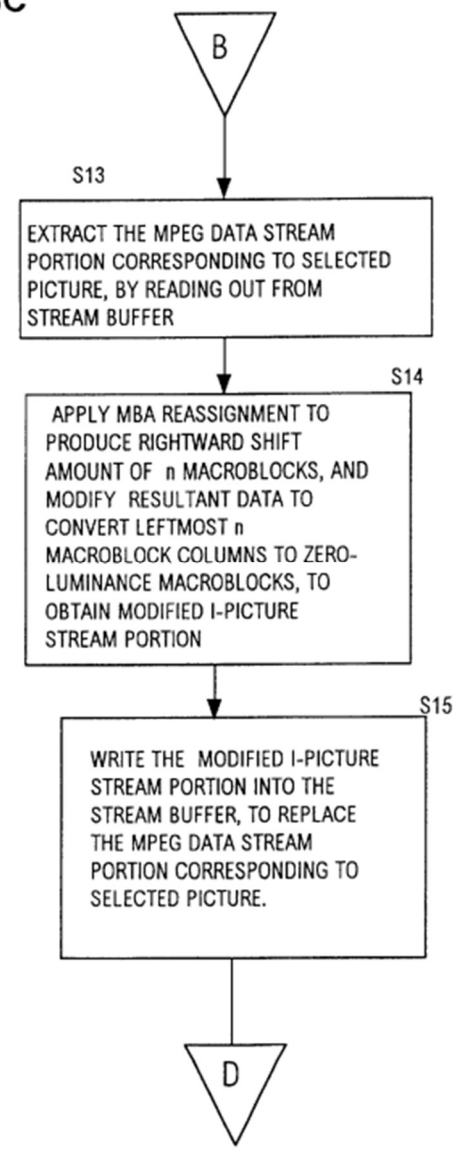


FIG. 16B

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FIG. 16C



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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	Sugahara, 21:50-67. wherein said stream is an MPEG compressed video data stream in which each of said reference pictures is an I-picture or a P-picture and each of said predictively encoded pictures is a P-picture or a B-picture, each of said pictures for which prediction information is replaced is a B-picture, and wherein said copy data set includes motion vector information indicating that an overall amount of picture motion of a B-picture with respect to a corresponding temporally preceding reference picture or with respect to a corresponding temporally succeeding reference picture is zero and motion compensated prediction error information indicating that respective amounts of motion compensated prediction error for all macroblocks of said B-picture are zero, to thereby specify all macroblocks of said B-picture as being skipped macroblocks.
7[preamble] A method of decoding an encoded video sequence, the method comprising:	The below references, as evidence by the example citations, disclose a method of decoding an encoded video sequence. *See, e.g.*, The '808 patent, 4:44-60: In order to illustrate the operation of a generic video coding system in greater detail, reference will now be made to the exemplary video encoder and video decoder illustrated in FIGS. 1 and 2 of the accompanying drawings. The video encoder 100 of FIG. 1 employs a combination of INTRA- and INTER-coding to produce a compressed (encoded) video bit-stream and decoder 200 of FIG. 2 is arranged to receive and decode the video bit-stream produced by encoder 100 in order to produce a reconstructed video sequence. Throughout the following description it will be assumed that the luminance component of a macroblock comprises 16×16 pixels arranged as an array of 4, 8×8 blocks, and that the associated chrominance components are spatially sub-sampled by a factor of two in the horizontal and vertical directions to form 8×8

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	blocks, as depicted in FIG. 3. Extension of the description to other block sizes and other sub-sampling schemes will be apparent to those of ordinary skill in the art. The '808 patent, 8:19-10:22: Operation of the video decoder 200, shown in FIG. 2 will now be described. The decoder 200 comprises a video multiplex decoder 270, which receives an encoded video bit-stream 135 from the encoder 100 and demultiplexes it into its constituent parts, an inverse quantizer 210, an inverse DCT transformer 220, a motion compensated prediction block 240, a frame store 250, a combiner 230, a control manager 260, and an output 280. The control manager 260 controls the operation of the decoder 200 in response to whether an INTRA- or an INTER-coded frame is being decoded. An INTRA/INTER trigger control signal, which causes the decoder to switch between decoding modes is derived, for example, from picture type information associated with each compressed video frame received from the encoder. The INTRA/INTER trigger control signal is extracted from the encoded video bit-stream by the video multiplex decoder 270 and is passed to control manager 260 via control line 215. Decoding of an INTRA-coded frame is performed on a macroblock-by-macroblock basis, each macroblock being decoded substantially as soon as encoded information relating to it is received in the video bit-stream 135. The video multiplex decoder 270 separates the encoded information for the blocks of the macroblock from possible control information relating to the macroblock in question. The encoded information for each block of an INTRA-coded macroblock comprises variable length codewords representing the entropy coded level and run values for the non-zero quantized DCT coefficients of the block. The video multiplex decoder 270 decodes the variable length codewords using a variable length decoding method corresponding to the encoding method used in the encoder 100 and thereby recovers the level and run values. It then reconstructs the array of quantized transform coefficient values for each

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	block of the macroblock and passes them to inverse quantizer 210. Any control information relating to the macroblock is also decoded in the video multiplex decoder 270 using an appropriate decoding method and is passed to control manager 260. In particular, information relating to the level of quantization applied to the transform coefficients is extracted from the encoded bit-stream by video multiplex decoder 270 and provided to control manager 260 via control line 217. The control manager, in turn, conveys this information to inverse quantizer 210 via control line 218. Inverse quantizer 210 inverse quantizes the quantized DCT coefficients for each block of the macroblock according to the control information and provides the now inverse quantized DCT coefficients to inverse DCT transformer 220. Inverse DCT transformer 220 performs an inverse DCT transform on the inverse quantized DCT coefficients for each block of the macroblock to form a decoded block of image information comprising reconstructed pixel values. The reconstructed pixel values for each block of the macroblock are passed via combiner 230 to the video output 280 of the decoder where, for example, they can be provided to a display device (not shown). The reconstructed pixel values for each block are also stored in frame store 250. Because motion-compensated prediction is not used in the encoding/decoding of INTRA coded macroblocks control manager 260 controls combiner 230 to pass each block of pixel values as such to the video output 280 and frame store 250. As subsequent macroblocks of the INTRA-coded frame are decoded and stored, a decoded frame is progressively assembled in the frame store 250 and thus becomes available for use as a reference frame for motion compensated prediction in connection with the decoding of subsequently received INTER-coded frames. INTER-coded frames are also decoded macroblock by macroblock, each INTER-coded macroblock being decoded substantially as soon as encoded information relating to it is received in the bit-stream 135. The video multiplex decoder 270 separates the encoded prediction error information for each block of an INTER-coded macroblock from encoded motion vector information and possible control information relating to the macroblock in question. As explained in the foregoing, the encoded prediction error information for each

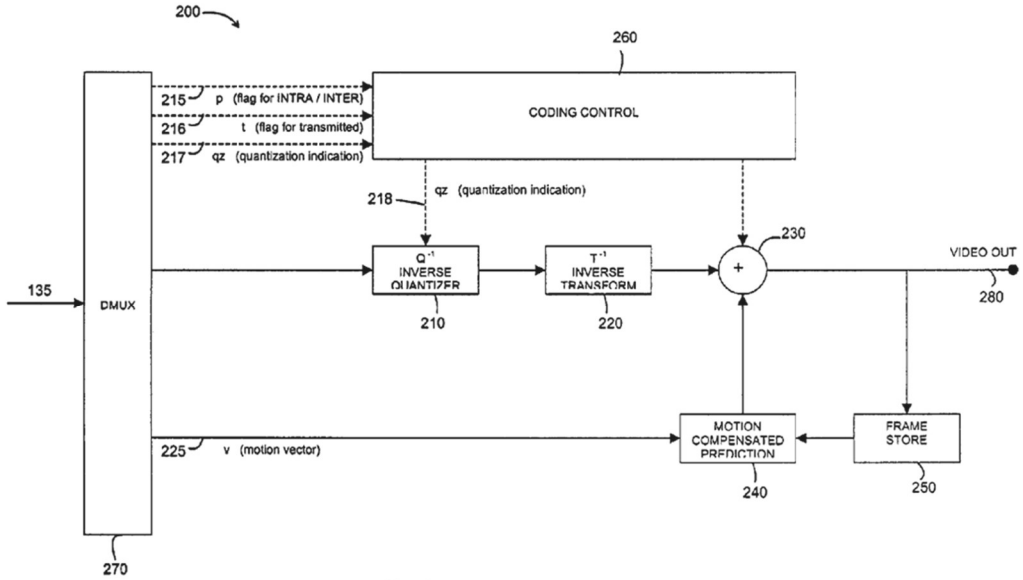
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	block of the macroblock comprises variable length codewords representing the entropy coded level and run values for the non-zero quantized transform coefficients of the prediction error block in question. The video multiplex decoder 270 decodes the variable length codewords using a variable length decoding method corresponding to the encoding method used in the encoder 100 and thereby recovers the level and run values. It then reconstructs an array of quantized transform coefficient values for each prediction error block and passes them to inverse quantizer 210. Control information relating to the INTER-coded macroblock is also decoded in the video multiplex decoder 270 using an appropriate decoding method and is passed to control manager 260. Information relating to the level of quantization applied to the transform coefficients of the prediction error blocks is extracted from the encoded bit-stream and provided to control manager 260 via control line 217. The control manager, in turn, conveys this information to inverse quantizer 210 via control line 218. Inverse quantizer 210 inverse quantizes the quantized DCT coefficients representing the prediction error information for each block of the macroblock according to the control information and provides the now inverse quantized DCT coefficients to inverse DCT transformer 220. The inverse quantized DCT coefficients representing the prediction error information for each block are then inverse transformed in the inverse DCT transformer 220 to yield an array of reconstructed prediction error values for each block of the macroblock. The encoded motion vector information associated with the macroblock is extracted from the encoded video bit-stream 135 by video multiplex decoder 270 and is decoded. The decoded motion vector information thus obtained is passed via control line 225 to motion compensated prediction block 240, which reconstructs a motion vector for the macroblock using the same motion model as that used to encode the INTER-coded macroblock in encoder 100. The reconstructed motion vector approximates the motion vector originally determined by motion estimation block 130 of the encoder. The motion compensated prediction block 240 of the decoder uses the reconstructed motion vector to identify the location of a region of reconstructed pixels in a prediction reference frame stored in frame store 250. The reference

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	frame may be, for example, a previously decoded INTRA-coded frame, or a previously decoded INTER-coded frame. In either case, the region of pixels indicated by the reconstructed motion vector is used to form a prediction for the macroblock in question. More specifically, the motion compensated prediction block 240 forms an array of pixel values for each block of the macroblock by copying corresponding pixel values from the region of pixels identified by the motion vector. The prediction, that is the blocks of pixel values derived from the reference frame, are passed from motion compensated prediction block 240 to combiner 230 where they are combined with the decoded prediction error information. In practice, the pixel values of each predicted block are added to corresponding reconstructed prediction error values output by inverse DCT transformer 220. In this way an array of reconstructed pixel values for each block of the macroblock is obtained. The reconstructed pixel values are passed to the video output 280 of the decoder and are also stored in frame store 250. As subsequent macroblocks of the INTER-coded frame are decoded and stored, a decoded frame is progressively assembled in the frame store 250 and thus becomes available for use as a reference frame for motion-compensated prediction of other INTER-coded frames. The ’808 patent, 20:26-42: Operation of a video decoder 700 according to an embodiment of the invention will now be described with reference to FIG. 7. The structure of the video decoder illustrated in FIG. 7 is substantially identical to that of the prior art video decoder shown in FIG. 2, with appropriate modifications to those parts of the decoder that perform motion estimation operations. All parts of the video decoder which implement functions and operate in a manner identical to the previously described prior art video decoder are identified with identical reference numbers. It is further assumed that the video decoder of FIG. 7 corresponds to the encoder described in connection with FIG. 6 and is therefore capable of receiving and decoding the bit-stream 635 transmitted by encoder 600. Furthermore, as the present invention affects the decoding of video frames in INTER-coded format, description of the operations performed by decoder 700 in

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	connection with the decoding of INTRA-coded frames will be omitted. The '808 patent, FIG. 2:  Fig. 2 (PRIOR ART) Hsieh, 995: In general moving scenes, motion objects often cover many small blocks such that the motion of the spatial neighbor blocks may be similar. In addition, due to the continuity of motion in temporal direction, the motion of the temporal neighbor blocks may be highly correlated. In other words, the motion vector of the current block can be predicted from that of the neighbor

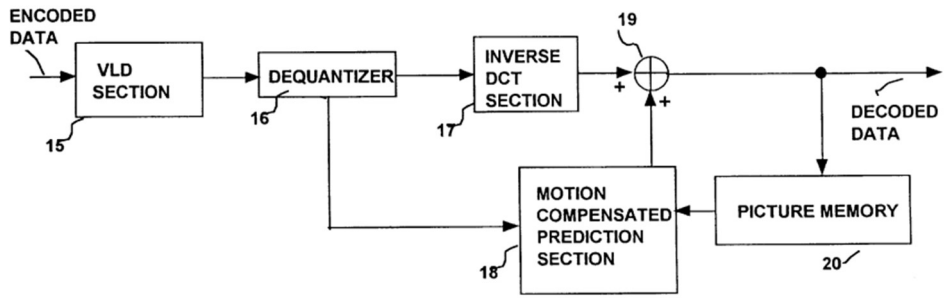
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	blocks in the temporal or spatial direction. Sugahara, 4:11-5:23. FIG. 20 is a general system block diagram showing an example of a MPEG decoder for operating on MPEG-compressed video data. In FIG. 20, the input MPEG encoded data are subjected to decoding by a VLD (variable-length decoder) 15, and the resultant data are processed by a dequantizer 16 such as to recover values which are close approximations to the originally derived DCT coefficients, and inverse DCT processing is then applied to these by an inverse DCT section 17. In addition, the motion vector information and prediction mode information for each macroblock are extracted by the VLD 15 from the decoded input data stream, and supplied to a motion compensated prediction section 18. As the data for an I-picture or P-picture are recovered by the decoder, they are successively stored in a picture memory 20, to form a reference picture, whose data are also supplied to the motion compensated prediction section 18. As the recovered motion compensated prediction error value for a pixel of a macroblock is produced from the inverse DCT section 17, then (in the case of forward prediction or backward prediction) it is added to the value of the corresponding pixel from the reference picture that is currently held in the picture memory 20, after motion compensation has been applied to that reference picture by the motion compensated prediction section 18, with the amount of motion compensation being determined by the motion vector for the macroblock that is currently being processed. In that way, successive macroblocks of each of successive P and B-pictures are recovered from the MPEG-encoded compressed data. An MPEG picture can be encoded as one or more sets of macroblock, referred to as slices. In the simplest case only a single slice is utilized, i.e., constituting all of the macroblocks of a picture. The output generated by an MPEG encoder is an ordered continuous stream of bits, consisting of successive bit patterns and code values, with sets of stuffing bits inserted where necessary. A

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	multi-layer configuration is utilized, in which successive layers convey information ranging from indications of the start and end points of the MPEG-encoded data stream down to the sets of quantized encoded DCT coefficient values for the respective blocks of macroblocks of a picture. The highest layer is the video sequence layer, containing bit patterns for indicating the aforementioned start and end points of the MPEG data stream, and containing a succession of sets of information relating to respective GOPs ("group of pictures" units), constituting a GOP layer. The term "group of pictures" refers to a sequence consisting of an I-picture followed by a combination of B-pictures and P-pictures, with a typical GOP arrangement being illustrated in FIG. 3. Here, numeral 36 denotes an I-picture at the start of a GOP set which is formed of 12 successive pictures as shown, in the sequence I, B, B, P, B, B, P, B, B, P, B, B, with the P-pictures designated as 37, 38, 39 respectively. The distance (in picture units) M between each pair of reference pictures (I- or P-pictures) is 3, while the length N of the GOP set is 12. Each set of picture layer information contains information relating to each of the slices of that picture, constituting a slice layer, and the slice layer information for each specific slice contains information relating to all of the macroblocks of that slice, as a macroblock layer. Each portion of the macroblock layer relating to a specific macroblock contains encoded DCT coefficients specifying the luminance and chrominance values of the blocks which constitute the macroblock, either directly or as prediction error values. However if a macroblock has been judged to be identical to the correspondingly positioned macroblock of a reference picture at the time of encoding, then no information is actually encoded for that macroblock, which is referred to as a skipped macroblock. Specifically, a macroblock is indicated as being "skipped", in the MPEG data, by omitting to specify an incremental address value (or any other information) for that macroblock. As a result, referring to the decoder example of FIG. 20, at the time when decoding of such a skipped macroblock is executed, the chrominance and luminance values for the correspondingly positioned macroblock of the reference picture will be read out from the picture memory 20 and transferred unchanged via the motion compensated prediction section 18 and the adder 19 to

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	the output of the decoder. Sugahara, Fig. 20. FIG. 20 PRIOR ART  Sugahara, 6:65-7:15. The method is designed for application to an MPEG compressed video data stream, i.e., in which each of the reference pictures is an MPEG I-picture or P-picture, and each of the predictively encoded pictures is a P-picture or a B-picture. The method can be implemented such that each of the pictures for which prediction information is replaced is a B-picture, and the copy data set includes motion vector information indicating that an overall amount of picture motion of a B-picture with respect to a corresponding temporally preceding or succeeding reference picture is zero, and motion compensated prediction error information indicating that respective amounts of motion compensated prediction error for all macroblocks of the B-picture are zero. That is to say, all macroblocks of the B-picture are indicated as being

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	skipped macroblocks, so that at the time of decoding the MPEG data stream, that B-picture will be decoded as an identical copy of a corresponding reference picture.
7[a] receiving an indication of a skip coding mode for a first segment;	The below references, as evidence by the example citations, disclose receiving an indication of a skip coding mode for a first segment. *See, e.g.*, The '808 patent, 4:44-60: In order to illustrate the operation of a generic video coding system in greater detail, reference will now be made to the exemplary video encoder and video decoder illustrated in FIGS. 1 and 2 of the accompanying drawings. The video encoder 100 of FIG. 1 employs a combination of INTRA- and INTER-coding to produce a compressed (encoded) video bit-stream and decoder 200 of FIG. 2 is arranged to receive and decode the video bit-stream produced by encoder 100 in order to produce a reconstructed video sequence. Throughout the following description it will be assumed that the luminance component of a macroblock comprises 16×16 pixels arranged as an array of 4, 8×8 blocks, and that the associated chrominance components are spatially sub-sampled by a factor of two in the horizontal and vertical directions to form 8×8 blocks, as depicted in FIG. 3. Extension of the description to other block sizes and other sub-sampling schemes will be apparent to those of ordinary skill in the art. The '808 patent, 8:19-10:22: Operation of the video decoder 200, shown in FIG. 2 will now be described. The decoder 200 comprises a video multiplex decoder 270, which receives an encoded video bit-stream 135 from the encoder 100 and demultiplexes it into its constituent parts, an inverse quantizer 210, an inverse DCT transformer 220, a motion compensated prediction block 240, a frame store

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	250, a combiner 230, a control manager 260, and an output 280. The control manager 260 controls the operation of the decoder 200 in response to whether an INTRA- or an INTER-coded frame is being decoded. An INTRA/INTER trigger control signal, which causes the decoder to switch between decoding modes is derived, for example, from picture type information associated with each compressed video frame received from the encoder. The INTRA/INTER trigger control signal is extracted from the encoded video bit-stream by the video multiplex decoder 270 and is passed to control manager 260 via control line 215. Decoding of an INTRA-coded frame is performed on a macroblock-by-macroblock basis, each macroblock being decoded substantially as soon as encoded information relating to it is received in the video bit-stream 135. The video multiplex decoder 270 separates the encoded information for the blocks of the macroblock from possible control information relating to the macroblock in question. The encoded information for each block of an INTRA-coded macroblock comprises variable length codewords representing the entropy coded level and run values for the non-zero quantized DCT coefficients of the block. The video multiplex decoder 270 decodes the variable length codewords using a variable length decoding method corresponding to the encoding method used in the encoder 100 and thereby recovers the level and run values. It then reconstructs the array of quantized transform coefficient values for each block of the macroblock and passes them to inverse quantizer 210. Any control information relating to the macroblock is also decoded in the video multiplex decoder 270 using an appropriate decoding method and is passed to control manager 260. In particular, information relating to the level of quantization applied to the transform coefficients is extracted from the encoded bit-stream by video multiplex decoder 270 and provided to control manager 260 via control line 217. The control manager, in turn, conveys this information to inverse quantizer 210 via control line 218. Inverse quantizer 210 inverse quantizes the quantized DCT coefficients for each block of the macroblock according to the control information and provides

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	the now inverse quantized DCT coefficients to inverse DCT transformer 220. Inverse DCT transformer 220 performs an inverse DCT transform on the inverse quantized DCT coefficients for each block of the macroblock to form a decoded block of image information comprising reconstructed pixel values. The reconstructed pixel values for each block of the macroblock are passed via combiner 230 to the video output 280 of the decoder where, for example, they can be provided to a display device (not shown). The reconstructed pixel values for each block are also stored in frame store 250. Because motion-compensated prediction is not used in the encoding/decoding of INTRA coded macroblocks control manager 260 controls combiner 230 to pass each block of pixel values as such to the video output 280 and frame store 250. As subsequent macroblocks of the INTRA-coded frame are decoded and stored, a decoded frame is progressively assembled in the frame store 250 and thus becomes available for use as a reference frame for motion compensated prediction in connection with the decoding of subsequently received INTER-coded frames. INTER-coded frames are also decoded macroblock by macroblock, each INTER-coded macroblock being decoded substantially as soon as encoded information relating to it is received in the bit-stream 135. The video multiplex decoder 270 separates the encoded prediction error information for each block of an INTER-coded macroblock from encoded motion vector information and possible control information relating to the macroblock in question. As explained in the foregoing, the encoded prediction error information for each block of the macroblock comprises variable length codewords representing the entropy coded level and run values for the non-zero quantized transform coefficients of the prediction error block in question. The video multiplex decoder 270 decodes the variable length codewords using a variable length decoding method corresponding to the encoding method used in the encoder 100 and thereby recovers the level and run values. It then reconstructs an array of quantized transform coefficient values for each prediction error block and passes them to inverse quantizer 210. Control information relating to the INTER-coded macroblock is also decoded in the video multiplex decoder 270 using an appropriate decoding method and is

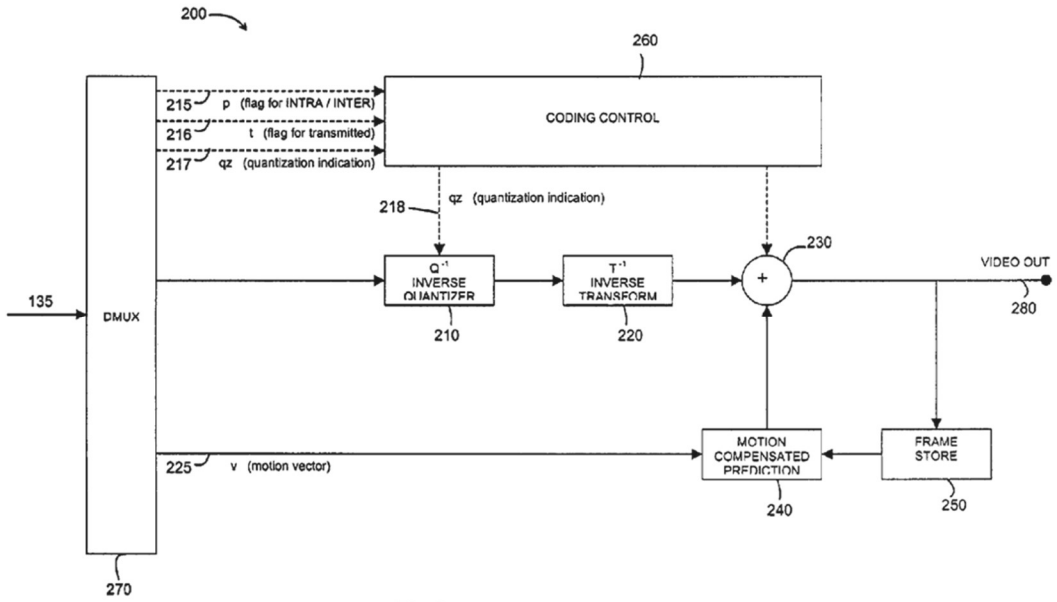
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	passed to control manager 260. Information relating to the level of quantization applied to the transform coefficients of the prediction error blocks is extracted from the encoded bit-stream and provided to control manager 260 via control line 217. The control manager, in turn, conveys this information to inverse quantizer 210 via control line 218. Inverse quantizer 210 inverse quantizes the quantized DCT coefficients representing the prediction error information for each block of the macroblock according to the control information and provides the now inverse quantized DCT coefficients to inverse DCT transformer 220. The inverse quantized DCT coefficients representing the prediction error information for each block are then inverse transformed in the inverse DCT transformer 220 to yield an array of reconstructed prediction error values for each block of the macroblock. The encoded motion vector information associated with the macroblock is extracted from the encoded video bit-stream 135 by video multiplex decoder 270 and is decoded. The decoded motion vector information thus obtained is passed via control line 225 to motion compensated prediction block 240, which reconstructs a motion vector for the macroblock using the same motion model as that used to encode the INTER-coded macroblock in encoder 100. The reconstructed motion vector approximates the motion vector originally determined by motion estimation block 130 of the encoder. The motion compensated prediction block 240 of the decoder uses the reconstructed motion vector to identify the location of a region of reconstructed pixels in a prediction reference frame stored in frame store 250. The reference frame may be, for example, a previously decoded INTRA-coded frame, or a previously decoded INTER-coded frame. In either case, the region of pixels indicated by the reconstructed motion vector is used to form a prediction for the macroblock in question. More specifically, the motion compensated prediction block 240 forms an array of pixel values for each block of the macroblock by copying corresponding pixel values from the region of pixels identified by the motion vector. The prediction, that is the blocks of pixel values derived from the reference frame, are passed from motion compensated prediction block 240 to combiner 230 where they are combined with the decoded prediction error information. In practice, the pixel values of

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	each predicted block are added to corresponding reconstructed prediction error values output by inverse DCT transformer 220. In this way an array of reconstructed pixel values for each block of the macroblock is obtained. The reconstructed pixel values are passed to the video output 280 of the decoder and are also stored in frame store 250. As subsequent macroblocks of the INTER-coded frame are decoded and stored, a decoded frame is progressively assembled in the frame store 250 and thus becomes available for use as a reference frame for motion-compensated prediction of other INTER-coded frames. The '808 patent, 20:26-42: Operation of a video decoder 700 according to an embodiment of the invention will now be described with reference to FIG. 7. The structure of the video decoder illustrated in FIG. 7 is substantially identical to that of the prior art video decoder shown in FIG. 2, with appropriate modifications to those parts of the decoder that perform motion estimation operations. All parts of the video decoder which implement functions and operate in a manner identical to the previously described prior art video decoder are identified with identical reference numbers. It is further assumed that the video decoder of FIG. 7 corresponds to the encoder described in connection with FIG. 6 and is therefore capable of receiving and decoding the bit-stream 635 transmitted by encoder 600. Furthermore, as the present invention affects the decoding of video frames in INTER-coded format, description of the operations performed by decoder 700 in connection with the decoding of INTRA-coded frames will be omitted. The '808 patent, FIG. 2:

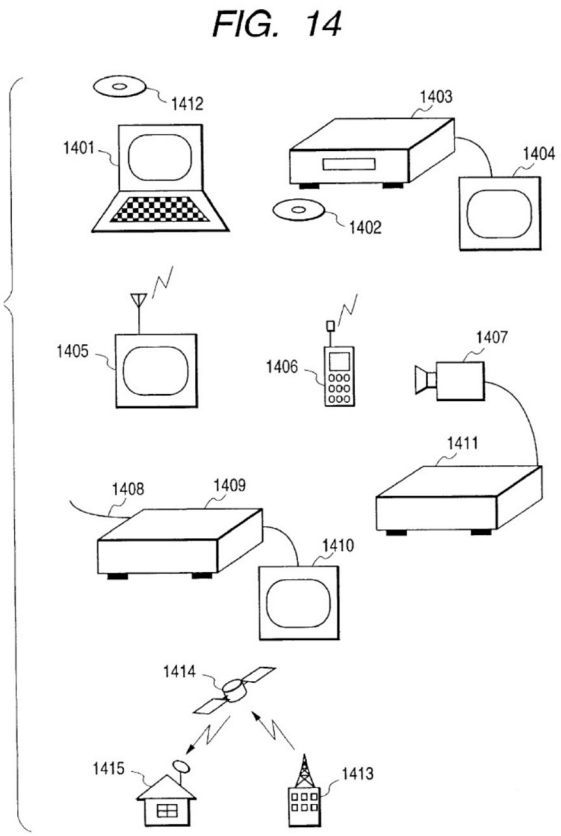
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	 Fig. 2 (PRIOR ART) Nakaya, 11:64-12:47: Specific examples of coders and decoders using the coding method described in this specification is shown in FIG. 14. The image coding and decoding method can be utilized by installing image coding and decoding software into a computer 1401. This software is recorded in some kind of storage media (CD-ROM, floppy disk, hard disk, etc.) 1412, loaded into a computer and then used. Additionally, the computer can be used as an image communication

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	terminal by connecting the computer to a communication lines. It is also possible to install the decoding method described in this specification into a player device 1403 that reads and decodes the coded bit stream recorded in a storage media 1402. In this case, the reconstructed image signal can be displayed on a television monitor 1404. The device 1403 can be used only for reading the coded bit stream, and in this case, the decoding device can be installed in the television monitor 1404. It is well known that digital data transmission can be realized using satellites and terrestrial waves. A decoding device can also be installed in a television receiver 1405 capable of receiving such digital transmissions. Also, a decoding device can also be installed inside a set top box 1409 connected to a satellite/terrestrial wave antenna, or a cable 1408 of a cable television system, so that the reconstructed images can be displayed on a television monitor 1410. In this case, the decoding device can be incorporated in the television monitor rather than in the set top box, as in the case of 1404. The layout of a digital satellite broadcast system is shown in 1413, 1414 and 1415. The video information in the coded bit stream is transmitted from a broadcast station 1413 to a communication or broadcast satellite 1414. The satellite receives this information, sends it to a home 1415 having equipment for receiving satellite broadcast programs, and the video information is reconstructed and displayed in this home using devices such as a television receiver or a set top box. Digital image communication using mobile terminals 1406 has recently attracted considerable attention, due to the fact that image communication at very low bit rates has become possible. Digital portable terminals can be categorized in the following three types: a transceiver having both an encoder and decoder; a transmitter having only an encoder; and a receiver having only a decoder. An encoding device can be installed in a video camera recorder 1407. The camera can also be used just for capturing the video signal and this signal can be supplied to a custom encoder 1411. All of the devices or systems shown in this drawing can be equipped with the coding or/and decoding method described in this specification. By using this coding or/and decoding method in these devices or systems, images of higher quality compared with those obtained using conventional technologies can be obtained.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	Nakaya, Fig. 14: 

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	Sugahara, 2:11-32. "With predictive encoding, the motion compensated prediction section 1 successively shifts the input macroblock with respect to the reference picture, within a predetermined search range, to determine whether there is a 16×16 array of pixels within the reference picture which has at least a predetermined minimum degree of correlation with the input macroblock. If such a condition is detected, then the amount and direction of displacement between that 16×16 pixel array in the reference picture and the input macroblock is obtained, as a vector value referred to as a motion vector (specifically, a combination of a horizontal and a vertical motion vector). The respective values of difference between the pixel values (i.e., luminance and chrominance values) of the input macroblock and the correspond pixels within that 16×16 array of pixels in the reference picture (read out from the picture memory 11 and supplied via the motion compensated prediction section 1) are then derived by the adder 2, and supplied to the DCT transform section 3, with these values being referred to as motion compensated prediction error values in the following. Prediction from a preceding reference picture process is referred to as forward prediction, and from a succeeding reference picture is referred to as backward prediction." Sugahara, 7:2-15. "The method can be implemented such that each of the pictures for which prediction information is replaced is a B-picture, and the copy data set includes motion vector information indicating that an overall amount of picture motion of a B-picture with respect to a corresponding temporally preceding or succeeding reference picture is zero, and motion compensated prediction error information indicating that respective amounts of motion compensated prediction error for all macroblocks of the B-picture are zero. That is to say, all macroblocks of the B-picture are indicated as being skipped macroblocks, so that at the time of

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	decoding the MPEG data stream, that B-picture will be decoded as an identical copy of a corresponding reference picture." Sugahara, 13:1-8. "With a second mode of operation of this embodiment, referring to FIG. 6, in addition to such conversion of each B-picture, each P-picture 32 is also converted by the stream portion changeover section 25 such that all of the macroblocks become skipped macroblocks with forward prediction, i.e., the MPEG data of the P-picture 31 are re-encoded as code which expresses a copy of the preceding reference picture." Sugahara, 17:20-29. "For example, if the second mode of processing described above is modified such that each P-picture copy stream portion and B-picture copy stream portion specifies a picture as having a fixed non-zero motion vector in a fixed direction, and all of the P and B-pictures of a GOP are subjected to copy data replacement, then the result will be that the final displayed picture will be successively shifted across the display screen, in the direction of the motion vector, when that GOP is decoded and a resultant video signal generated." Sugahara, 19:15-20. "Each time step S10, S12 or S15 has been executed, operation returns to step S5 in which the counter n is incremented, and if n has not reached a value equal to the total number of columns of macroblocks constituting a picture (step S6, N), operation returns to step S2, to then select and process the next picture in the temporal sequence." Sugahara, 21:50-67.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	"wherein said stream is an MPEG compressed video data stream in which each of said reference pictures is an I-picture or a P-picture and each of said predictively encoded pictures is a P-picture or a B-picture, each of said pictures for which prediction information is replaced is a B-picture, and wherein said copy data set includes motion vector information indicating that an overall amount of picture motion of a B-picture with respect to a corresponding temporally preceding reference picture or with respect to a corresponding temporally succeeding reference picture is zero and motion compensated prediction error information indicating that respective amounts of motion compensated prediction error for all macroblocks of said B-picture are zero, to thereby specify all macroblocks of said B-picture as being skipped macroblocks."
7[b] assigning either a zero motion vector or a predicted non-zero motion vector for the skip coding mode for the first segment based at least in part on the motion information of a second segment neighboring the first segment; and	The below references, as evidence by the example citations, disclose assigning either a zero motion vector or a predicted non-zero motion vector for the skip coding mode for the first segment based at least in part on the motion information of a second segment neighboring the first segment. *See limitation 1[b].* *See, e.g.*, The '808 patent, 4:44-60: In order to illustrate the operation of a generic video coding system in greater detail, reference will now be made to the exemplary video encoder and video decoder illustrated in FIGS. 1 and 2 of the accompanying drawings. The video encoder 100 of FIG. 1 employs a combination of INTRA- and INTER-coding to produce a compressed (encoded) video bit-stream and decoder 200 of FIG. 2 is arranged to receive and decode the video bit-stream produced by encoder 100 in order to produce a reconstructed video sequence. Throughout the following description it

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	will be assumed that the luminance component of a macroblock comprises 16×16 pixels arranged as an array of 4, 8×8 blocks, and that the associated chrominance components are spatially sub-sampled by a factor of two in the horizontal and vertical directions to form 8×8 blocks, as depicted in FIG. 3. Extension of the description to other block sizes and other sub-sampling schemes will be apparent to those of ordinary skill in the art. The '808 patent, 8:19-10:22: Operation of the video decoder 200, shown in FIG. 2 will now be described. The decoder 200 comprises a video multiplex decoder 270, which receives an encoded video bit-stream 135 from the encoder 100 and demultiplexes it into its constituent parts, an inverse quantizer 210, an inverse DCT transformer 220, a motion compensated prediction block 240, a frame store 250, a combiner 230, a control manager 260, and an output 280. The control manager 260 controls the operation of the decoder 200 in response to whether an INTRA- or an INTER-coded frame is being decoded. An INTRA/INTER trigger control signal, which causes the decoder to switch between decoding modes is derived, for example, from picture type information associated with each compressed video frame received from the encoder. The INTRA/INTER trigger control signal is extracted from the encoded video bit-stream by the video multiplex decoder 270 and is passed to control manager 260 via control line 215. Decoding of an INTRA-coded frame is performed on a macroblock-by-macroblock basis, each macroblock being decoded substantially as soon as encoded information relating to it is received in the video bit-stream 135. The video multiplex decoder 270 separates the encoded information for the blocks of the macroblock from possible control information relating to the macroblock in question. The encoded information for each block of an INTRA-coded macroblock comprises variable length codewords representing the entropy coded level and run values for the non-zero quantized DCT coefficients of the block. The video multiplex decoder

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	270 decodes the variable length codewords using a variable length decoding method corresponding to the encoding method used in the encoder 100 and thereby recovers the level and run values. It then reconstructs the array of quantized transform coefficient values for each block of the macroblock and passes them to inverse quantizer 210. Any control information relating to the macroblock is also decoded in the video multiplex decoder 270 using an appropriate decoding method and is passed to control manager 260. In particular, information relating to the level of quantization applied to the transform coefficients is extracted from the encoded bit-stream by video multiplex decoder 270 and provided to control manager 260 via control line 217. The control manager, in turn, conveys this information to inverse quantizer 210 via control line 218. Inverse quantizer 210 inverse quantizes the quantized DCT coefficients for each block of the macroblock according to the control information and provides the now inverse quantized DCT coefficients to inverse DCT transformer 220. Inverse DCT transformer 220 performs an inverse DCT transform on the inverse quantized DCT coefficients for each block of the macroblock to form a decoded block of image information comprising reconstructed pixel values. The reconstructed pixel values for each block of the macroblock are passed via combiner 230 to the video output 280 of the decoder where, for example, they can be provided to a display device (not shown). The reconstructed pixel values for each block are also stored in frame store 250. Because motion-compensated prediction is not used in the encoding/decoding of INTRA coded macroblocks control manager 260 controls combiner 230 to pass each block of pixel values as such to the video output 280 and frame store 250. As subsequent macroblocks of the INTRA-coded frame are decoded and stored, a decoded frame is progressively assembled in the frame store 250 and thus becomes available for use as a reference frame for motion compensated prediction in connection with the decoding of subsequently received INTER-coded frames. INTER-coded frames are also decoded macroblock by macroblock, each INTER-coded macroblock being decoded substantially as soon as encoded information relating to it is received in the bit-stream 135. The video multiplex decoder 270 separates the encoded

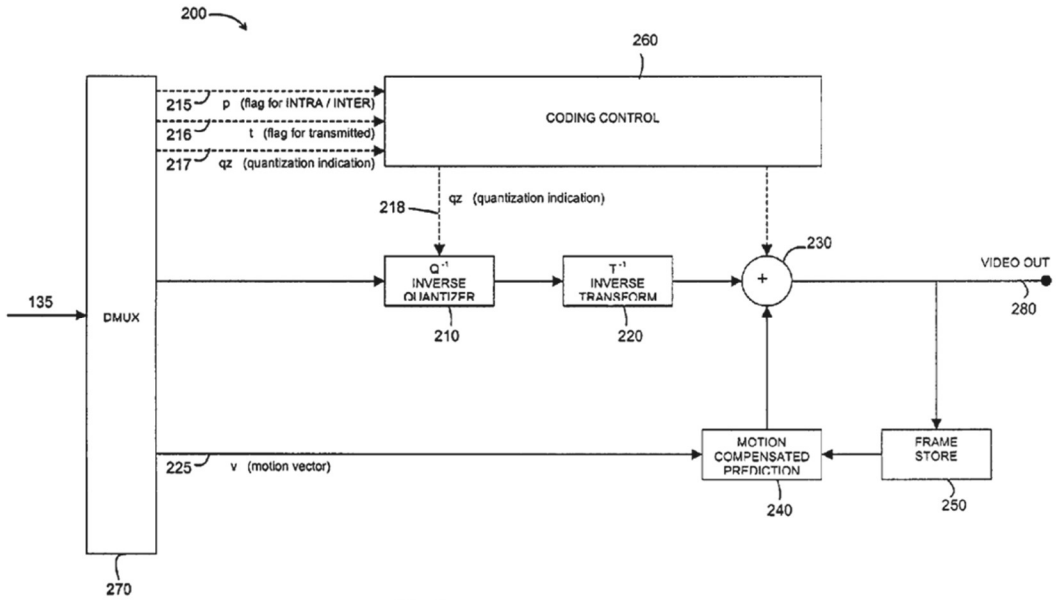
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	prediction error information for each block of an INTER-coded macroblock from encoded motion vector information and possible control information relating to the macroblock in question. As explained in the foregoing, the encoded prediction error information for each block of the macroblock comprises variable length codewords representing the entropy coded level and run values for the non-zero quantized transform coefficients of the prediction error block in question. The video multiplex decoder 270 decodes the variable length codewords using a variable length decoding method corresponding to the encoding method used in the encoder 100 and thereby recovers the level and run values. It then reconstructs an array of quantized transform coefficient values for each prediction error block and passes them to inverse quantizer 210. Control information relating to the INTER-coded macroblock is also decoded in the video multiplex decoder 270 using an appropriate decoding method and is passed to control manager 260. Information relating to the level of quantization applied to the transform coefficients of the prediction error blocks is extracted from the encoded bit-stream and provided to control manager 260 via control line 217. The control manager, in turn, conveys this information to inverse quantizer 210 via control line 218. Inverse quantizer 210 inverse quantizes the quantized DCT coefficients representing the prediction error information for each block of the macroblock according to the control information and provides the now inverse quantized DCT coefficients to inverse DCT transformer 220. The inverse quantized DCT coefficients representing the prediction error information for each block are then inverse transformed in the inverse DCT transformer 220 to yield an array of reconstructed prediction error values for each block of the macroblock. The encoded motion vector information associated with the macroblock is extracted from the encoded video bit-stream 135 by video multiplex decoder 270 and is decoded. The decoded motion vector information thus obtained is passed via control line 225 to motion compensated prediction block 240, which reconstructs a motion vector for the macroblock using the same motion model as that used to encode the INTER-coded macroblock in encoder 100. The reconstructed motion vector approximates the motion vector originally determined by motion

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	estimation block 130 of the encoder. The motion compensated prediction block 240 of the decoder uses the reconstructed motion vector to identify the location of a region of reconstructed pixels in a prediction reference frame stored in frame store 250. The reference frame may be, for example, a previously decoded INTRA-coded frame, or a previously decoded INTER-coded frame. In either case, the region of pixels indicated by the reconstructed motion vector is used to form a prediction for the macroblock in question. More specifically, the motion compensated prediction block 240 forms an array of pixel values for each block of the macroblock by copying corresponding pixel values from the region of pixels identified by the motion vector. The prediction, that is the blocks of pixel values derived from the reference frame, are passed from motion compensated prediction block 240 to combiner 230 where they are combined with the decoded prediction error information. In practice, the pixel values of each predicted block are added to corresponding reconstructed prediction error values output by inverse DCT transformer 220. In this way an array of reconstructed pixel values for each block of the macroblock is obtained. The reconstructed pixel values are passed to the video output 280 of the decoder and are also stored in frame store 250. As subsequent macroblocks of the INTER-coded frame are decoded and stored, a decoded frame is progressively assembled in the frame store 250 and thus becomes available for use as a reference frame for motion-compensated prediction of other INTER-coded frames. The ’808 patent, 20:26-42: Operation of a video decoder 700 according to an embodiment of the invention will now be described with reference to FIG. 7. The structure of the video decoder illustrated in FIG. 7 is substantially identical to that of the prior art video decoder shown in FIG. 2, with appropriate modifications to those parts of the decoder that perform motion estimation operations. All parts of the video decoder which implement functions and operate in a manner identical to the previously described prior art video decoder are identified with identical reference numbers. It is further assumed that the video decoder of FIG. 7 corresponds to the encoder described in connection with FIG. 6 and is therefore capable of receiving and decoding the bit-stream 635

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	transmitted by encoder 600. Furthermore, as the present invention affects the decoding of video frames in INTER-coded format, description of the operations performed by decoder 700 in connection with the decoding of INTRA-coded frames will be omitted. The '808 patent, FIG. 2:  Fig. 2 (PRIOR ART) H.263, § 6.1.1:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	6.1.1 Differential motion vectors The macroblock vector is obtained by adding predictors to the vector differences indicated by MVD (see Table 11). For differential coding with four vectors per macroblock, refer to Annex F. In case of one vector per macroblock, the candidate predictors for the differential coding are taken from three surrounding macroblocks as indicated in Figure 11. The predictors are calculated separately for the horizontal and vertical components. In the special cases at the borders of the current GOB or picture, the following decision rules are applied in increasing order: 1) When the corresponding macroblock was coded in INTRA mode (if not in PB-frames mode) or was not coded (COD = 1), the candidate predictor is set to zero. 2) The candidate predictor MV1 is set to zero if the corresponding macroblock is outside the picture (at the left side). 3) Then, the candidate predictors MV2 and MV3 are set to MV1 if the corresponding macroblocks are outside the picture (at the top) or outside the GOB (at the top) if the GOB header of the current GOB is non-empty. 4) Then, the candidate predictor MV3 is set to zero if the corresponding macroblock is outside the picture (at the right side). For each component, the predictor is the median value of the three candidate predictors for this component. Advantage is taken of the fact that the range of motion vector component values is constrained. Each VLC word for MVD represents a pair of difference values. Only one of the pair will yield a macroblock vector component falling within the permitted range [–16, 15.5]. A positive value of the horizontal or vertical component of the motion vector signifies that the prediction is formed from pixels in the previous picture which are spatially to the right or below the pixels being predicted. Kuriki, [0005-0006], [0026-0028]: In addition to the above-described series of operations, the encoding apparatus performs an operation of skipping the variable length encoding when the quantization block or the motion vector has the same value as that of the adjacent macroblock or the macroblock at the same

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	position in the previous or subsequent frame, which is referred to as a macroblock skip. Here, a macroblock that is skipped is referred to as a skipped macroblock. More specifically, in the case of a P picture, the encoding device performs the macroblock skip on a macroblock in which the quantization block is 0, that is, all the quantized DCT coefficients in the quantization block are 0 and the motion vector thereof is 0, and In the case of a B picture, the quantization block is 0, and the macroblock skip is performed for a macroblock whose motion vector is the same in magnitude and direction as the motion vector of the left adjacent macroblock of the current macroblock. However, the encoding apparatus sets the start and end of the slice to no macroblock skipping of the located macroblock is performed. … On the other hand, if it is determined in step 23 that the current macroblock is a B picture, the skip determination unit 120 calculates the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock, and determines whether or not the difference is equal to or smaller than the threshold value b (step 26). Here the previous the macro block means a macro block which is an encoding target immediately before the encoding target macro block. In a frame, it is usually a macroblock located on the left side of a macroblock to be encoded. Also, it is assumed that the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is calculated for each of the x component and the y component, and the skip determination unit 120 performs threshold determination for each of the x component and the y component of the difference. That is, the skip determination unit 120 determines whether both the x component and the y component of the difference are equal to or smaller than the threshold value b or whether one or both of the x component and the y component are larger than the threshold value b. It is assumed that the determination in step 26 includes that the direction of prediction (forward prediction, backward prediction, bidirectional prediction, or the like) is the same between the motion vector of the current macroblock and the motion vector of

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	the immediately preceding macroblock, that is, the reference frame is the same When it is determined in step 26 that both the x component and the y component of the difference are equal to or smaller than the threshold value b, the skip determination unit 120 determines that the macroblock is a skip macroblock (step 25). The skip determination unit 120 notifies the variable length coding unit 110, the motion vector replacement unit 121, and the addition unit 108 that the macroblock is determined to be a skip macroblock. In this way, in the case of a B picture, the skip determination unit 120 determines that the macroblock is a skip macroblock when the macroblock is not the first or last macroblock of the slice, the quantized block is 0, and the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is equal to or less than the threshold value b in both the x component and the y component. In the present embodiment, the threshold value b is 1.0. That is, when the skip determination unit 120 determines that both the x component and the y component of the motion vector difference between the current macroblock and the immediately preceding macroblock are equal to or smaller than 1.0, it determines that the current macroblock is a skip macroblock. If it is 1.0 or less, as in the case of the P picture, even if the coding of the macro block is omitted, the difference between the original image and the reproduced image is hardly noticeable to the human visual sense, so that there is substantially no problem. Note that the threshold value a and the threshold value b are not limited to 0.5 and 1.0, and, for example, the user may be allowed to set arbitrary values in the skip determination unit 120 within a range in which deterioration in image quality is allowable.
7[c] forming a prediction for the first segment with	The below references, as evidence by the example citations, disclose forming a prediction for the first segment with respect to a reference frame based at least in part on the assigned motion vector for the skip coding mode,

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
respect to a reference frame based at least in part on the assigned motion vector for the skip coding mode, wherein the assigned motion vector is one of the zero motion vector and the predicted non-zero motion vector.	wherein the assigned motion vector is one of the zero motion vector and the predicted non-zero motion vector. *See limitation 1[c].* *See, e.g.*, The '808 patent, 4:44-60: In order to illustrate the operation of a generic video coding system in greater detail, reference will now be made to the exemplary video encoder and video decoder illustrated in FIGS. 1 and 2 of the accompanying drawings. The video encoder 100 of FIG. 1 employs a combination of INTRA- and INTER-coding to produce a compressed (encoded) video bit-stream and decoder 200 of FIG. 2 is arranged to receive and decode the video bit-stream produced by encoder 100 in order to produce a reconstructed video sequence. Throughout the following description it will be assumed that the luminance component of a macroblock comprises 16×16 pixels arranged as an array of 4, 8×8 blocks, and that the associated chrominance components are spatially sub-sampled by a factor of two in the horizontal and vertical directions to form 8×8 blocks, as depicted in FIG. 3. Extension of the description to other block sizes and other sub-sampling schemes will be apparent to those of ordinary skill in the art. The '808 patent, 8:19-10:22: Operation of the video decoder 200, shown in FIG. 2 will now be described. The decoder 200 comprises a video multiplex decoder 270, which receives an encoded video bit-stream 135 from the encoder 100 and demultiplexes it into its constituent parts, an inverse quantizer 210, an inverse DCT transformer 220, a motion compensated prediction block 240, a frame store 250, a combiner 230, a control manager 260, and an output 280.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	The control manager 260 controls the operation of the decoder 200 in response to whether an INTRA- or an INTER-coded frame is being decoded. An INTRA/INTER trigger control signal, which causes the decoder to switch between decoding modes is derived, for example, from picture type information associated with each compressed video frame received from the encoder. The INTRA/INTER trigger control signal is extracted from the encoded video bit-stream by the video multiplex decoder 270 and is passed to control manager 260 via control line 215. Decoding of an INTRA-coded frame is performed on a macroblock-by-macroblock basis, each macroblock being decoded substantially as soon as encoded information relating to it is received in the video bit-stream 135. The video multiplex decoder 270 separates the encoded information for the blocks of the macroblock from possible control information relating to the macroblock in question. The encoded information for each block of an INTRA-coded macroblock comprises variable length codewords representing the entropy coded level and run values for the non-zero quantized DCT coefficients of the block. The video multiplex decoder 270 decodes the variable length codewords using a variable length decoding method corresponding to the encoding method used in the encoder 100 and thereby recovers the level and run values. It then reconstructs the array of quantized transform coefficient values for each block of the macroblock and passes them to inverse quantizer 210. Any control information relating to the macroblock is also decoded in the video multiplex decoder 270 using an appropriate decoding method and is passed to control manager 260. In particular, information relating to the level of quantization applied to the transform coefficients is extracted from the encoded bit-stream by video multiplex decoder 270 and provided to control manager 260 via control line 217. The control manager, in turn, conveys this information to inverse quantizer 210 via control line 218. Inverse quantizer 210 inverse quantizes the quantized DCT coefficients for each block of the macroblock according to the control information and provides the now inverse quantized DCT coefficients to inverse DCT transformer 220.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	Inverse DCT transformer 220 performs an inverse DCT transform on the inverse quantized DCT coefficients for each block of the macroblock to form a decoded block of image information comprising reconstructed pixel values. The reconstructed pixel values for each block of the macroblock are passed via combiner 230 to the video output 280 of the decoder where, for example, they can be provided to a display device (not shown). The reconstructed pixel values for each block are also stored in frame store 250. Because motion-compensated prediction is not used in the encoding/decoding of INTRA coded macroblocks control manager 260 controls combiner 230 to pass each block of pixel values as such to the video output 280 and frame store 250. As subsequent macroblocks of the INTRA-coded frame are decoded and stored, a decoded frame is progressively assembled in the frame store 250 and thus becomes available for use as a reference frame for motion compensated prediction in connection with the decoding of subsequently received INTER-coded frames. INTER-coded frames are also decoded macroblock by macroblock, each INTER-coded macroblock being decoded substantially as soon as encoded information relating to it is received in the bit-stream 135. The video multiplex decoder 270 separates the encoded prediction error information for each block of an INTER-coded macroblock from encoded motion vector information and possible control information relating to the macroblock in question. As explained in the foregoing, the encoded prediction error information for each block of the macroblock comprises variable length codewords representing the entropy coded level and run values for the non-zero quantized transform coefficients of the prediction error block in question. The video multiplex decoder 270 decodes the variable length codewords using a variable length decoding method corresponding to the encoding method used in the encoder 100 and thereby recovers the level and run values. It then reconstructs an array of quantized transform coefficient values for each prediction error block and passes them to inverse quantizer 210. Control information relating to the INTER-coded macroblock is also decoded in the video multiplex decoder 270 using an appropriate decoding method and is passed to control manager 260. Information relating to the level of quantization applied to the

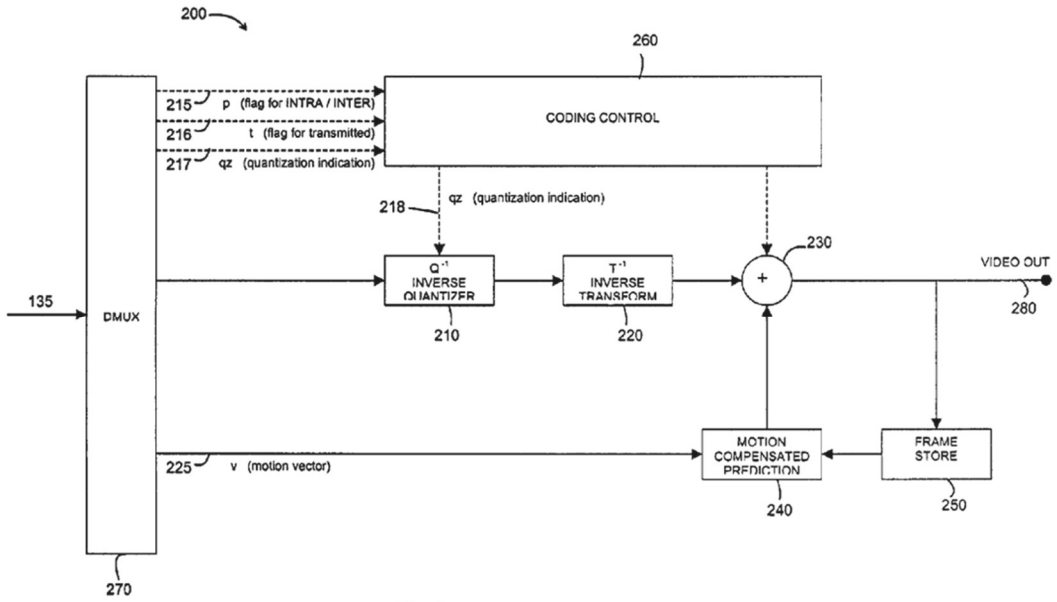
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	transform coefficients of the prediction error blocks is extracted from the encoded bit-stream and provided to control manager 260 via control line 217. The control manager, in turn, conveys this information to inverse quantizer 210 via control line 218. Inverse quantizer 210 inverse quantizes the quantized DCT coefficients representing the prediction error information for each block of the macroblock according to the control information and provides the now inverse quantized DCT coefficients to inverse DCT transformer 220. The inverse quantized DCT coefficients representing the prediction error information for each block are then inverse transformed in the inverse DCT transformer 220 to yield an array of reconstructed prediction error values for each block of the macroblock. The encoded motion vector information associated with the macroblock is extracted from the encoded video bit-stream 135 by video multiplex decoder 270 and is decoded. The decoded motion vector information thus obtained is passed via control line 225 to motion compensated prediction block 240, which reconstructs a motion vector for the macroblock using the same motion model as that used to encode the INTER-coded macroblock in encoder 100. The reconstructed motion vector approximates the motion vector originally determined by motion estimation block 130 of the encoder. The motion compensated prediction block 240 of the decoder uses the reconstructed motion vector to identify the location of a region of reconstructed pixels in a prediction reference frame stored in frame store 250. The reference frame may be, for example, a previously decoded INTRA-coded frame, or a previously decoded INTER-coded frame. In either case, the region of pixels indicated by the reconstructed motion vector is used to form a prediction for the macroblock in question. More specifically, the motion compensated prediction block 240 forms an array of pixel values for each block of the macroblock by copying corresponding pixel values from the region of pixels identified by the motion vector. The prediction, that is the blocks of pixel values derived from the reference frame, are passed from motion compensated prediction block 240 to combiner 230 where they are combined with the decoded prediction error information. In practice, the pixel values of each predicted block are added to corresponding reconstructed prediction error values output by

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	inverse DCT transformer 220. In this way an array of reconstructed pixel values for each block of the macroblock is obtained. The reconstructed pixel values are passed to the video output 280 of the decoder and are also stored in frame store 250. As subsequent macroblocks of the INTER-coded frame are decoded and stored, a decoded frame is progressively assembled in the frame store 250 and thus becomes available for use as a reference frame for motion-compensated prediction of other INTER-coded frames. The '808 patent, 20:26-42: Operation of a video decoder 700 according to an embodiment of the invention will now be described with reference to FIG. 7. The structure of the video decoder illustrated in FIG. 7 is substantially identical to that of the prior art video decoder shown in FIG. 2, with appropriate modifications to those parts of the decoder that perform motion estimation operations. All parts of the video decoder which implement functions and operate in a manner identical to the previously described prior art video decoder are identified with identical reference numbers. It is further assumed that the video decoder of FIG. 7 corresponds to the encoder described in connection with FIG. 6 and is therefore capable of receiving and decoding the bit-stream 635 transmitted by encoder 600. Furthermore, as the present invention affects the decoding of video frames in INTER-coded format, description of the operations performed by decoder 700 in connection with the decoding of INTRA-coded frames will be omitted. The '808 patent, FIG. 2:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	 Fig. 2 (PRIOR ART) Kuriki, [0002], [0004], [0008]: [Prior art] An encoding apparatus for compression-encoding moving image data by the MPEG method compresses moving image data by performing inter-frame prediction by motion compensation (hereinafter, referred to as motion compensated prediction). The frame of the past of a frame, or the future (or the both) to which an object block belongs with motion compensation prediction about the block (it is hereafter called an object block) of the coding subject in a video data (hereinafter, referred to as a reference frame), and obtains a difference

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	(hereinafter, referred to as a prediction error) of each pixel between the target block and the reference block, and a motion vector indicating a relative positional relationship between both blocks. Typically, motion compensated prediction is performed on a macroblock basis. … Here, the encoding type will be described. There are three kinds of encoding types, i.e., I picture, P picture, and B picture, and any one of the three kinds of encoding types is determined for each frame, and each frame is encoded by a different encoding method according to the encoding type. In a frame of an I picture, a luminance signal and two color difference signals of a macro block are subjected to DCT, quantization and variable length coding without performing motion compensation prediction. The I-picture frame serves as a reference frame of a frame of another encoding type. A frame of a P picture is motion-compensated and predicted using a frame of a past I picture or P picture as a reference frame, and a prediction error after the motion-compensated prediction is subjected to DCT, quantization, and variable length coding. The frame of the P picture serves as a reference frame of a macroblock of another P picture or B picture. The encoding method of the P picture is called unidirectional prediction. The frame of the B picture is motion-compensated and predicted using the frame of the past or future (or both) I picture or P picture as a reference frame, and the resulting prediction error is subjected to DCT, quantization, and variable length coding. It does not become a reference frame for other frames. The B-picture encoding method is called bidirectional prediction because it is predicted from both the past and future directions …. When a decoding device for decoding moving image data detects that there is a skip macroblock from an address of a macroblock, the decoding device performs: The P picture is decoded by using a block at the same position as the skip macro block in the reference frame of the picture, and the B picture is decoded by using the motion vector of the left adjacent macro

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	block. Lee, 63-64: Thus inter coding can be performed according to one of the following 15 modes of operation: SKIP: The current MB is replaced by the MB at the same spatial location in the previous reconstructed picture. Encoding is performed by skipping the current MB and incrementing the MB address. This mode is designed for areas in the picture where little or no change relative to the previously reconstructed picture is detected. FR-PMV: One motion vector for the current MB is predicted and used as an estimate. Motion vector searching is not performed. As only motion compensation is required, the MB is encoded using the header and the motion vector bits. When motion vectors can be accurately predicted, this mode becomes a likely candidate. H.263, § 6.1.1:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	6.1.1 Differential motion vectors The macroblock vector is obtained by adding predictors to the vector differences indicated by MVD (see Table 11). For differential coding with four vectors per macroblock, refer to Annex F. In case of one vector per macroblock, the candidate predictors for the differential coding are taken from three surrounding macroblocks as indicated in Figure 11. The predictors are calculated separately for the horizontal and vertical components. In the special cases at the borders of the current GOB or picture, the following decision rules are applied in increasing order: 1) When the corresponding macroblock was coded in INTRA mode (if not in PB-frames mode) or was not coded (COD = 1), the candidate predictor is set to zero. 2) The candidate predictor MV1 is set to zero if the corresponding macroblock is outside the picture (at the left side). 3) Then, the candidate predictors MV2 and MV3 are set to MV1 if the corresponding macroblocks are outside the picture (at the top) or outside the GOB (at the top) if the GOB header of the current GOB is non-empty. 4) Then, the candidate predictor MV3 is set to zero if the corresponding macroblock is outside the picture (at the right side). For each component, the predictor is the median value of the three candidate predictors for this component. Advantage is taken of the fact that the range of motion vector component values is constrained. Each VLC word for MVD represents a pair of difference values. Only one of the pair will yield a macroblock vector component falling within the permitted range [–16, 15.5]. A positive value of the horizontal or vertical component of the motion vector signifies that the prediction is formed from pixels in the previous picture which are spatially to the right or below the pixels being predicted. Kuriki, [0005-0006], [0026-0028]: In addition to the above-described series of operations, the encoding apparatus performs an operation of skipping the variable length encoding when the quantization block or the motion vector has the same value as that of the adjacent macroblock or the macroblock at the same

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	position in the previous or subsequent frame, which is referred to as a macroblock skip. Here, a macroblock that is skipped is referred to as a skipped macroblock. More specifically, in the case of a P picture, the encoding device performs the macroblock skip on a macroblock in which the quantization block is 0, that is, all the quantized DCT coefficients in the quantization block are 0 and the motion vector thereof is 0, and In the case of a B picture, the quantization block is 0, and the macroblock skip is performed for a macroblock whose motion vector is the same in magnitude and direction as the motion vector of the left adjacent macroblock of the current macroblock. However, the encoding apparatus sets the start and end of the slice to no macroblock skipping of the located macroblock is performed. … On the other hand, if it is determined in step 23 that the current macroblock is a B picture, the skip determination unit 120 calculates the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock, and determines whether or not the difference is equal to or smaller than the threshold value b (step 26). Here the previous the macro block means a macro block which is an encoding target immediately before the encoding target macro block. In a frame, it is usually a macroblock located on the left side of a macroblock to be encoded. Also, it is assumed that the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is calculated for each of the x component and the y component, and the skip determination unit 120 performs threshold determination for each of the x component and the y component of the difference. That is, the skip determination unit 120 determines whether both the x component and the y component of the difference are equal to or smaller than the threshold value b or whether one or both of the x component and the y component are larger than the threshold value b. It is assumed that the determination in step 26 includes that the direction of prediction (forward prediction, backward prediction, bidirectional prediction, or the like) is the same between the motion vector of the current macroblock and the motion vector of

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	the immediately preceding macroblock, that is, the reference frame is the same When it is determined in step 26 that both the x component and the y component of the difference are equal to or smaller than the threshold value b, the skip determination unit 120 determines that the macroblock is a skip macroblock (step 25). The skip determination unit 120 notifies the variable length coding unit 110, the motion vector replacement unit 121, and the addition unit 108 that the macroblock is determined to be a skip macroblock. In this way, in the case of a B picture, the skip determination unit 120 determines that the macroblock is a skip macroblock when the macroblock is not the first or last macroblock of the slice, the quantized block is 0, and the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is equal to or less than the threshold value b in both the x component and the y component. In the present embodiment, the threshold value b is 1.0. That is, when the skip determination unit 120 determines that both the x component and the y component of the motion vector difference between the current macroblock and the immediately preceding macroblock are equal to or smaller than 1.0, it determines that the current macroblock is a skip macroblock. If it is 1.0 or less, as in the case of the P picture, even if the coding of the macro block is omitted, the difference between the original image and the reproduced image is hardly noticeable to the human visual sense, so that there is substantially no problem. Note that the threshold value a and the threshold value b are not limited to 0.5 and 1.0, and, for example, the user may be allowed to set arbitrary values in the skip determination unit 120 within a range in which deterioration in image quality is allowable.
9. A method according to claim 7, wherein if a segment	Reference], as evidenced by the example citations below, discloses that if a segment in a previously decoded region surrounding the first segment has zero motion vector, the zero-motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
in a previously decoded region surrounding the first segment has zero motion vector, the zero-motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector.	corresponding segment of the reference frame associated with the zero motion vector. *See, e.g.,* *See claim 6.*
10[preamble] A video encoder for encoding a video sequence, the encoder comprises:	The below references, as evidence by the example citations, disclose a video encoder for encoding a video sequence. *See limitation 1[preamble].* *See, e.g.*, The '808 patent, 4:44-60: > In order to illustrate the operation of a generic video coding system in greater detail, reference will now be made to the exemplary video encoder and video decoder illustrated in FIGS. 1 and 2 of the accompanying drawings. The video encoder 100 of FIG. 1 employs a combination of

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	INTRA- and INTER-coding to produce a compressed (encoded) video bit-stream and decoder 200 of FIG. 2 is arranged to receive and decode the video bit-stream produced by encoder 100 in order to produce a reconstructed video sequence. Throughout the following description it will be assumed that the luminance component of a macroblock comprises 16×16 pixels arranged as an array of 4, 8×8 blocks, and that the associated chrominance components are spatially sub-sampled by a factor of two in the horizontal and vertical directions to form 8×8 blocks, as depicted in FIG. 3. Extension of the description to other block sizes and other sub-sampling schemes will be apparent to those of ordinary skill in the art. The '808 patent, 3:61-8:18 The video encoder 100 comprises an input 101 for receiving a digital video signal from a camera or other video source (not shown). It also comprises a transformation unit 104 which is arranged to perform a block-based discrete cosine transform (DCT), a quantizer 106, an inverse quantizer 108, an inverse transformation unit 110, arranged to perform an inverse block-based discrete cosine transform (IDCT), combiners 112 and 116, and a frame store 120. The encoder further comprises a motion estimator 130, a motion field coder 140 and a motion compensated predictor 150. Switches 102 and 114 are operated co-operatively by control manager 160 to switch the encoder between an INTRA-mode of video encoding and an INTER-mode of video encoding. The encoder 100 also comprises a video multiplex coder 170 which forms a single bit-stream from the various types of information produced by the encoder 100 for further transmission to a remote receiving terminal or, for example, for storage on a mass storage medium, such as a computer hard drive (not shown). Encoder 100 operates as follows. Each frame of uncompressed video provided from the video source to input 101 is received and processed macroblock by macroblock, preferably in raster-scan order. When the encoding of a new video sequence starts, the first frame to be encoded is encoded as an INTRA-coded frame. Subsequently, the encoder is programmed to code each frame in INTER-coded format, unless one of the following conditions is met: 1) it is judged

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	that the current macroblock of the frame being coded is so dissimilar from the pixel values in the reference frame used in its prediction that excessive prediction error information is produced, in which case the current macroblock is coded in INTRA-coded format; 2) a predefined INTRA frame repetition interval has expired; or 3) feedback is received from a receiving terminal indicating a request for a frame to be provided in INTRA-coded format. The occurrence of condition 1) is detected by monitoring the output of the combiner 116. The combiner 116 forms a difference between the current macroblock of the frame being coded and its prediction, produced in the motion compensated prediction block 150. If a measure of this difference (for example a sum of absolute differences of pixel values) exceeds a predetermined threshold, the combiner 116 informs the control manager 160 via a control line 119 and the control manager 160 operates the switches 102 and 114 via control line 113 so as to switch the encoder 100 into INTRA-coding mode. In this way, a frame which is otherwise encoded in INTER-coded format may comprise INTRA-coded macroblocks. Occurrence of condition 2) is monitored by means of a timer or frame counter implemented in the control manager 160, in such a way that if the timer expires, or the frame counter reaches a predetermined number of frames, the control manager 160 operates the switches 102 and 114 via control line 113 to switch the encoder into INTRA-coding mode. Condition 3) is triggered if the control manager 160 receives a feedback signal from, for example, a receiving terminal, via control line 121 indicating that an INTRA frame refresh is required by the receiving terminal. Such a condition may arise, for example, if a previously transmitted frame is badly corrupted by interference during its transmission, rendering it impossible to decode at the receiver. In this situation, the receiving decoder issues a request for the next frame to be encoded in INTRA-coded format, thus re-initialising the coding sequence. Operation of the encoder 100 in INTRA-coding mode will now be described. In INTRA-coding mode, the control manager 160 operates the switch 102 to accept video input from input line 118. The video signal input is received macroblock by macroblock from input 101 via the input line 118. As they are received, the blocks of luminance and chrominance values which make up

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	the macroblock are passed to the DCT transformation block 104, which performs a 2-dimensional discrete cosine transform on each block of values, producing a 2-dimensional array of DCT coefficients for each block. DCT transformation block 104 produces an array of coefficient values for each block, the number of coefficient values corresponding to the dimensions of the blocks which make up the macroblock (in this case 8×8). The DCT coefficients for each block are passed to the quantizer 106, where they are quantized using a quantization parameter QP. Selection of the quantization parameter QP is controlled by the control manager 160 via control line 115. The array of quantized DCT coefficients for each block is then passed from the quantizer 106 to the video multiplex coder 170, as indicated by line 125 in FIG. 1. The video multiplex coder 170 orders the quantized transform coefficients for each block using a zigzag scanning procedure, thereby converting the two-dimensional array of quantized transform coefficients into a one-dimensional array. Each non-zero valued quantized coefficient in the one dimensional array is then represented as a pair of values, referred to as level and run, where level is the value of the quantized coefficient and run is the number of consecutive zero-valued coefficients preceding the coefficient in question. The run and level values are further compressed in the video multiplex coder 170 using entropy coding, for example, variable length coding (VLC), or arithmetic coding. Once the run and level values have been entropy coded using an appropriate method, the video multiplex coder 170 further combines them with control information, also entropy coded using a method appropriate for the kind of information in question, to form a single compressed bit-stream of coded image information 135. It should be noted that while entropy coding has been described in connection with operations performed by the video multiplex coder 170, in alternative implementations a separate entropy coding unit may be provided. A locally decoded version of the macroblock is also formed in the encoder 100. This is done by passing the quantized transform coefficients for each block, output by quantizer 106, through

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	inverse quantizer 108 and applying an inverse DCT transform in inverse transformation block 110. In this way a reconstructed array of pixel values is constructed for each block of the macroblock. The resulting decoded image data is input to combiner 112. In INTRA-coding mode, switch 114 is set so that the input to the combiner 112 via switch 114 is zero. In this way, the operation performed by combiner 112 is equivalent to passing the decoded image data unaltered. As subsequent macroblocks of the current frame are received and undergo the previously described encoding and local decoding steps in blocks 104, 106, 108, 110 and 112, a decoded version of the INTRA-coded frame is built up in frame store 120. When the last macroblock of the current frame has been INTRA-coded and subsequently decoded, the frame store 120 contains a completely decoded frame, available for use as a motion prediction reference frame in coding a subsequently received video frame in INTER-coded format. Operation of the encoder 100 in INTER-coding mode will now be described. In INTER-coding mode, the control manager 160 operates switch 102 to receive its input from line 117, which comprises the output of combiner 116. The combiner 116 receives the video input signal macroblock by macroblock from input 101. As combiner 116 receives the blocks of luminance and chrominance values which make up the macroblock, it forms corresponding blocks of prediction error information. The prediction error information represents the difference between the block in question and its prediction, produced in motion compensated prediction block 150. More specifically, the prediction error information for each block of the macroblock comprises a two-dimensional array of values, each of which represents the difference between a pixel value in the block of luminance or chrominance information being coded and a decoded pixel value obtained by forming a motion-compensated prediction for the block, according to the procedure to be described below. Thus, in the exemplary video coding system considered here where each macroblock comprises, for example, an assembly of 8×8 blocks comprising luminance and chrominance values, the prediction error information for each block of the

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	macroblock similarly comprises an 8×8 array of prediction error values. The prediction error information for each block of the macroblock is passed to DCT transformation block 104, which performs a two-dimensional discrete cosine transform on each block of prediction error values to produce a two-dimensional array of DCT transform coefficients for each block. DCT transformation block 104 produces an array of coefficient values for each prediction error block, the number of coefficient values corresponding to the dimensions of the blocks which make up the macroblock (in this case 8×8). The transform coefficients derived from each prediction error block are passed to quantizer 106 where they are quantized using a quantization parameter QP, in a manner analogous to that described above in connection with operation of the encoder in INTRA-coding mode. As before, selection of the quantization parameter QP is controlled by the control manager 160 via control line 115. The quantized DCT coefficients representing the prediction error information for each block of the macroblock are passed from quantizer 106 to video multiplex coder 170, as indicated by line 125 in FIG. 1. As in INTRA-coding mode, the video multiplex coder 170 orders the transform coefficients for each prediction error block using a certain zigzag scanning procedure and then represents each non-zero valued quantized coefficient as a run-level pair. It further compresses the run-level pairs using entropy coding, in a manner analogous to that described above in connection with INTRA-coding mode. Video multiplex coder 170 also receives motion vector information (described in the following) from motion field coding block 140 via line 126 and control information from control manager 160. It entropy codes the motion vector information and control information and forms a single bit-stream of coded image information, 135 comprising the entropy coded motion vector, prediction error and control information. The quantized DCT coefficients representing the prediction error information for each block of the macroblock are also passed from quantizer 106 to inverse quantizer 108. Here they are inverse quantized and the resulting blocks of inverse quantized DCT coefficients are applied to

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	inverse DCT transform block 110, where they undergo inverse DCT transformation to produce locally decoded blocks of prediction error values. The locally decoded blocks of prediction error values are then input to combiner 112. In INTER-coding mode, switch 114 is set so that the combiner 112 also receives predicted pixel values for each block of the macroblock, generated by motion-compensated prediction block 150. The combiner 112 combines each of the locally decoded blocks of prediction error values with a corresponding block of predicted pixel values to produce reconstructed image blocks and stores them in frame store 120. As subsequent macroblocks of the video signal are received from the video source and undergo the previously described encoding and decoding steps in blocks 104, 106, 108, 110, 112, a decoded version of the frame is built up in frame store 120. When the last macroblock of the frame has been processed, the frame store 120 contains a completely decoded frame, available for use as a motion prediction reference frame in encoding a subsequently received video frame in INTER-coded format. The details of the motion-compensated prediction performed by video encoder 100 will now be considered. Any frame encoded in INTER-coded format requires a reference frame for motion-compensated prediction. This means, necessarily, that when encoding a video sequence, the first frame to be encoded, whether it is the first frame in the sequence, or some other frame, must be encoded in INTRA-coded format. This, in turn, means that when the video encoder 100 is switched into INTER-coding mode by control manager 160, a complete reference frame, formed by locally decoding a previously encoded frame, is already available in the frame store 120 of the encoder. In general, the reference frame is formed by locally decoding either an INTRA-coded frame or an INTER-coded frame. In the following description it will be assumed that the encoder performs motion compensated prediction on a macroblock basis, i.e. a macroblock is the smallest element of a video frame

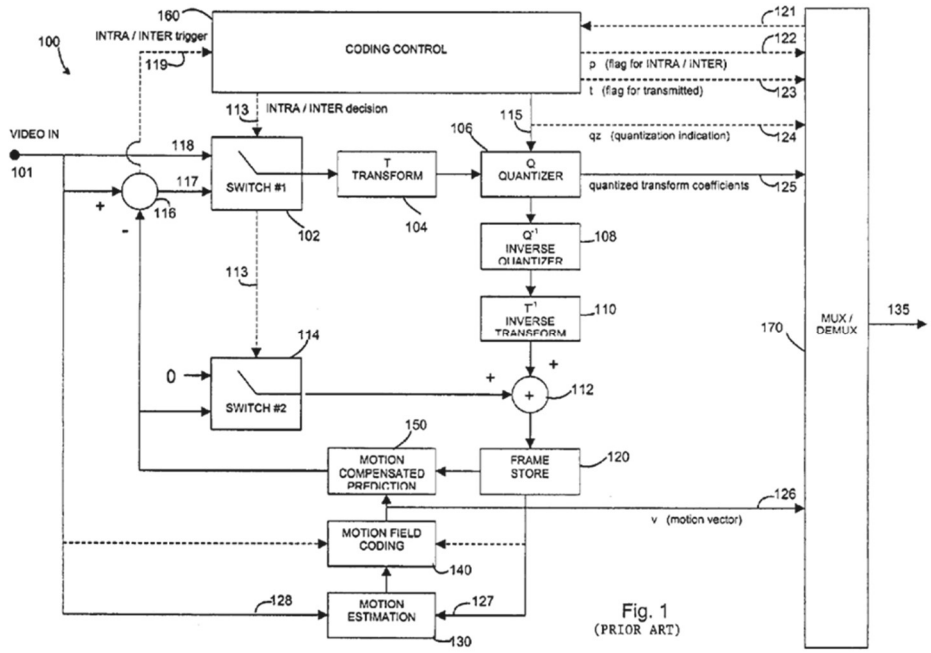
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	that can be associated with motion information. It will further be assumed that a prediction for a given macroblock is formed by identifying a region of 16×16 values in the luminance component of the reference frame that shows best correspondence with the 16×16 luminance values of the macroblock in question. Motion-compensated prediction in a video coding system where motion information may be associated with elements smaller than a macroblock will be considered later in the text. The first step in forming a prediction for a macroblock of the current frame is performed by motion estimation block 130. The motion estimation block 130 receives the blocks of luminance and chrominance values which make up the current macroblock of the frame to be coded via line 128. It then performs a block matching operation in order to identify a region in the reference frame that corresponds best with the current macroblock. In order to perform the block matching operation, motion estimation block 130 accesses reference frame data stored in frame store 120 via line 127. More specifically, motion estimation block 130 performs block-matching by calculating difference values (e.g. sums of absolute differences) representing the difference in pixel values between the macroblock under examination and candidate best-matching regions of pixels from a reference frame stored in the frame store 120. A difference value is produced for candidate regions at all possible offsets within a predefined search region of the reference frame and motion estimation block 130 determines the smallest calculated difference value. The candidate region that yields the smallest difference value is selected as the best-matching region. The offset between the current macroblock and the best-matching region identified in the reference frame defines a "motion vector" for the macroblock in question. The motion vector typically comprises a pair of numbers, one describing the horizontal (Δx) between the current macroblock and the best-matching region of the reference frame, the other representing the vertical displacement (Δy). Once the motion estimation block 130 has produced a motion vector for the macroblock, it outputs the motion vector to the motion field coding block 140. The motion field coding block 140 approximates the motion vector received from motion estimation block 130 using a motion

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	model comprising a set of basis functions and motion coefficients. More specifically, the motion field coding block 140 represents the motion vector as a set of motion coefficient values which, when multiplied by the basis functions, form an approximation of the motion vector. Typically, a translational motion model having only two motion coefficients and basis functions is used, but motion models of greater complexity may also be used. The motion coefficients are passed from motion field coding block 140 to motion compensated prediction block 150. Motion compensated prediction block 150 also receives the best-matching region of pixel values identified by motion estimation block 130 from frame store 120. Using the approximate representation of the motion vector generated by motion field coding block 140 and the pixel values of the best-matching region of pixels from the reference frame, motion compensated prediction block 150 generates an array of predicted pixel values for each block of the current macroblock. Each block of predicted pixel values is passed to combiner 116 where the predicted pixel values are subtracted from the actual (input) pixel values in the corresponding block of the current macroblock. In this way a set of prediction error blocks for the macroblock is obtained. The '808 patent, 16:1-14 FIG. 6 is a schematic block diagram of a video encoder 600 implemented according to an embodiment of the invention. When encoding frames of a digital video sequence, encoder 600 operates in a manner similar to that previously described in connection with the prior art video encoder of FIG. 1 to generate INTRA-coded and INTER-coded compressed video frames. The structure of the video encoder shown in FIG. 6 is substantially identical to that of the prior art video encoder shown in FIG. 1, with appropriate modifications to the motion estimation part necessary to implement the video encoding method according to the invention. All parts of the video encoder which implement functions and operate in a manner identical to the previously described prior art video encoder are identified with identical reference numbers.

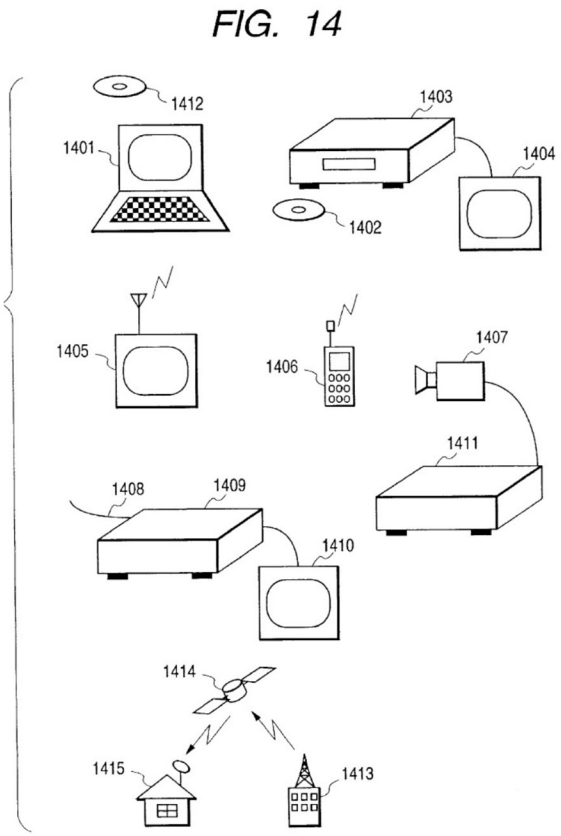
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	The ’808 patent, FIG. 1:  Fig. 1 (PRIOR ART) Nakaya, 11:64-12:47: Specific examples of coders and decoders using the coding method described in this specification is shown in FIG. 14. The image coding and decoding method can be utilized by installing image coding and decoding software into a computer 1401. This software is recorded in some kind of storage media (CD-ROM, floppy disk, hard disk, etc.) 1412, loaded into a computer and then used. Additionally, the computer can be used as an image communication

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	terminal by connecting the computer to a communication lines. It is also possible to install the decoding method described in this specification into a player device 1403 that reads and decodes the coded bit stream recorded in a storage media 1402. In this case, the reconstructed image signal can be displayed on a television monitor 1404. The device 1403 can be used only for reading the coded bit stream, and in this case, the decoding device can be installed in the television monitor 1404. It is well known that digital data transmission can be realized using satellites and terrestrial waves. A decoding device can also be installed in a television receiver 1405 capable of receiving such digital transmissions. Also, a decoding device can also be installed inside a set top box 1409 connected to a satellite/terrestrial wave antenna, or a cable 1408 of a cable television system, so that the reconstructed images can be displayed on a television monitor 1410. In this case, the decoding device can be incorporated in the television monitor rather than in the set top box, as in the case of 1404. The layout of a digital satellite broadcast system is shown in 1413, 1414 and 1415. The video information in the coded bit stream is transmitted from a broadcast station 1413 to a communication or broadcast satellite 1414. The satellite receives this information, sends it to a home 1415 having equipment for receiving satellite broadcast programs, and the video information is reconstructed and displayed in this home using devices such as a television receiver or a set top box. Digital image communication using mobile terminals 1406 has recently attracted considerable attention, due to the fact that image communication at very low bit rates has become possible. Digital portable terminals can be categorized in the following three types: a transceiver having both an encoder and decoder; a transmitter having only an encoder; and a receiver having only a decoder. An encoding device can be installed in a video camera recorder 1407. The camera can also be used just for capturing the video signal and this signal can be supplied to a custom encoder 1411. All of the devices or systems shown in this drawing can be equipped with the coding or/and decoding method described in this specification. By using this coding or/and decoding method in these devices or systems, images of higher quality compared with those obtained using conventional technologies can be obtained.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	Nakaya, Fig. 14: 

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	Hsieh, 995: In general moving scenes, motion objects often cover many small blocks such that the motion of the spatial neighbor blocks may be similar. In addition, due to the continuity of motion in temporal direction, the motion of the temporal neighbor blocks may be highly correlated. In other words, the motion vector of the current block can be predicted from that of the neighbor blocks in the temporal or spatial direction. H.263, § 5.3.1: A bit which when set to "0" signals that the macroblock is coded. If set to "1", no further information is transmitted for this macroblock; in that case the decoder shall treat the macroblock as an INTER macroblock with motion vector for the whole block equal to zero and with no coefficient data. COD is only present in pictures that are not of type "INTRA", for each macroblock in these pictures. NOTE – In Advanced Prediction mode (see Annex F), overlapped block motion compensation is also performed if COD is set to "1"; and in Deblocking Filter mode (see Annex J), the deblocking filter can also affect the values of some pixels of macroblocks having COD is set to "1".
10[a] a coding controller for assigning a skip coding mode to a first segment;	The below references, as evidence by the example citations, disclose a coding controller for assigning a skip coding mode to a first segment. *See limitation 1[a].*

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	See, e.g., The '808 patent, 4:44-60: > In order to illustrate the operation of a generic video coding system in greater detail, reference will now be made to the exemplary video encoder and video decoder illustrated in FIGS. 1 and 2 of the accompanying drawings. The video encoder 100 of FIG. 1 employs a combination of INTRA- and INTER-coding to produce a compressed (encoded) video bit-stream and decoder 200 of FIG. 2 is arranged to receive and decode the video bit-stream produced by encoder 100 in order to produce a reconstructed video sequence. Throughout the following description it will be assumed that the luminance component of a macroblock comprises 16×16 pixels arranged as an array of 4, 8×8 blocks, and that the associated chrominance components are spatially sub-sampled by a factor of two in the horizontal and vertical directions to form 8×8 blocks, as depicted in FIG. 3. Extension of the description to other block sizes and other sub-sampling schemes will be apparent to those of ordinary skill in the art. The '808 patent, 3:61-8:18 > The video encoder 100 comprises an input 101 for receiving a digital video signal from a camera or other video source (not shown). It also comprises a transformation unit 104 which is arranged to perform a block-based discrete cosine transform (DCT), a quantizer 106, an inverse quantizer 108, an inverse transformation unit 110, arranged to perform an inverse block-based discrete cosine transform (IDCT), combiners 112 and 116, and a frame store 120. The encoder further comprises a motion estimator 130, a motion field coder 140 and a motion compensated predictor 150. Switches 102 and 114 are operated co-operatively by control manager 160 to switch the encoder between an INTRA-mode of video encoding and an INTER-mode of video encoding. The encoder 100 also comprises a video multiplex coder 170 which forms a single bit-stream from the various types of information produced by the encoder 100 for further transmission to a remote receiving terminal or, for example, for storage on a mass storage

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	medium, such as a computer hard drive (not shown). Encoder 100 operates as follows. Each frame of uncompressed video provided from the video source to input 101 is received and processed macroblock by macroblock, preferably in raster-scan order. When the encoding of a new video sequence starts, the first frame to be encoded is encoded as an INTRA-coded frame. Subsequently, the encoder is programmed to code each frame in INTER-coded format, unless one of the following conditions is met: 1) it is judged that the current macroblock of the frame being coded is so dissimilar from the pixel values in the reference frame used in its prediction that excessive prediction error information is produced, in which case the current macroblock is coded in INTRA-coded format; 2) a predefined INTRA frame repetition interval has expired; or 3) feedback is received from a receiving terminal indicating a request for a frame to be provided in INTRA-coded format. The occurrence of condition 1) is detected by monitoring the output of the combiner 116. The combiner 116 forms a difference between the current macroblock of the frame being coded and its prediction, produced in the motion compensated prediction block 150. If a measure of this difference (for example a sum of absolute differences of pixel values) exceeds a predetermined threshold, the combiner 116 informs the control manager 160 via a control line 119 and the control manager 160 operates the switches 102 and 114 via control line 113 so as to switch the encoder 100 into INTRA-coding mode. In this way, a frame which is otherwise encoded in INTER-coded format may comprise INTRA-coded macroblocks. Occurrence of condition 2) is monitored by means of a timer or frame counter implemented in the control manager 160, in such a way that if the timer expires, or the frame counter reaches a predetermined number of frames, the control manager 160 operates the switches 102 and 114 via control line 113 to switch the encoder into INTRA-coding mode. Condition 3) is triggered if the control manager 160 receives a feedback signal from, for example, a receiving terminal, via control line 121 indicating that an INTRA frame refresh is required by the receiving terminal. Such a condition may arise, for example, if a previously transmitted frame is badly corrupted by interference during its transmission, rendering it impossible to decode at the receiver. In this situation, the

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	receiving decoder issues a request for the next frame to be encoded in INTRA-coded format, thus re-initialising the coding sequence. Operation of the encoder 100 in INTRA-coding mode will now be described. In INTRA-coding mode, the control manager 160 operates the switch 102 to accept video input from input line 118. The video signal input is received macroblock by macroblock from input 101 via the input line 118. As they are received, the blocks of luminance and chrominance values which make up the macroblock are passed to the DCT transformation block 104, which performs a 2-dimensional discrete cosine transform on each block of values, producing a 2-dimensional array of DCT coefficients for each block. DCT transformation block 104 produces an array of coefficient values for each block, the number of coefficient values corresponding to the dimensions of the blocks which make up the macroblock (in this case 8×8). The DCT coefficients for each block are passed to the quantizer 106, where they are quantized using a quantization parameter QP. Selection of the quantization parameter QP is controlled by the control manager 160 via control line 115. The array of quantized DCT coefficients for each block is then passed from the quantizer 106 to the video multiplex coder 170, as indicated by line 125 in FIG. 1. The video multiplex coder 170 orders the quantized transform coefficients for each block using a zigzag scanning procedure, thereby converting the two-dimensional array of quantized transform coefficients into a one-dimensional array. Each non-zero valued quantized coefficient in the one dimensional array is then represented as a pair of values, referred to as level and run, where level is the value of the quantized coefficient and run is the number of consecutive zero-valued coefficients preceding the coefficient in question. The run and level values are further compressed in the video multiplex coder 170 using entropy coding, for example, variable length coding (VLC), or arithmetic coding. Once the run and level values have been entropy coded using an appropriate method, the video multiplex coder 170 further combines them with control information, also entropy coded using

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	a method appropriate for the kind of information in question, to form a single compressed bit-stream of coded image information 135. It should be noted that while entropy coding has been described in connection with operations performed by the video multiplex coder 170, in alternative implementations a separate entropy coding unit may be provided. A locally decoded version of the macroblock is also formed in the encoder 100. This is done by passing the quantized transform coefficients for each block, output by quantizer 106, through inverse quantizer 108 and applying an inverse DCT transform in inverse transformation block 110. In this way a reconstructed array of pixel values is constructed for each block of the macroblock. The resulting decoded image data is input to combiner 112. In INTRA-coding mode, switch 114 is set so that the input to the combiner 112 via switch 114 is zero. In this way, the operation performed by combiner 112 is equivalent to passing the decoded image data unaltered. As subsequent macroblocks of the current frame are received and undergo the previously described encoding and local decoding steps in blocks 104, 106, 108, 110 and 112, a decoded version of the INTRA-coded frame is built up in frame store 120. When the last macroblock of the current frame has been INTRA-coded and subsequently decoded, the frame store 120 contains a completely decoded frame, available for use as a motion prediction reference frame in coding a subsequently received video frame in INTER-coded format. Operation of the encoder 100 in INTER-coding mode will now be described. In INTER-coding mode, the control manager 160 operates switch 102 to receive its input from line 117, which comprises the output of combiner 116. The combiner 116 receives the video input signal macroblock by macroblock from input 101. As combiner 116 receives the blocks of luminance and chrominance values which make up the macroblock, it forms corresponding blocks of prediction error information. The prediction error information represents the difference between the block in question and its prediction, produced in motion compensated prediction block 150. More specifically, the prediction error information for each block of the macroblock comprises

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	a two-dimensional array of values, each of which represents the difference between a pixel value in the block of luminance or chrominance information being coded and a decoded pixel value obtained by forming a motion-compensated prediction for the block, according to the procedure to be described below. Thus, in the exemplary video coding system considered here where each macroblock comprises, for example, an assembly of 8×8 blocks comprising luminance and chrominance values, the prediction error information for each block of the macroblock similarly comprises an 8×8 array of prediction error values. The prediction error information for each block of the macroblock is passed to DCT transformation block 104, which performs a two-dimensional discrete cosine transform on each block of prediction error values to produce a two-dimensional array of DCT transform coefficients for each block. DCT transformation block 104 produces an array of coefficient values for each prediction error block, the number of coefficient values corresponding to the dimensions of the blocks which make up the macroblock (in this case 8×8). The transform coefficients derived from each prediction error block are passed to quantizer 106 where they are quantized using a quantization parameter QP, in a manner analogous to that described above in connection with operation of the encoder in INTRA-coding mode. As before, selection of the quantization parameter QP is controlled by the control manager 160 via control line 115. The quantized DCT coefficients representing the prediction error information for each block of the macroblock are passed from quantizer 106 to video multiplex coder 170, as indicated by line 125 in FIG. 1. As in INTRA-coding mode, the video multiplex coder 170 orders the transform coefficients for each prediction error block using a certain zigzag scanning procedure and then represents each non-zero valued quantized coefficient as a run-level pair. It further compresses the run-level pairs using entropy coding, in a manner analogous to that described above in connection with INTRA-coding mode. Video multiplex coder 170 also receives motion vector information (described in the following) from motion field coding block 140 via line 126 and control information from control manager 160. It entropy codes the motion vector

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	information and control information and forms a single bit-stream of coded image information, 135 comprising the entropy coded motion vector, prediction error and control information. The quantized DCT coefficients representing the prediction error information for each block of the macroblock are also passed from quantizer 106 to inverse quantizer 108. Here they are inverse quantized and the resulting blocks of inverse quantized DCT coefficients are applied to inverse DCT transform block 110, where they undergo inverse DCT transformation to produce locally decoded blocks of prediction error values. The locally decoded blocks of prediction error values are then input to combiner 112. In INTER-coding mode, switch 114 is set so that the combiner 112 also receives predicted pixel values for each block of the macroblock, generated by motion-compensated prediction block 150. The combiner 112 combines each of the locally decoded blocks of prediction error values with a corresponding block of predicted pixel values to produce reconstructed image blocks and stores them in frame store 120. As subsequent macroblocks of the video signal are received from the video source and undergo the previously described encoding and decoding steps in blocks 104, 106, 108, 110, 112, a decoded version of the frame is built up in frame store 120. When the last macroblock of the frame has been processed, the frame store 120 contains a completely decoded frame, available for use as a motion prediction reference frame in encoding a subsequently received video frame in INTER-coded format. The details of the motion-compensated prediction performed by video encoder 100 will now be considered. Any frame encoded in INTER-coded format requires a reference frame for motion-compensated prediction. This means, necessarily, that when encoding a video sequence, the first frame to be encoded, whether it is the first frame in the sequence, or some other frame, must be encoded in INTRA-coded format. This, in turn, means that when the video encoder 100 is switched into INTER-coding mode by control manager 160, a complete reference frame,

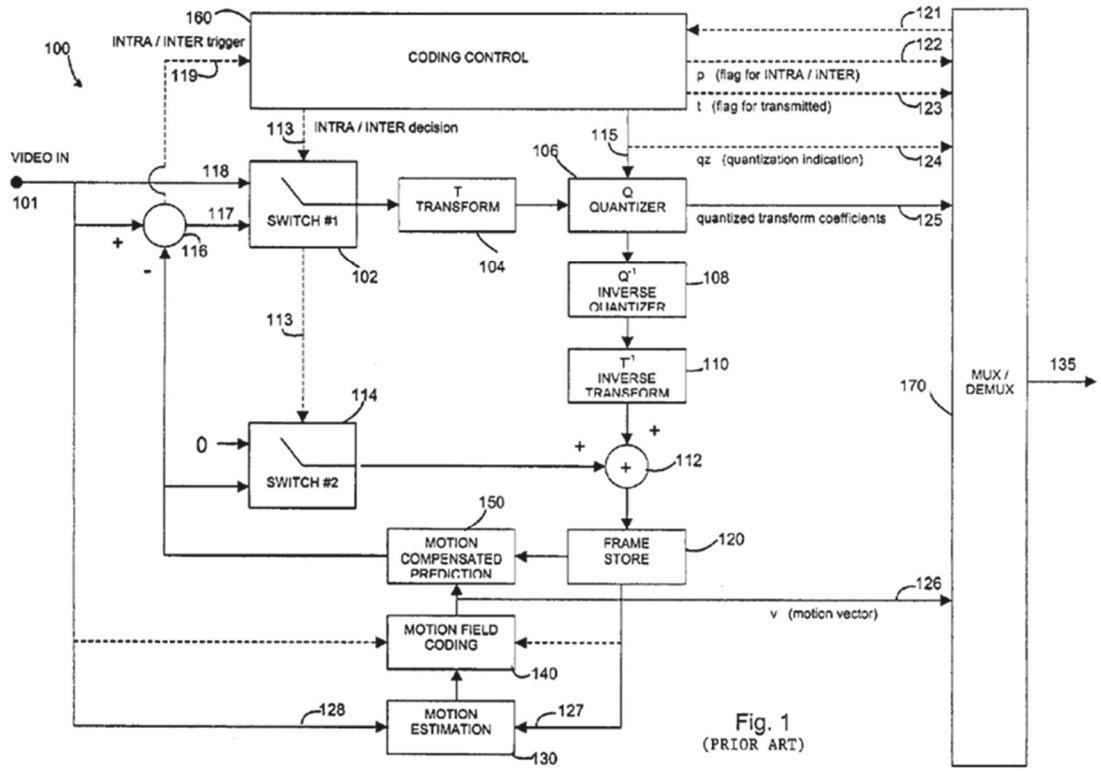
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	formed by locally decoding a previously encoded frame, is already available in the frame store 120 of the encoder. In general, the reference frame is formed by locally decoding either an INTRA-coded frame or an INTER-coded frame. In the following description it will be assumed that the encoder performs motion compensated prediction on a macroblock basis, i.e. a macroblock is the smallest element of a video frame that can be associated with motion information. It will further be assumed that a prediction for a given macroblock is formed by identifying a region of 16×16 values in the luminance component of the reference frame that shows best correspondence with the 16×16 luminance values of the macroblock in question. Motion-compensated prediction in a video coding system where motion information may be associated with elements smaller than a macroblock will be considered later in the text. The first step in forming a prediction for a macroblock of the current frame is performed by motion estimation block 130. The motion estimation block 130 receives the blocks of luminance and chrominance values which make up the current macroblock of the frame to be coded via line 128. It then performs a block matching operation in order to identify a region in the reference frame that corresponds best with the current macroblock. In order to perform the block matching operation, motion estimation block 130 accesses reference frame data stored in frame store 120 via line 127. More specifically, motion estimation block 130 performs block-matching by calculating difference values (e.g. sums of absolute differences) representing the difference in pixel values between the macroblock under examination and candidate best-matching regions of pixels from a reference frame stored in the frame store 120. A difference value is produced for candidate regions at all possible offsets within a predefined search region of the reference frame and motion estimation block 130 determines the smallest calculated difference value. The candidate region that yields the smallest difference value is selected as the best-matching region. The offset between the current macroblock and the best-matching region identified in the reference frame defines a "motion vector" for the macroblock in question. The motion vector typically comprises a pair of numbers, one describing the

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	horizontal (Δx) between the current macroblock and the best-matching region of the reference frame, the other representing the vertical displacement (Δy). Once the motion estimation block 130 has produced a motion vector for the macroblock, it outputs the motion vector to the motion field coding block 140. The motion field coding block 140 approximates the motion vector received from motion estimation block 130 using a motion model comprising a set of basis functions and motion coefficients. More specifically, the motion field coding block 140 represents the motion vector as a set of motion coefficient values which, when multiplied by the basis functions, form an approximation of the motion vector. Typically, a translational motion model having only two motion coefficients and basis functions is used, but motion models of greater complexity may also be used. The motion coefficients are passed from motion field coding block 140 to motion compensated prediction block 150. Motion compensated prediction block 150 also receives the best-matching region of pixel values identified by motion estimation block 130 from frame store 120. Using the approximate representation of the motion vector generated by motion field coding block 140 and the pixel values of the best-matching region of pixels from the reference frame, motion compensated prediction block 150 generates an array of predicted pixel values for each block of the current macroblock. Each block of predicted pixel values is passed to combiner 116 where the predicted pixel values are subtracted from the actual (input) pixel values in the corresponding block of the current macroblock. In this way a set of prediction error blocks for the macroblock is obtained. The ’808 patent, FIG. 1:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	 Fig. 1 (PRIOR ART)
10[b] a motion estimation block for assigning either a	The below references, as evidence by the example citations, disclose a motion estimation block for assigning either a zero motion vector or a predicted non-zero motion vector for the skip coding mode for the first segment

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
zero motion vector or a predicted non-zero motion vector for the skip coding mode for the first segment based at least in part on the motion information of a second segment neighboring the first segment; and	based at least in part on the motion information of a second segment neighboring the first segment. *See limitation 1[b].* *See, e.g.*, The '808 patent, 4:44-60: In order to illustrate the operation of a generic video coding system in greater detail, reference will now be made to the exemplary video encoder and video decoder illustrated in FIGS. 1 and 2 of the accompanying drawings. The video encoder 100 of FIG. 1 employs a combination of INTRA- and INTER-coding to produce a compressed (encoded) video bit-stream and decoder 200 of FIG. 2 is arranged to receive and decode the video bit-stream produced by encoder 100 in order to produce a reconstructed video sequence. Throughout the following description it will be assumed that the luminance component of a macroblock comprises 16×16 pixels arranged as an array of 4, 8×8 blocks, and that the associated chrominance components are spatially sub-sampled by a factor of two in the horizontal and vertical directions to form 8×8 blocks, as depicted in FIG. 3. Extension of the description to other block sizes and other sub-sampling schemes will be apparent to those of ordinary skill in the art. The '808 patent, 3:61-4:12 The video encoder 100 comprises an input 101 for receiving a digital video signal from a camera or other video source (not shown). It also comprises a transformation unit 104 which is arranged to perform a block-based discrete cosine transform (DCT), a quantizer 106, an inverse quantizer 108, an inverse transformation unit 110, arranged to perform an inverse block-based discrete cosine transform (IDCT), combiners 112 and 116, and a frame store 120. The encoder further comprises a motion estimator 130, a motion field coder 140 and a motion compensated predictor 150. Switches 102 and 114 are operated co-operatively by control manager 160 to

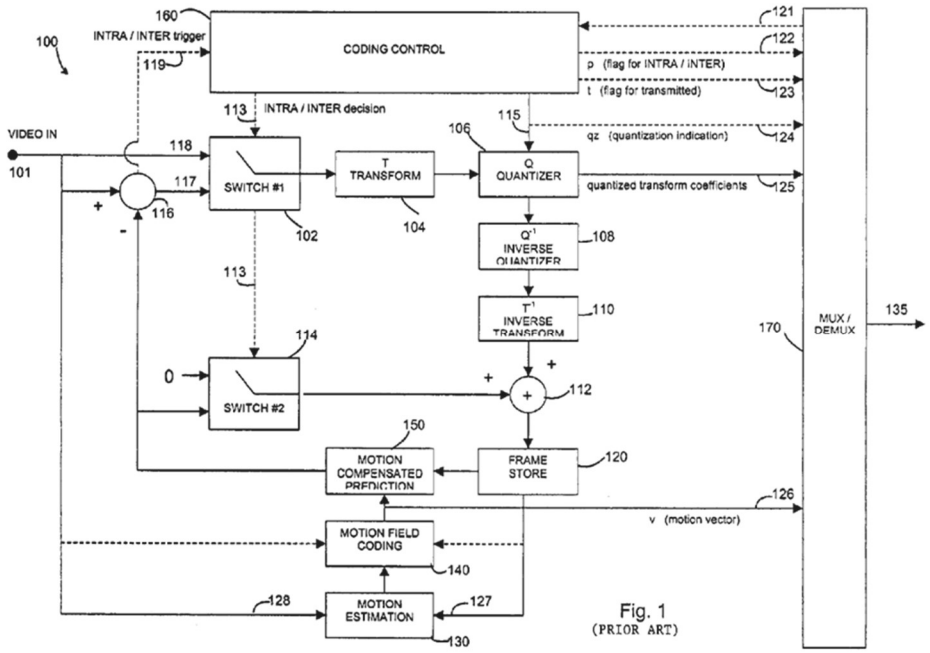
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	switch the encoder between an INTRA-mode of video encoding and an INTER-mode of video encoding. The encoder 100 also comprises a video multiplex coder 170 which forms a single bit-stream from the various types of information produced by the encoder 100 for further transmission to a remote receiving terminal or, for example, for storage on a mass storage medium, such as a computer hard drive (not shown). The '808 patent, 7:30-8:18: The first step in forming a prediction for a macroblock of the current frame is performed by motion estimation block 130. The motion estimation block 130 receives the blocks of luminance and chrominance values which make up the current macroblock of the frame to be coded via line 128. It then performs a block matching operation in order to identify a region in the reference frame that corresponds best with the current macroblock. In order to perform the block matching operation, motion estimation block 130 accesses reference frame data stored in frame store 120 via line 127. More specifically, motion estimation block 130 performs block-matching by calculating difference values (e.g. sums of absolute differences) representing the difference in pixel values between the macroblock under examination and candidate best-matching regions of pixels from a reference frame stored in the frame store 120. A difference value is produced for candidate regions at all possible offsets within a predefined search region of the reference frame and motion estimation block 130 determines the smallest calculated difference value. The candidate region that yields the smallest difference value is selected as the best-matching region. The offset between the current macroblock and the best-matching region identified in the reference frame defines a "motion vector" for the macroblock in question. The motion vector typically comprises a pair of numbers, one describing the horizontal (Δx) between the current macroblock and the best-matching region of the reference frame, the other representing the vertical displacement (Δy). Once the motion estimation block 130 has produced a motion vector for the macroblock, it outputs the motion vector to the motion field coding block 140. The motion field coding block

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	140 approximates the motion vector received from motion estimation block 130 using a motion model comprising a set of basis functions and motion coefficients. More specifically, the motion field coding block 140 represents the motion vector as a set of motion coefficient values which, when multiplied by the basis functions, form an approximation of the motion vector. Typically, a translational motion model having only two motion coefficients and basis functions is used, but motion models of greater complexity may also be used. The motion coefficients are passed from motion field coding block 140 to motion compensated prediction block 150. Motion compensated prediction block 150 also receives the best-matching region of pixel values identified by motion estimation block 130 from frame store 120. Using the approximate representation of the motion vector generated by motion field coding block 140 and the pixel values of the best-matching region of pixels from the reference frame, motion compensated prediction block 150 generates an array of predicted pixel values for each block of the current macroblock. Each block of predicted pixel values is passed to combiner 116 where the predicted pixel values are subtracted from the actual (input) pixel values in the corresponding block of the current macroblock. In this way a set of prediction error blocks for the macroblock is obtained. The '808 patent, 16:1-14: FIG. 6 is a schematic block diagram of a video encoder 600 implemented according to an embodiment of the invention. When encoding frames of a digital video sequence, encoder 600 operates in a manner similar to that previously described in connection with the prior art video encoder of FIG. 1 to generate INTRA-coded and INTER-coded compressed video frames. The structure of the video encoder shown in FIG. 6 is substantially identical to that of the prior art video encoder shown in FIG. 1, with appropriate modifications to the motion estimation part necessary to implement the video encoding method according to the invention. All parts of the video encoder which implement functions and operate in a manner identical to the previously described prior art video encoder are identified with identical reference numbers.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	The ’808 patent, FIG. 1:  Fig. 1 (PRIOR ART) H.263, § 6.1.1:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	6.1.1 Differential motion vectors The macroblock vector is obtained by adding predictors to the vector differences indicated by MVD (see Table 11). For differential coding with four vectors per macroblock, refer to Annex F. In case of one vector per macroblock, the candidate predictors for the differential coding are taken from three surrounding macroblocks as indicated in Figure 11. The predictors are calculated separately for the horizontal and vertical components. In the special cases at the borders of the current GOB or picture, the following decision rules are applied in increasing order: 1) When the corresponding macroblock was coded in INTRA mode (if not in PB-frames mode) or was not coded (COD = 1), the candidate predictor is set to zero. 2) The candidate predictor MV1 is set to zero if the corresponding macroblock is outside the picture (at the left side). 3) Then, the candidate predictors MV2 and MV3 are set to MV1 if the corresponding macroblocks are outside the picture (at the top) or outside the GOB (at the top) if the GOB header of the current GOB is non-empty. 4) Then, the candidate predictor MV3 is set to zero if the corresponding macroblock is outside the picture (at the right side). For each component, the predictor is the median value of the three candidate predictors for this component. Advantage is taken of the fact that the range of motion vector component values is constrained. Each VLC word for MVD represents a pair of difference values. Only one of the pair will yield a macroblock vector component falling within the permitted range [–16, 15.5]. A positive value of the horizontal or vertical component of the motion vector signifies that the prediction is formed from pixels in the previous picture which are spatially to the right or below the pixels being predicted. Kuriki, [0005-0006], [0026-0028]: In addition to the above-described series of operations, the encoding apparatus performs an operation of skipping the variable length encoding when the quantization block or the motion vector has the same value as that of the adjacent macroblock or the macroblock at the same

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	position in the previous or subsequent frame, which is referred to as a macroblock skip. Here, a macroblock that is skipped is referred to as a skipped macroblock. More specifically, in the case of a P picture, the encoding device performs the macroblock skip on a macroblock in which the quantization block is 0, that is, all the quantized DCT coefficients in the quantization block are 0 and the motion vector thereof is 0, and In the case of a B picture, the quantization block is 0, and the macroblock skip is performed for a macroblock whose motion vector is the same in magnitude and direction as the motion vector of the left adjacent macroblock of the current macroblock. However, the encoding apparatus sets the start and end of the slice to no macroblock skipping of the located macroblock is performed. … On the other hand, if it is determined in step 23 that the current macroblock is a B picture, the skip determination unit 120 calculates the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock, and determines whether or not the difference is equal to or smaller than the threshold value b (step 26). Here the previous the macro block means a macro block which is an encoding target immediately before the encoding target macro block. In a frame, it is usually a macroblock located on the left side of a macroblock to be encoded. Also, it is assumed that the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is calculated for each of the x component and the y component, and the skip determination unit 120 performs threshold determination for each of the x component and the y component of the difference. That is, the skip determination unit 120 determines whether both the x component and the y component of the difference are equal to or smaller than the threshold value b or whether one or both of the x component and the y component are larger than the threshold value b. It is assumed that the determination in step 26 includes that the direction of prediction (forward prediction, backward prediction, bidirectional prediction, or the like) is the same between the motion vector of the current macroblock and the motion vector of

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	the immediately preceding macroblock, that is, the reference frame is the same When it is determined in step 26 that both the x component and the y component of the difference are equal to or smaller than the threshold value b, the skip determination unit 120 determines that the macroblock is a skip macroblock (step 25). The skip determination unit 120 notifies the variable length coding unit 110, the motion vector replacement unit 121, and the addition unit 108 that the macroblock is determined to be a skip macroblock. In this way, in the case of a B picture, the skip determination unit 120 determines that the macroblock is a skip macroblock when the macroblock is not the first or last macroblock of the slice, the quantized block is 0, and the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is equal to or less than the threshold value b in both the x component and the y component. In the present embodiment, the threshold value b is 1.0. That is, when the skip determination unit 120 determines that both the x component and the y component of the motion vector difference between the current macroblock and the immediately preceding macroblock are equal to or smaller than 1.0, it determines that the current macroblock is a skip macroblock. If it is 1.0 or less, as in the case of the P picture, even if the coding of the macro block is omitted, the difference between the original image and the reproduced image is hardly noticeable to the human visual sense, so that there is substantially no problem. Note that the threshold value a and the threshold value b are not limited to 0.5 and 1.0, and, for example, the user may be allowed to set arbitrary values in the skip determination unit 120 within a range in which deterioration in image quality is allowable.
10[c] forming a prediction for the first segment with	The below references, as evidence by the example citations, disclose forming a prediction for the first segment with respect to a reference frame based at least in part on the assigned motion vector for the skip coding mode, wherein the assigned motion vector is one of the zero motion vector and the predicted non-zero motion vector.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
respect to a reference frame based at least in part on the assigned motion vector for the skip coding mode, wherein the assigned motion vector is one of the zero motion vector and the predicted non-zero motion vector; and	*See limitation 1[c].* *See, e.g.*, The '808 patent, 4:44-60: In order to illustrate the operation of a generic video coding system in greater detail, reference will now be made to the exemplary video encoder and video decoder illustrated in FIGS. 1 and 2 of the accompanying drawings. The video encoder 100 of FIG. 1 employs a combination of INTRA- and INTER-coding to produce a compressed (encoded) video bit-stream and decoder 200 of FIG. 2 is arranged to receive and decode the video bit-stream produced by encoder 100 in order to produce a reconstructed video sequence. Throughout the following description it will be assumed that the luminance component of a macroblock comprises 16×16 pixels arranged as an array of 4, 8×8 blocks, and that the associated chrominance components are spatially sub-sampled by a factor of two in the horizontal and vertical directions to form 8×8 blocks, as depicted in FIG. 3. Extension of the description to other block sizes and other sub-sampling schemes will be apparent to those of ordinary skill in the art. The '808 patent, 3:61-4:12 The video encoder 100 comprises an input 101 for receiving a digital video signal from a camera or other video source (not shown). It also comprises a transformation unit 104 which is arranged to perform a block-based discrete cosine transform (DCT), a quantizer 106, an inverse quantizer 108, an inverse transformation unit 110, arranged to perform an inverse block-based discrete cosine transform (IDCT), combiners 112 and 116, and a frame store 120. The encoder further comprises a motion estimator 130, a motion field coder 140 and a motion compensated predictor 150. Switches 102 and 114 are operated co-operatively by control manager 160 to switch the encoder between an INTRA-mode of video encoding and an INTER-mode of video encoding. The encoder 100 also comprises a video multiplex coder 170 which forms a single

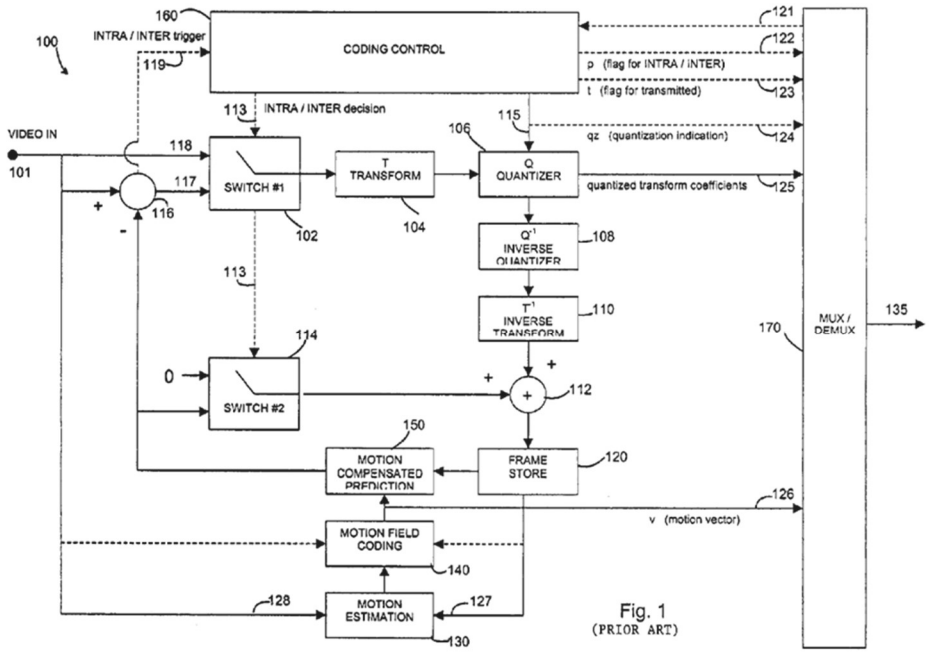
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	bit-stream from the various types of information produced by the encoder 100 for further transmission to a remote receiving terminal or, for example, for storage on a mass storage medium, such as a computer hard drive (not shown). The '808 patent, 7:30-8:18: The first step in forming a prediction for a macroblock of the current frame is performed by motion estimation block 130. The motion estimation block 130 receives the blocks of luminance and chrominance values which make up the current macroblock of the frame to be coded via line 128. It then performs a block matching operation in order to identify a region in the reference frame that corresponds best with the current macroblock. In order to perform the block matching operation, motion estimation block 130 accesses reference frame data stored in frame store 120 via line 127. More specifically, motion estimation block 130 performs block-matching by calculating difference values (e.g. sums of absolute differences) representing the difference in pixel values between the macroblock under examination and candidate best-matching regions of pixels from a reference frame stored in the frame store 120. A difference value is produced for candidate regions at all possible offsets within a predefined search region of the reference frame and motion estimation block 130 determines the smallest calculated difference value. The candidate region that yields the smallest difference value is selected as the best-matching region. The offset between the current macroblock and the best-matching region identified in the reference frame defines a "motion vector" for the macroblock in question. The motion vector typically comprises a pair of numbers, one describing the horizontal (Δx) between the current macroblock and the best-matching region of the reference frame, the other representing the vertical displacement (Δy). Once the motion estimation block 130 has produced a motion vector for the macroblock, it outputs the motion vector to the motion field coding block 140. The motion field coding block 140 approximates the motion vector received from motion estimation block 130 using a motion model comprising a set of basis functions and motion coefficients. More specifically, the

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	motion field coding block 140 represents the motion vector as a set of motion coefficient values which, when multiplied by the basis functions, form an approximation of the motion vector. Typically, a translational motion model having only two motion coefficients and basis functions is used, but motion models of greater complexity may also be used. The motion coefficients are passed from motion field coding block 140 to motion compensated prediction block 150. Motion compensated prediction block 150 also receives the best-matching region of pixel values identified by motion estimation block 130 from frame store 120. Using the approximate representation of the motion vector generated by motion field coding block 140 and the pixel values of the best-matching region of pixels from the reference frame, motion compensated prediction block 150 generates an array of predicted pixel values for each block of the current macroblock. Each block of predicted pixel values is passed to combiner 116 where the predicted pixel values are subtracted from the actual (input) pixel values in the corresponding block of the current macroblock. In this way a set of prediction error blocks for the macroblock is obtained. The ’808 patent, ’808 patent, 16:1-14: FIG. 6 is a schematic block diagram of a video encoder 600 implemented according to an embodiment of the invention. When encoding frames of a digital video sequence, encoder 600 operates in a manner similar to that previously described in connection with the prior art video encoder of FIG. 1 to generate INTRA-coded and INTER-coded compressed video frames. The structure of the video encoder shown in FIG. 6 is substantially identical to that of the prior art video encoder shown in FIG. 1, with appropriate modifications to the motion estimation part necessary to implement the video encoding method according to the invention. All parts of the video encoder which implement functions and operate in a manner identical to the previously described prior art video encoder are identified with identical reference numbers. The ’808 patent, FIG. 1:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	 Fig. 1 (PRIOR ART) Kuriki, [0002], [0004], [0008]: [Prior art] An encoding apparatus for compression-encoding moving image data by the MPEG method compresses moving image data by performing inter-frame prediction by motion compensation (hereinafter, referred to as motion compensated prediction). The frame of the

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	past of a frame, or the future (or the both) to which an object block belongs with motion compensation prediction about the block (it is hereafter called an object block) of the coding subject in a video data (hereinafter, referred to as a reference frame), and obtains a difference (hereinafter, referred to as a prediction error) of each pixel between the target block and the reference block, and a motion vector indicating a relative positional relationship between both blocks. Typically, motion compensated prediction is performed on a macroblock basis. … Here, the encoding type will be described. There are three kinds of encoding types, i.e., I picture, P picture, and B picture, and any one of the three kinds of encoding types is determined for each frame, and each frame is encoded by a different encoding method according to the encoding type. In a frame of an I picture, a luminance signal and two color difference signals of a macro block are subjected to DCT, quantization and variable length coding without performing motion compensation prediction. The I-picture frame serves as a reference frame of a frame of another encoding type. A frame of a P picture is motion-compensated and predicted using a frame of a past I picture or P picture as a reference frame, and a prediction error after the motion-compensated prediction is subjected to DCT, quantization, and variable length coding. The frame of the P picture serves as a reference frame of a macroblock of another P picture or B picture. The encoding method of the P picture is called unidirectional prediction. The frame of the B picture is motion-compensated and predicted using the frame of the past or future (or both) I picture or P picture as a reference frame, and the resulting prediction error is subjected to DCT, quantization, and variable length coding. It does not become a reference frame for other frames. The B-picture encoding method is called bidirectional prediction because it is predicted from both the past and future directions …. When a decoding device for decoding moving image data detects that there is a skip

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	macroblock from an address of a macroblock, the decoding device performs: The P picture is decoded by using a block at the same position as the skip macro block in the reference frame of the picture, and the B picture is decoded by using the motion vector of the left adjacent macro block. Lee, 63-64: Thus inter coding can be performed according to one of the following 15 modes of operation: SKIP: The current MB is replaced by the MB at the same spatial location in the previous reconstructed picture. Encoding is performed by skipping the current MB and incrementing the MB address. This mode is designed for areas in the picture where little or no change relative to the previously reconstructed picture is detected. FR-PMV: One motion vector for the current MB is predicted and used as an estimate. Motion vector searching is not performed. As only motion compensation is required, the MB is encoded using the header and the motion vector bits. When motion vectors can be accurately predicted, this mode becomes a likely candidate. H.263, § 6.1.1:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:

6.1.1 Differential motion vectors

The macroblock vector is obtained by adding predictors to the vector differences indicated by MVD (see Table 11). For differential coding with four vectors per macroblock, refer to Annex F. In case of one vector per macroblock, the candidate predictors for the differential coding are taken from three surrounding macroblocks as indicated in Figure 11. The predictors are calculated separately for the horizontal and vertical components.

In the special cases at the borders of the current GOB or picture, the following decision rules are applied in increasing order:

1) When the corresponding macroblock was coded in INTRA mode (if not in PB-frames mode) or was not coded (COD = 1), the candidate predictor is set to zero.
2) The candidate predictor MV1 is set to zero if the corresponding macroblock is outside the picture (at the left side).
3) Then, the candidate predictors MV2 and MV3 are set to MV1 if the corresponding macroblocks are outside the picture (at the top) or outside the GOB (at the top) if the GOB header of the current GOB is non-empty.
4) Then, the candidate predictor MV3 is set to zero if the corresponding macroblock is outside the picture (at the right side).

For each component, the predictor is the median value of the three candidate predictors for this component.

Advantage is taken of the fact that the range of motion vector component values is constrained. Each VLC word for MVD represents a pair of difference values. Only one of the pair will yield a macroblock vector component falling within the permitted range [–16, 15.5]. A positive value of the horizontal or vertical component of the motion vector signifies that the prediction is formed from pixels in the previous picture which are spatially to the right or below the pixels being predicted.

Kuriki, [0005-0006], [0026-0028]:

In addition to the above-described series of operations, the encoding apparatus performs an operation of skipping the variable length encoding when the quantization block or the motion vector has the same value as that of the adjacent macroblock or the macroblock at the same position in the previous or subsequent frame, which is referred to as a macroblock skip. Here, a

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	macroblock that is skipped is referred to as a skipped macroblock. More specifically, in the case of a P picture, the encoding device performs the macroblock skip on a macroblock in which the quantization block is 0, that is, all the quantized DCT coefficients in the quantization block are 0 and the motion vector thereof is 0, and In the case of a B picture, the quantization block is 0, and the macroblock skip is performed for a macroblock whose motion vector is the same in magnitude and direction as the motion vector of the left adjacent macroblock of the current macroblock. However, the encoding apparatus sets the start and end of the slice to no macroblock skipping of the located macroblock is performed. … On the other hand, if it is determined in step 23 that the current macroblock is a B picture, the skip determination unit 120 calculates the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock, and determines whether or not the difference is equal to or smaller than the threshold value b (step 26). Here the previous the macro block means a macro block which is an encoding target immediately before the encoding target macro block. In a frame, it is usually a macroblock located on the left side of a macroblock to be encoded. Also, it is assumed that the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is calculated for each of the x component and the y component, and the skip determination unit 120 performs threshold determination for each of the x component and the y component of the difference. That is, the skip determination unit 120 determines whether both the x component and the y component of the difference are equal to or smaller than the threshold value b or whether one or both of the x component and the y component are larger than the threshold value b. It is assumed that the determination in step 26 includes that the direction of prediction (forward prediction, backward prediction, bidirectional prediction, or the like) is the same between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock, that is, the reference frame is the same

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	When it is determined in step 26 that both the x component and the y component of the difference are equal to or smaller than the threshold value b, the skip determination unit 120 determines that the macroblock is a skip macroblock (step 25). The skip determination unit 120 notifies the variable length coding unit 110, the motion vector replacement unit 121, and the addition unit 108 that the macroblock is determined to be a skip macroblock. In this way, in the case of a B picture, the skip determination unit 120 determines that the macroblock is a skip macroblock when the macroblock is not the first or last macroblock of the slice, the quantized block is 0, and the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is equal to or less than the threshold value b in both the x component and the y component. In the present embodiment, the threshold value b is 1.0. That is, when the skip determination unit 120 determines that both the x component and the y component of the motion vector difference between the current macroblock and the immediately preceding macroblock are equal to or smaller than 1.0, it determines that the current macroblock is a skip macroblock. If it is 1.0 or less, as in the case of the P picture, even if the coding of the macro block is omitted, the difference between the original image and the reproduced image is hardly noticeable to the human visual sense, so that there is substantially no problem. Note that the threshold value a and the threshold value b are not limited to 0.5 and 1.0, and, for example, the user may be allowed to set arbitrary values in the skip determination unit 120 within a range in which deterioration in image quality is allowable.
10[d] a multiplexer for providing in an encoded bitstream an indication of the skip coding mode,	The below references, as evidence by the example citations, disclose a multiplexer for providing in an encoded bitstream an indication of the skip coding mode, wherein no further motion vector information for the first segment is coded in the encoded bitstream.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
wherein no further motion vector information for the first segment is coded in the encoded bitstream.	*See limitation 1[d].* *See, e.g.*, The '808 patent, 4:44-60: In order to illustrate the operation of a generic video coding system in greater detail, reference will now be made to the exemplary video encoder and video decoder illustrated in FIGS. 1 and 2 of the accompanying drawings. The video encoder 100 of FIG. 1 employs a combination of INTRA- and INTER-coding to produce a compressed (encoded) video bit-stream and decoder 200 of FIG. 2 is arranged to receive and decode the video bit-stream produced by encoder 100 in order to produce a reconstructed video sequence. Throughout the following description it will be assumed that the luminance component of a macroblock comprises 16×16 pixels arranged as an array of 4, 8×8 blocks, and that the associated chrominance components are spatially sub-sampled by a factor of two in the horizontal and vertical directions to form 8×8 blocks, as depicted in FIG. 3. Extension of the description to other block sizes and other sub-sampling schemes will be apparent to those of ordinary skill in the art. The '808 patent, 3:61-8:18 The video encoder 100 comprises an input 101 for receiving a digital video signal from a camera or other video source (not shown). It also comprises a transformation unit 104 which is arranged to perform a block-based discrete cosine transform (DCT), a quantizer 106, an inverse quantizer 108, an inverse transformation unit 110, arranged to perform an inverse block-based discrete cosine transform (IDCT), combiners 112 and 116, and a frame store 120. The encoder further comprises a motion estimator 130, a motion field coder 140 and a motion compensated predictor 150. Switches 102 and 114 are operated co-operatively by control manager 160 to switch the encoder between an INTRA-mode of video encoding and an INTER-mode of video encoding. The encoder 100 also comprises a video multiplex coder 170 which forms a single bit-stream from the various types of information produced by the encoder 100 for further

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	transmission to a remote receiving terminal or, for example, for storage on a mass storage medium, such as a computer hard drive (not shown). Encoder 100 operates as follows. Each frame of uncompressed video provided from the video source to input 101 is received and processed macroblock by macroblock, preferably in raster-scan order. When the encoding of a new video sequence starts, the first frame to be encoded is encoded as an INTRA-coded frame. Subsequently, the encoder is programmed to code each frame in INTER-coded format, unless one of the following conditions is met: 1) it is judged that the current macroblock of the frame being coded is so dissimilar from the pixel values in the reference frame used in its prediction that excessive prediction error information is produced, in which case the current macroblock is coded in INTRA-coded format; 2) a predefined INTRA frame repetition interval has expired; or 3) feedback is received from a receiving terminal indicating a request for a frame to be provided in INTRA-coded format. The occurrence of condition 1) is detected by monitoring the output of the combiner 116. The combiner 116 forms a difference between the current macroblock of the frame being coded and its prediction, produced in the motion compensated prediction block 150. If a measure of this difference (for example a sum of absolute differences of pixel values) exceeds a predetermined threshold, the combiner 116 informs the control manager 160 via a control line 119 and the control manager 160 operates the switches 102 and 114 via control line 113 so as to switch the encoder 100 into INTRA-coding mode. In this way, a frame which is otherwise encoded in INTER-coded format may comprise INTRA-coded macroblocks. Occurrence of condition 2) is monitored by means of a timer or frame counter implemented in the control manager 160, in such a way that if the timer expires, or the frame counter reaches a predetermined number of frames, the control manager 160 operates the switches 102 and 114 via control line 113 to switch the encoder into INTRA-coding mode. Condition 3) is triggered if the control manager 160 receives a feedback signal from, for example, a receiving terminal, via control line 121 indicating that an INTRA frame refresh is required by the receiving terminal. Such a condition may arise, for example, if a previously transmitted frame is badly corrupted by interference

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	during its transmission, rendering it impossible to decode at the receiver. In this situation, the receiving decoder issues a request for the next frame to be encoded in INTRA-coded format, thus re-initialising the coding sequence. Operation of the encoder 100 in INTRA-coding mode will now be described. In INTRA-coding mode, the control manager 160 operates the switch 102 to accept video input from input line 118. The video signal input is received macroblock by macroblock from input 101 via the input line 118. As they are received, the blocks of luminance and chrominance values which make up the macroblock are passed to the DCT transformation block 104, which performs a 2-dimensional discrete cosine transform on each block of values, producing a 2-dimensional array of DCT coefficients for each block. DCT transformation block 104 produces an array of coefficient values for each block, the number of coefficient values corresponding to the dimensions of the blocks which make up the macroblock (in this case 8×8). The DCT coefficients for each block are passed to the quantizer 106, where they are quantized using a quantization parameter QP. Selection of the quantization parameter QP is controlled by the control manager 160 via control line 115. The array of quantized DCT coefficients for each block is then passed from the quantizer 106 to the video multiplex coder 170, as indicated by line 125 in FIG. 1. The video multiplex coder 170 orders the quantized transform coefficients for each block using a zigzag scanning procedure, thereby converting the two-dimensional array of quantized transform coefficients into a one-dimensional array. Each non-zero valued quantized coefficient in the one dimensional array is then represented as a pair of values, referred to as level and run, where level is the value of the quantized coefficient and run is the number of consecutive zero-valued coefficients preceding the coefficient in question. The run and level values are further compressed in the video multiplex coder 170 using entropy coding, for example, variable length coding (VLC), or arithmetic coding. Once the run and level values have been entropy coded using an appropriate method, the video

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	multiplex coder 170 further combines them with control information, also entropy coded using a method appropriate for the kind of information in question, to form a single compressed bit-stream of coded image information 135. It should be noted that while entropy coding has been described in connection with operations performed by the video multiplex coder 170, in alternative implementations a separate entropy coding unit may be provided. A locally decoded version of the macroblock is also formed in the encoder 100. This is done by passing the quantized transform coefficients for each block, output by quantizer 106, through inverse quantizer 108 and applying an inverse DCT transform in inverse transformation block 110. In this way a reconstructed array of pixel values is constructed for each block of the macroblock. The resulting decoded image data is input to combiner 112. In INTRA-coding mode, switch 114 is set so that the input to the combiner 112 via switch 114 is zero. In this way, the operation performed by combiner 112 is equivalent to passing the decoded image data unaltered. As subsequent macroblocks of the current frame are received and undergo the previously described encoding and local decoding steps in blocks 104, 106, 108, 110 and 112, a decoded version of the INTRA-coded frame is built up in frame store 120. When the last macroblock of the current frame has been INTRA-coded and subsequently decoded, the frame store 120 contains a completely decoded frame, available for use as a motion prediction reference frame in coding a subsequently received video frame in INTER-coded format. Operation of the encoder 100 in INTER-coding mode will now be described. In INTER-coding mode, the control manager 160 operates switch 102 to receive its input from line 117, which comprises the output of combiner 116. The combiner 116 receives the video input signal macroblock by macroblock from input 101. As combiner 116 receives the blocks of luminance and chrominance values which make up the macroblock, it forms corresponding blocks of prediction error information. The prediction error information represents the difference between the block in question and its prediction, produced in motion compensated prediction block 150.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	More specifically, the prediction error information for each block of the macroblock comprises a two-dimensional array of values, each of which represents the difference between a pixel value in the block of luminance or chrominance information being coded and a decoded pixel value obtained by forming a motion-compensated prediction for the block, according to the procedure to be described below. Thus, in the exemplary video coding system considered here where each macroblock comprises, for example, an assembly of 8×8 blocks comprising luminance and chrominance values, the prediction error information for each block of the macroblock similarly comprises an 8×8 array of prediction error values. The prediction error information for each block of the macroblock is passed to DCT transformation block 104, which performs a two-dimensional discrete cosine transform on each block of prediction error values to produce a two-dimensional array of DCT transform coefficients for each block. DCT transformation block 104 produces an array of coefficient values for each prediction error block, the number of coefficient values corresponding to the dimensions of the blocks which make up the macroblock (in this case 8×8). The transform coefficients derived from each prediction error block are passed to quantizer 106 where they are quantized using a quantization parameter QP, in a manner analogous to that described above in connection with operation of the encoder in INTRA-coding mode. As before, selection of the quantization parameter QP is controlled by the control manager 160 via control line 115. The quantized DCT coefficients representing the prediction error information for each block of the macroblock are passed from quantizer 106 to video multiplex coder 170, as indicated by line 125 in FIG. 1. As in INTRA-coding mode, the video multiplex coder 170 orders the transform coefficients for each prediction error block using a certain zigzag scanning procedure and then represents each non-zero valued quantized coefficient as a run-level pair. It further compresses the run-level pairs using entropy coding, in a manner analogous to that described above in connection with INTRA-coding mode. Video multiplex coder 170 also receives motion vector information (described in the following) from motion field coding block 140 via

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	line 126 and control information from control manager 160. It entropy codes the motion vector information and control information and forms a single bit-stream of coded image information, 135 comprising the entropy coded motion vector, prediction error and control information. The quantized DCT coefficients representing the prediction error information for each block of the macroblock are also passed from quantizer 106 to inverse quantizer 108. Here they are inverse quantized and the resulting blocks of inverse quantized DCT coefficients are applied to inverse DCT transform block 110, where they undergo inverse DCT transformation to produce locally decoded blocks of prediction error values. The locally decoded blocks of prediction error values are then input to combiner 112. In INTER-coding mode, switch 114 is set so that the combiner 112 also receives predicted pixel values for each block of the macroblock, generated by motion-compensated prediction block 150. The combiner 112 combines each of the locally decoded blocks of prediction error values with a corresponding block of predicted pixel values to produce reconstructed image blocks and stores them in frame store 120. As subsequent macroblocks of the video signal are received from the video source and undergo the previously described encoding and decoding steps in blocks 104, 106, 108, 110, 112, a decoded version of the frame is built up in frame store 120. When the last macroblock of the frame has been processed, the frame store 120 contains a completely decoded frame, available for use as a motion prediction reference frame in encoding a subsequently received video frame in INTER-coded format. The details of the motion-compensated prediction performed by video encoder 100 will now be considered. Any frame encoded in INTER-coded format requires a reference frame for motion-compensated prediction. This means, necessarily, that when encoding a video sequence, the first frame to be encoded, whether it is the first frame in the sequence, or some other frame, must be encoded in INTRA-coded format. This, in turn, means that when the video encoder

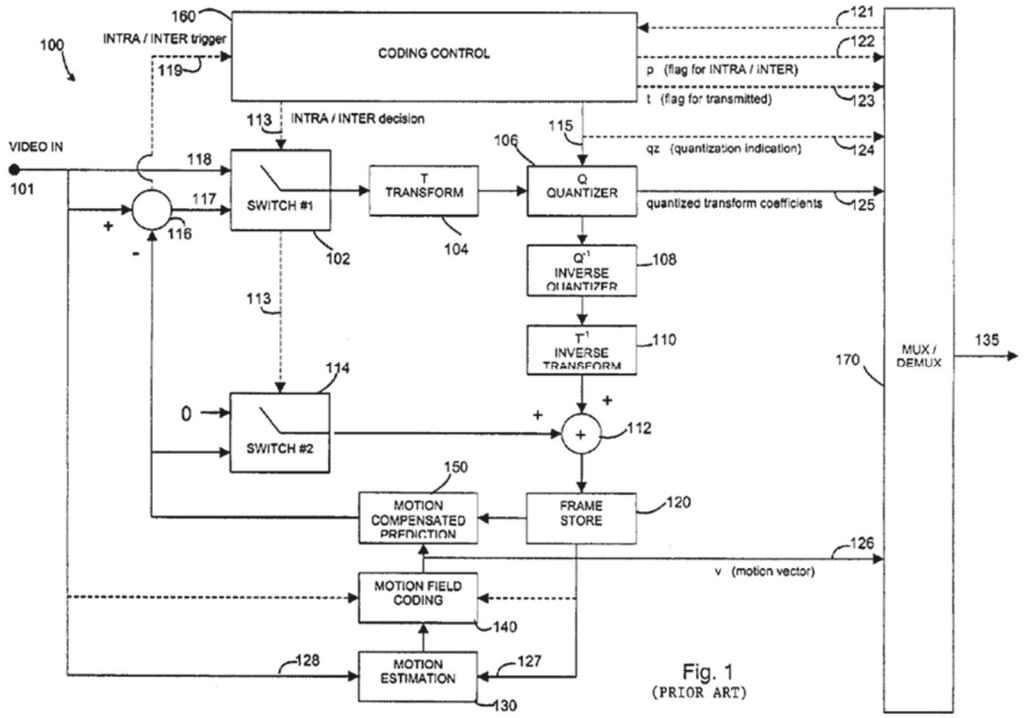
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	100 is switched into INTER-coding mode by control manager 160, a complete reference frame, formed by locally decoding a previously encoded frame, is already available in the frame store 120 of the encoder. In general, the reference frame is formed by locally decoding either an INTRA-coded frame or an INTER-coded frame. In the following description it will be assumed that the encoder performs motion compensated prediction on a macroblock basis, i.e. a macroblock is the smallest element of a video frame that can be associated with motion information. It will further be assumed that a prediction for a given macroblock is formed by identifying a region of 16×16 values in the luminance component of the reference frame that shows best correspondence with the 16×16 luminance values of the macroblock in question. Motion-compensated prediction in a video coding system where motion information may be associated with elements smaller than a macroblock will be considered later in the text. The first step in forming a prediction for a macroblock of the current frame is performed by motion estimation block 130. The motion estimation block 130 receives the blocks of luminance and chrominance values which make up the current macroblock of the frame to be coded via line 128. It then performs a block matching operation in order to identify a region in the reference frame that corresponds best with the current macroblock. In order to perform the block matching operation, motion estimation block 130 accesses reference frame data stored in frame store 120 via line 127. More specifically, motion estimation block 130 performs block-matching by calculating difference values (e.g. sums of absolute differences) representing the difference in pixel values between the macroblock under examination and candidate best-matching regions of pixels from a reference frame stored in the frame store 120. A difference value is produced for candidate regions at all possible offsets within a predefined search region of the reference frame and motion estimation block 130 determines the smallest calculated difference value. The candidate region that yields the smallest difference value is selected as the best-matching region. The offset between the current macroblock and the best-matching region identified in the reference frame defines a “motion vector” for the macroblock in

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	question. The motion vector typically comprises a pair of numbers, one describing the horizontal (Δx) between the current macroblock and the best-matching region of the reference frame, the other representing the vertical displacement (Δy). Once the motion estimation block 130 has produced a motion vector for the macroblock, it outputs the motion vector to the motion field coding block 140. The motion field coding block 140 approximates the motion vector received from motion estimation block 130 using a motion model comprising a set of basis functions and motion coefficients. More specifically, the motion field coding block 140 represents the motion vector as a set of motion coefficient values which, when multiplied by the basis functions, form an approximation of the motion vector. Typically, a translational motion model having only two motion coefficients and basis functions is used, but motion models of greater complexity may also be used. The motion coefficients are passed from motion field coding block 140 to motion compensated prediction block 150. Motion compensated prediction block 150 also receives the best-matching region of pixel values identified by motion estimation block 130 from frame store 120. Using the approximate representation of the motion vector generated by motion field coding block 140 and the pixel values of the best-matching region of pixels from the reference frame, motion compensated prediction block 150 generates an array of predicted pixel values for each block of the current macroblock. Each block of predicted pixel values is passed to combiner 116 where the predicted pixel values are subtracted from the actual (input) pixel values in the corresponding block of the current macroblock. In this way a set of prediction error blocks for the macroblock is obtained. The '808 patent, FIG. 1:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	 Fig. 1 (PRIOR ART) Nakaya, Fig. 1, 2, 2:43-46: Finally, an H.263 coded bitstream 123 is acquired by multiplexing the quantized DCT coefficients, motion vectors, the and interframe/intraframe identifier flag information in a multiplexer 122.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	… The H.263 coded bit stream 217 that is received is demultiplexed into quantized DCT coefficients 201, motion vector data 202, and a interframe/intraframe identifier flag 203 in the demultiplexer 216.
11. An encoder according to claim 10, wherein the second segment is a previously encoded segment neighboring the first segment.	The below references, as evidence by the example citations, disclose that the second segment is a previously encoded segment neighboring the first segment. *See, e.g.*, *See claim 2.*
15. An encoder according to claim 10, wherein if a segment in a region surrounding the first segment has zero motion vector, the encoder is arranged to assign the zero motion vector for the skip coding mode of the first segment and the prediction for the first segment is formed with respect	The below references, as evidence by the example citations, disclose that if a segment in a region surrounding the first segment has zero motion vector, the encoder is arranged to assign the zero motion vector for the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector. *See, e.g.*, *See claim 6.* *See claim 1[preamble].*

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
to a corresponding segment of the reference frame associated with the zero motion vector.	
16[preamble] A video decoder for decoding an encoded video sequence, the decoder comprising:	The below references, as evidence by the example citations, disclose a video decoder for decoding an encoded video sequence. *See limitation 7[preamble].* *See, e.g.*, The '808 patent, 4:44-60: > In order to illustrate the operation of a generic video coding system in greater detail, reference will now be made to the exemplary video encoder and video decoder illustrated in FIGS. 1 and 2 of the accompanying drawings. The video encoder 100 of FIG. 1 employs a combination of INTRA- and INTER-coding to produce a compressed (encoded) video bit-stream and decoder 200 of FIG. 2 is arranged to receive and decode the video bit-stream produced by encoder 100 in order to produce a reconstructed video sequence. Throughout the following description it will be assumed that the luminance component of a macroblock comprises 16×16 pixels arranged as an array of 4, 8×8 blocks, and that the associated chrominance components are spatially sub-sampled by a factor of two in the horizontal and vertical directions to form 8×8 blocks, as depicted in FIG. 3. Extension of the description to other block sizes and other sub-sampling schemes will be apparent to those of ordinary skill in the art. The '808 patent, 8:19-10:22:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	Operation of the video decoder 200, shown in FIG. 2 will now be described. The decoder 200 comprises a video multiplex decoder 270, which receives an encoded video bit-stream 135 from the encoder 100 and demultiplexes it into its constituent parts, an inverse quantizer 210, an inverse DCT transformer 220, a motion compensated prediction block 240, a frame store 250, a combiner 230, a control manager 260, and an output 280. The control manager 260 controls the operation of the decoder 200 in response to whether an INTRA- or an INTER-coded frame is being decoded. An INTRA/INTER trigger control signal, which causes the decoder to switch between decoding modes is derived, for example, from picture type information associated with each compressed video frame received from the encoder. The INTRA/INTER trigger control signal is extracted from the encoded video bit-stream by the video multiplex decoder 270 and is passed to control manager 260 via control line 215. Decoding of an INTRA-coded frame is performed on a macroblock-by-macroblock basis, each macroblock being decoded substantially as soon as encoded information relating to it is received in the video bit-stream 135. The video multiplex decoder 270 separates the encoded information for the blocks of the macroblock from possible control information relating to the macroblock in question. The encoded information for each block of an INTRA-coded macroblock comprises variable length codewords representing the entropy coded level and run values for the non-zero quantized DCT coefficients of the block. The video multiplex decoder 270 decodes the variable length codewords using a variable length decoding method corresponding to the encoding method used in the encoder 100 and thereby recovers the level and run values. It then reconstructs the array of quantized transform coefficient values for each block of the macroblock and passes them to inverse quantizer 210. Any control information relating to the macroblock is also decoded in the video multiplex decoder 270 using an appropriate decoding method and is passed to control manager 260. In particular, information relating to the level of quantization applied to the transform coefficients is extracted from the encoded bit-stream by video multiplex decoder 270 and provided to control manager 260 via

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	control line 217. The control manager, in turn, conveys this information to inverse quantizer 210 via control line 218. Inverse quantizer 210 inverse quantizes the quantized DCT coefficients for each block of the macroblock according to the control information and provides the now inverse quantized DCT coefficients to inverse DCT transformer 220. Inverse DCT transformer 220 performs an inverse DCT transform on the inverse quantized DCT coefficients for each block of the macroblock to form a decoded block of image information comprising reconstructed pixel values. The reconstructed pixel values for each block of the macroblock are passed via combiner 230 to the video output 280 of the decoder where, for example, they can be provided to a display device (not shown). The reconstructed pixel values for each block are also stored in frame store 250. Because motion-compensated prediction is not used in the encoding/decoding of INTRA coded macroblocks control manager 260 controls combiner 230 to pass each block of pixel values as such to the video output 280 and frame store 250. As subsequent macroblocks of the INTRA-coded frame are decoded and stored, a decoded frame is progressively assembled in the frame store 250 and thus becomes available for use as a reference frame for motion compensated prediction in connection with the decoding of subsequently received INTER-coded frames. INTER-coded frames are also decoded macroblock by macroblock, each INTER-coded macroblock being decoded substantially as soon as encoded information relating to it is received in the bit-stream 135. The video multiplex decoder 270 separates the encoded prediction error information for each block of an INTER-coded macroblock from encoded motion vector information and possible control information relating to the macroblock in question. As explained in the foregoing, the encoded prediction error information for each block of the macroblock comprises variable length codewords representing the entropy coded level and run values for the non-zero quantized transform coefficients of the prediction error block in question. The video multiplex decoder 270 decodes the variable length codewords using a variable length decoding method corresponding to the encoding method used in the encoder 100 and thereby recovers the level and run values. It then reconstructs an array of

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	quantized transform coefficient values for each prediction error block and passes them to inverse quantizer 210. Control information relating to the INTER-coded macroblock is also decoded in the video multiplex decoder 270 using an appropriate decoding method and is passed to control manager 260. Information relating to the level of quantization applied to the transform coefficients of the prediction error blocks is extracted from the encoded bit-stream and provided to control manager 260 via control line 217. The control manager, in turn, conveys this information to inverse quantizer 210 via control line 218. Inverse quantizer 210 inverse quantizes the quantized DCT coefficients representing the prediction error information for each block of the macroblock according to the control information and provides the now inverse quantized DCT coefficients to inverse DCT transformer 220. The inverse quantized DCT coefficients representing the prediction error information for each block are then inverse transformed in the inverse DCT transformer 220 to yield an array of reconstructed prediction error values for each block of the macroblock. The encoded motion vector information associated with the macroblock is extracted from the encoded video bit-stream 135 by video multiplex decoder 270 and is decoded. The decoded motion vector information thus obtained is passed via control line 225 to motion compensated prediction block 240, which reconstructs a motion vector for the macroblock using the same motion model as that used to encode the INTER-coded macroblock in encoder 100. The reconstructed motion vector approximates the motion vector originally determined by motion estimation block 130 of the encoder. The motion compensated prediction block 240 of the decoder uses the reconstructed motion vector to identify the location of a region of reconstructed pixels in a prediction reference frame stored in frame store 250. The reference frame may be, for example, a previously decoded INTRA-coded frame, or a previously decoded INTER-coded frame. In either case, the region of pixels indicated by the reconstructed motion vector is used to form a prediction for the macroblock in question. More specifically, the motion compensated prediction block 240 forms an array of pixel values for each block of the macroblock by copying corresponding pixel values from the region of pixels identified by

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	the motion vector. The prediction, that is the blocks of pixel values derived from the reference frame, are passed from motion compensated prediction block 240 to combiner 230 where they are combined with the decoded prediction error information. In practice, the pixel values of each predicted block are added to corresponding reconstructed prediction error values output by inverse DCT transformer 220. In this way an array of reconstructed pixel values for each block of the macroblock is obtained. The reconstructed pixel values are passed to the video output 280 of the decoder and are also stored in frame store 250. As subsequent macroblocks of the INTER-coded frame are decoded and stored, a decoded frame is progressively assembled in the frame store 250 and thus becomes available for use as a reference frame for motion-compensated prediction of other INTER-coded frames. The '808 patent, 20:26-42: Operation of a video decoder 700 according to an embodiment of the invention will now be described with reference to FIG. 7. The structure of the video decoder illustrated in FIG. 7 is substantially identical to that of the prior art video decoder shown in FIG. 2, with appropriate modifications to those parts of the decoder that perform motion estimation operations. All parts of the video decoder which implement functions and operate in a manner identical to the previously described prior art video decoder are identified with identical reference numbers. It is further assumed that the video decoder of FIG. 7 corresponds to the encoder described in connection with FIG. 6 and is therefore capable of receiving and decoding the bit-stream 635 transmitted by encoder 600. Furthermore, as the present invention affects the decoding of video frames in INTER-coded format, description of the operations performed by decoder 700 in connection with the decoding of INTRA-coded frames will be omitted. The '808 patent, FIG. 2:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:

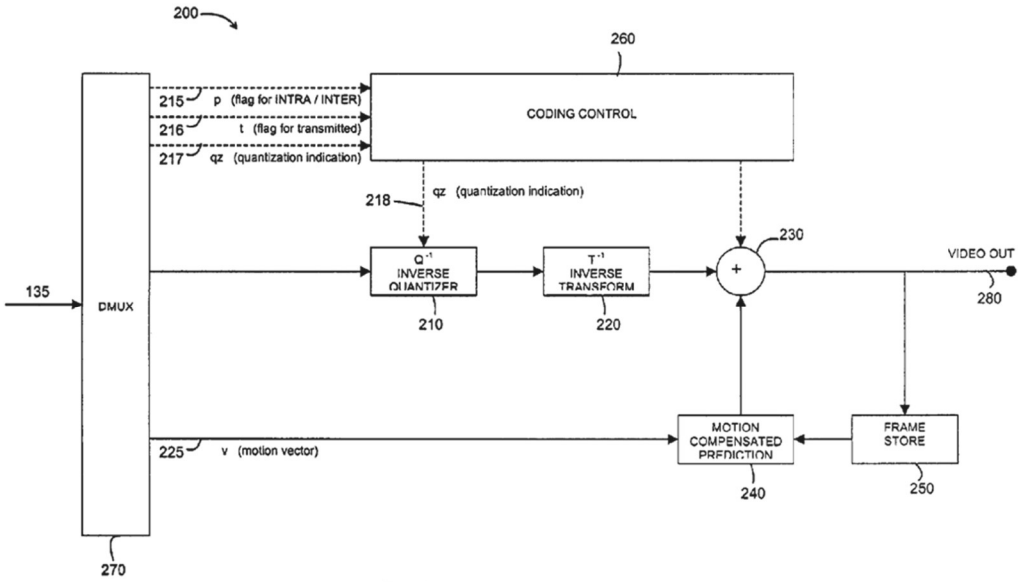


Fig. 2
(PRIOR ART)

Hsieh, 995:

> In general moving scenes, motion objects often cover many small blocks such that the motion of the spatial neighbor blocks may be similar. In addition, due to the continuity of motion in temporal direction, the motion of the temporal neighbor blocks may be highly correlated. In other words, the motion vector of the current block can be predicted from that of the neighbor blocks in the temporal or spatial direction.

ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
16[a] a demultiplexer for receiving an indication of a skip coding mode assigned to a first segment;	*See limitation 7[a].* *See, e.g.*, The '808 patent, 4:44-60: > In order to illustrate the operation of a generic video coding system in greater detail, reference will now be made to the exemplary video encoder and video decoder illustrated in FIGS. 1 and 2 of the accompanying drawings. The video encoder 100 of FIG. 1 employs a combination of INTRA- and INTER-coding to produce a compressed (encoded) video bit-stream and decoder 200 of FIG. 2 is arranged to receive and decode the video bit-stream produced by encoder 100 in order to produce a reconstructed video sequence. Throughout the following description it will be assumed that the luminance component of a macroblock comprises 16×16 pixels arranged as an array of 4, 8×8 blocks, and that the associated chrominance components are spatially sub-sampled by a factor of two in the horizontal and vertical directions to form 8×8 blocks, as depicted in FIG. 3. Extension of the description to other block sizes and other sub-sampling schemes will be apparent to those of ordinary skill in the art. The '808 patent, 8:19-10:22: > Operation of the video decoder 200, shown in FIG. 2 will now be described. The decoder 200 comprises a video multiplex decoder 270, which receives an encoded video bit-stream 135 from the encoder 100 and demultiplexes it into its constituent parts, an inverse quantizer 210, an inverse DCT transformer 220, a motion compensated prediction block 240, a frame store 250, a combiner 230, a control manager 260, and an output 280. > The control manager 260 controls the operation of the decoder 200 in response to whether an

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	INTRA- or an INTER-coded frame is being decoded. An INTRA/INTER trigger control signal, which causes the decoder to switch between decoding modes is derived, for example, from picture type information associated with each compressed video frame received from the encoder. The INTRA/INTER trigger control signal is extracted from the encoded video bit-stream by the video multiplex decoder 270 and is passed to control manager 260 via control line 215. Decoding of an INTRA-coded frame is performed on a macroblock-by-macroblock basis, each macroblock being decoded substantially as soon as encoded information relating to it is received in the video bit-stream 135. The video multiplex decoder 270 separates the encoded information for the blocks of the macroblock from possible control information relating to the macroblock in question. The encoded information for each block of an INTRA-coded macroblock comprises variable length codewords representing the entropy coded level and run values for the non-zero quantized DCT coefficients of the block. The video multiplex decoder 270 decodes the variable length codewords using a variable length decoding method corresponding to the encoding method used in the encoder 100 and thereby recovers the level and run values. It then reconstructs the array of quantized transform coefficient values for each block of the macroblock and passes them to inverse quantizer 210. Any control information relating to the macroblock is also decoded in the video multiplex decoder 270 using an appropriate decoding method and is passed to control manager 260. In particular, information relating to the level of quantization applied to the transform coefficients is extracted from the encoded bit-stream by video multiplex decoder 270 and provided to control manager 260 via control line 217. The control manager, in turn, conveys this information to inverse quantizer 210 via control line 218. Inverse quantizer 210 inverse quantizes the quantized DCT coefficients for each block of the macroblock according to the control information and provides the now inverse quantized DCT coefficients to inverse DCT transformer 220. Inverse DCT transformer 220 performs an inverse DCT transform on the inverse quantized DCT coefficients for each block of the macroblock to form a decoded block of image

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	information comprising reconstructed pixel values. The reconstructed pixel values for each block of the macroblock are passed via combiner 230 to the video output 280 of the decoder where, for example, they can be provided to a display device (not shown). The reconstructed pixel values for each block are also stored in frame store 250. Because motion-compensated prediction is not used in the encoding/decoding of INTRA coded macroblocks control manager 260 controls combiner 230 to pass each block of pixel values as such to the video output 280 and frame store 250. As subsequent macroblocks of the INTRA-coded frame are decoded and stored, a decoded frame is progressively assembled in the frame store 250 and thus becomes available for use as a reference frame for motion compensated prediction in connection with the decoding of subsequently received INTER-coded frames. INTER-coded frames are also decoded macroblock by macroblock, each INTER-coded macroblock being decoded substantially as soon as encoded information relating to it is received in the bit-stream 135. The video multiplex decoder 270 separates the encoded prediction error information for each block of an INTER-coded macroblock from encoded motion vector information and possible control information relating to the macroblock in question. As explained in the foregoing, the encoded prediction error information for each block of the macroblock comprises variable length codewords representing the entropy coded level and run values for the non-zero quantized transform coefficients of the prediction error block in question. The video multiplex decoder 270 decodes the variable length codewords using a variable length decoding method corresponding to the encoding method used in the encoder 100 and thereby recovers the level and run values. It then reconstructs an array of quantized transform coefficient values for each prediction error block and passes them to inverse quantizer 210. Control information relating to the INTER-coded macroblock is also decoded in the video multiplex decoder 270 using an appropriate decoding method and is passed to control manager 260. Information relating to the level of quantization applied to the transform coefficients of the prediction error blocks is extracted from the encoded bit-stream and provided to control manager 260 via control line 217. The control manager, in turn,

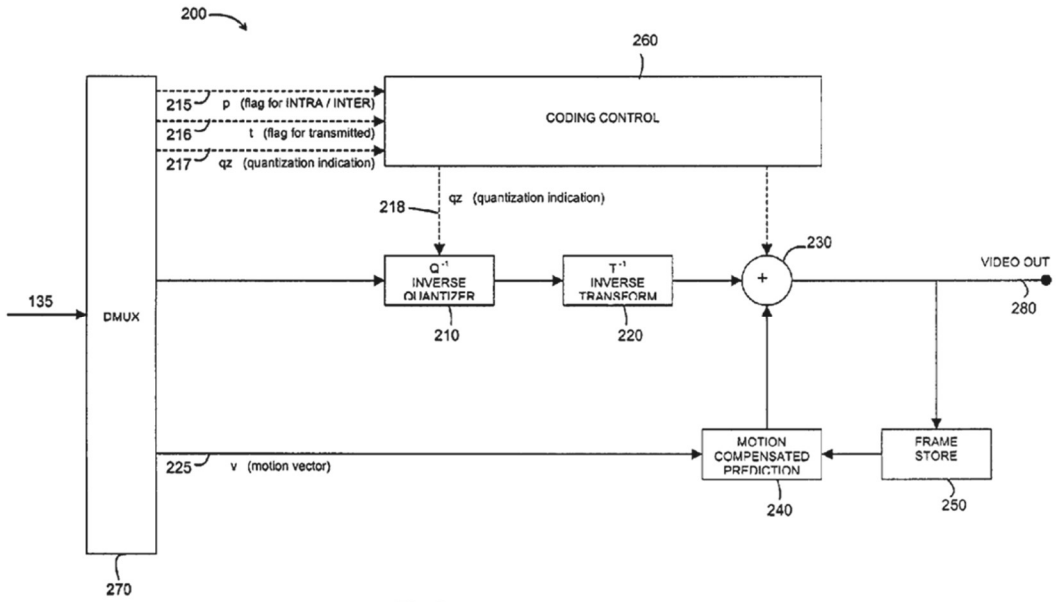
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	conveys this information to inverse quantizer 210 via control line 218. Inverse quantizer 210 inverse quantizes the quantized DCT coefficients representing the prediction error information for each block of the macroblock according to the control information and provides the now inverse quantized DCT coefficients to inverse DCT transformer 220. The inverse quantized DCT coefficients representing the prediction error information for each block are then inverse transformed in the inverse DCT transformer 220 to yield an array of reconstructed prediction error values for each block of the macroblock. The encoded motion vector information associated with the macroblock is extracted from the encoded video bit-stream 135 by video multiplex decoder 270 and is decoded. The decoded motion vector information thus obtained is passed via control line 225 to motion compensated prediction block 240, which reconstructs a motion vector for the macroblock using the same motion model as that used to encode the INTER-coded macroblock in encoder 100. The reconstructed motion vector approximates the motion vector originally determined by motion estimation block 130 of the encoder. The motion compensated prediction block 240 of the decoder uses the reconstructed motion vector to identify the location of a region of reconstructed pixels in a prediction reference frame stored in frame store 250. The reference frame may be, for example, a previously decoded INTRA-coded frame, or a previously decoded INTER-coded frame. In either case, the region of pixels indicated by the reconstructed motion vector is used to form a prediction for the macroblock in question. More specifically, the motion compensated prediction block 240 forms an array of pixel values for each block of the macroblock by copying corresponding pixel values from the region of pixels identified by the motion vector. The prediction, that is the blocks of pixel values derived from the reference frame, are passed from motion compensated prediction block 240 to combiner 230 where they are combined with the decoded prediction error information. In practice, the pixel values of each predicted block are added to corresponding reconstructed prediction error values output by inverse DCT transformer 220. In this way an array of reconstructed pixel values for each block of the macroblock is obtained. The reconstructed pixel values are passed to the video output

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	280 of the decoder and are also stored in frame store 250. As subsequent macroblocks of the INTER-coded frame are decoded and stored, a decoded frame is progressively assembled in the frame store 250 and thus becomes available for use as a reference frame for motion-compensated prediction of other INTER-coded frames. The '808 patent, 20:26-42: Operation of a video decoder 700 according to an embodiment of the invention will now be described with reference to FIG. 7. The structure of the video decoder illustrated in FIG. 7 is substantially identical to that of the prior art video decoder shown in FIG. 2, with appropriate modifications to those parts of the decoder that perform motion estimation operations. All parts of the video decoder which implement functions and operate in a manner identical to the previously described prior art video decoder are identified with identical reference numbers. It is further assumed that the video decoder of FIG. 7 corresponds to the encoder described in connection with FIG. 6 and is therefore capable of receiving and decoding the bit-stream 635 transmitted by encoder 600. Furthermore, as the present invention affects the decoding of video frames in INTER-coded format, description of the operations performed by decoder 700 in connection with the decoding of INTRA-coded frames will be omitted. The '808 patent, FIG. 2:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	 Fig. 2 (PRIOR ART) Nakaya, Fig. 1, 2, 2:43-46: Finally, an H.263 coded bitstream 123 is acquired by multiplexing the quantized DCT coefficients, motion vectors, the and interframe/intraframe identifier flag information in a multiplexer 122. …

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	The H.263 coded bit stream 217 that is received is demultiplexed into quantized DCT coefficients 201, motion vector data 202, and a interframe/intraframe identifier flag 203 in the demultiplexer 216.
16[b] a motion compensated prediction block for assigning either a zero motion vector or a predicted non-zero motion vector for the skip coding mode for the first segment based at least in part on the motion information of a second segment neighboring the first segment; and	The below references, as evidence by the example citations, disclose a motion compensated prediction block for assigning either a zero motion vector or a predicted non-zero motion vector for the skip coding mode for the first segment based at least in part on the motion information of a second segment neighboring the first segment. *See limitation 7[b].* *See, e.g.*, The '808 patent, 4:44-60: In order to illustrate the operation of a generic video coding system in greater detail, reference will now be made to the exemplary video encoder and video decoder illustrated in FIGS. 1 and 2 of the accompanying drawings. The video encoder 100 of FIG. 1 employs a combination of INTRA- and INTER-coding to produce a compressed (encoded) video bit-stream and decoder 200 of FIG. 2 is arranged to receive and decode the video bit-stream produced by encoder 100 in order to produce a reconstructed video sequence. Throughout the following description it will be assumed that the luminance component of a macroblock comprises 16×16 pixels arranged as an array of 4, 8×8 blocks, and that the associated chrominance components are spatially sub-sampled by a factor of two in the horizontal and vertical directions to form 8×8 blocks, as depicted in FIG. 3. Extension of the description to other block sizes and other sub-

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	sampling schemes will be apparent to those of ordinary skill in the art. The ’808 patent, 8:19-10:22: Operation of the video decoder 200, shown in FIG. 2 will now be described. The decoder 200 comprises a video multiplex decoder 270, which receives an encoded video bit-stream 135 from the encoder 100 and demultiplexes it into its constituent parts, an inverse quantizer 210, an inverse DCT transformer 220, a motion compensated prediction block 240, a frame store 250, a combiner 230, a control manager 260, and an output 280. The control manager 260 controls the operation of the decoder 200 in response to whether an INTRA- or an INTER-coded frame is being decoded. An INTRA/INTER trigger control signal, which causes the decoder to switch between decoding modes is derived, for example, from picture type information associated with each compressed video frame received from the encoder. The INTRA/INTER trigger control signal is extracted from the encoded video bit-stream by the video multiplex decoder 270 and is passed to control manager 260 via control line 215. Decoding of an INTRA-coded frame is performed on a macroblock-by-macroblock basis, each macroblock being decoded substantially as soon as encoded information relating to it is received in the video bit-stream 135. The video multiplex decoder 270 separates the encoded information for the blocks of the macroblock from possible control information relating to the macroblock in question. The encoded information for each block of an INTRA-coded macroblock comprises variable length codewords representing the entropy coded level and run values for the non-zero quantized DCT coefficients of the block. The video multiplex decoder 270 decodes the variable length codewords using a variable length decoding method corresponding to the encoding method used in the encoder 100 and thereby recovers the level and run values. It then reconstructs the array of quantized transform coefficient values for each block of the macroblock and passes them to inverse quantizer 210. Any control information

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	relating to the macroblock is also decoded in the video multiplex decoder 270 using an appropriate decoding method and is passed to control manager 260. In particular, information relating to the level of quantization applied to the transform coefficients is extracted from the encoded bit-stream by video multiplex decoder 270 and provided to control manager 260 via control line 217. The control manager, in turn, conveys this information to inverse quantizer 210 via control line 218. Inverse quantizer 210 inverse quantizes the quantized DCT coefficients for each block of the macroblock according to the control information and provides the now inverse quantized DCT coefficients to inverse DCT transformer 220. Inverse DCT transformer 220 performs an inverse DCT transform on the inverse quantized DCT coefficients for each block of the macroblock to form a decoded block of image information comprising reconstructed pixel values. The reconstructed pixel values for each block of the macroblock are passed via combiner 230 to the video output 280 of the decoder where, for example, they can be provided to a display device (not shown). The reconstructed pixel values for each block are also stored in frame store 250. Because motion-compensated prediction is not used in the encoding/decoding of INTRA coded macroblocks control manager 260 controls combiner 230 to pass each block of pixel values as such to the video output 280 and frame store 250. As subsequent macroblocks of the INTRA-coded frame are decoded and stored, a decoded frame is progressively assembled in the frame store 250 and thus becomes available for use as a reference frame for motion compensated prediction in connection with the decoding of subsequently received INTER-coded frames. INTER-coded frames are also decoded macroblock by macroblock, each INTER-coded macroblock being decoded substantially as soon as encoded information relating to it is received in the bit-stream 135. The video multiplex decoder 270 separates the encoded prediction error information for each block of an INTER-coded macroblock from encoded motion vector information and possible control information relating to the macroblock in question. As explained in the foregoing, the encoded prediction error information for each block of the macroblock comprises variable length codewords representing the entropy coded

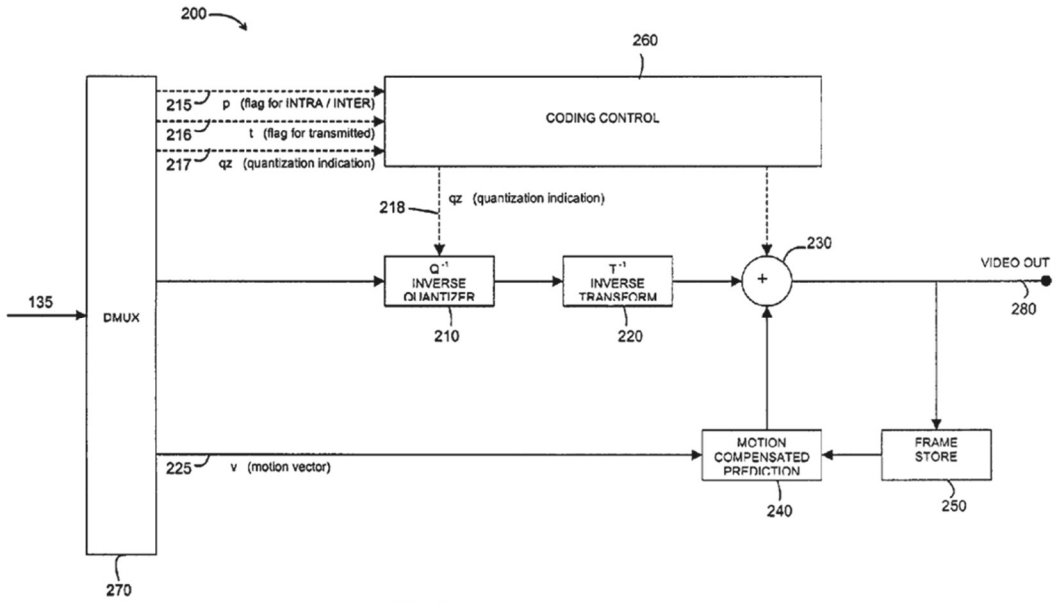
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	level and run values for the non-zero quantized transform coefficients of the prediction error block in question. The video multiplex decoder 270 decodes the variable length codewords using a variable length decoding method corresponding to the encoding method used in the encoder 100 and thereby recovers the level and run values. It then reconstructs an array of quantized transform coefficient values for each prediction error block and passes them to inverse quantizer 210. Control information relating to the INTER-coded macroblock is also decoded in the video multiplex decoder 270 using an appropriate decoding method and is passed to control manager 260. Information relating to the level of quantization applied to the transform coefficients of the prediction error blocks is extracted from the encoded bit-stream and provided to control manager 260 via control line 217. The control manager, in turn, conveys this information to inverse quantizer 210 via control line 218. Inverse quantizer 210 inverse quantizes the quantized DCT coefficients representing the prediction error information for each block of the macroblock according to the control information and provides the now inverse quantized DCT coefficients to inverse DCT transformer 220. The inverse quantized DCT coefficients representing the prediction error information for each block are then inverse transformed in the inverse DCT transformer 220 to yield an array of reconstructed prediction error values for each block of the macroblock. The encoded motion vector information associated with the macroblock is extracted from the encoded video bit-stream 135 by video multiplex decoder 270 and is decoded. The decoded motion vector information thus obtained is passed via control line 225 to motion compensated prediction block 240, which reconstructs a motion vector for the macroblock using the same motion model as that used to encode the INTER-coded macroblock in encoder 100. The reconstructed motion vector approximates the motion vector originally determined by motion estimation block 130 of the encoder. The motion compensated prediction block 240 of the decoder uses the reconstructed motion vector to identify the location of a region of reconstructed pixels in a prediction reference frame stored in frame store 250. The reference frame may be, for example, a previously decoded INTRA-coded frame, or a previously

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	decoded INTER-coded frame. In either case, the region of pixels indicated by the reconstructed motion vector is used to form a prediction for the macroblock in question. More specifically, the motion compensated prediction block 240 forms an array of pixel values for each block of the macroblock by copying corresponding pixel values from the region of pixels identified by the motion vector. The prediction, that is the blocks of pixel values derived from the reference frame, are passed from motion compensated prediction block 240 to combiner 230 where they are combined with the decoded prediction error information. In practice, the pixel values of each predicted block are added to corresponding reconstructed prediction error values output by inverse DCT transformer 220. In this way an array of reconstructed pixel values for each block of the macroblock is obtained. The reconstructed pixel values are passed to the video output 280 of the decoder and are also stored in frame store 250. As subsequent macroblocks of the INTER-coded frame are decoded and stored, a decoded frame is progressively assembled in the frame store 250 and thus becomes available for use as a reference frame for motion-compensated prediction of other INTER-coded frames. The '808 patent, 20:26-42: Operation of a video decoder 700 according to an embodiment of the invention will now be described with reference to FIG. 7. The structure of the video decoder illustrated in FIG. 7 is substantially identical to that of the prior art video decoder shown in FIG. 2, with appropriate modifications to those parts of the decoder that perform motion estimation operations. All parts of the video decoder which implement functions and operate in a manner identical to the previously described prior art video decoder are identified with identical reference numbers. It is further assumed that the video decoder of FIG. 7 corresponds to the encoder described in connection with FIG. 6 and is therefore capable of receiving and decoding the bit-stream 635 transmitted by encoder 600. Furthermore, as the present invention affects the decoding of video frames in INTER-coded format, description of the operations performed by decoder 700 in connection with the decoding of INTRA-coded frames will be omitted.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	The ’808 patent, FIG. 2:  Fig. 2 (PRIOR ART) H.263, § 6.1.1:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	6.1.1 Differential motion vectors The macroblock vector is obtained by adding predictors to the vector differences indicated by MVD (see Table 11). For differential coding with four vectors per macroblock, refer to Annex F. In case of one vector per macroblock, the candidate predictors for the differential coding are taken from three surrounding macroblocks as indicated in Figure 11. The predictors are calculated separately for the horizontal and vertical components. In the special cases at the borders of the current GOB or picture, the following decision rules are applied in increasing order: 1) When the corresponding macroblock was coded in INTRA mode (if not in PB-frames mode) or was not coded (COD = 1), the candidate predictor is set to zero. 2) The candidate predictor MV1 is set to zero if the corresponding macroblock is outside the picture (at the left side). 3) Then, the candidate predictors MV2 and MV3 are set to MV1 if the corresponding macroblocks are outside the picture (at the top) or outside the GOB (at the top) if the GOB header of the current GOB is non-empty. 4) Then, the candidate predictor MV3 is set to zero if the corresponding macroblock is outside the picture (at the right side). For each component, the predictor is the median value of the three candidate predictors for this component. Advantage is taken of the fact that the range of motion vector component values is constrained. Each VLC word for MVD represents a pair of difference values. Only one of the pair will yield a macroblock vector component falling within the permitted range [–16, 15.5]. A positive value of the horizontal or vertical component of the motion vector signifies that the prediction is formed from pixels in the previous picture which are spatially to the right or below the pixels being predicted.
16[c] forming a prediction for the first segment with respect to a reference	The below references, as evidence by the example citations, disclose forming a prediction for the first segment with respect to a reference frame based at least in part on the assigned motion vector for the skip coding mode, wherein the assigned motion vector is one of the zero motion vector and the predicted non-zero motion vector.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
frame based at least in part on the assigned motion vector for the skip coding mode, wherein the assigned motion vector is one of the zero motion vector and the predicted non-zero motion vector.	*See limitation 7[c].* *See, e.g.*, The '808 patent, 4:44-60: In order to illustrate the operation of a generic video coding system in greater detail, reference will now be made to the exemplary video encoder and video decoder illustrated in FIGS. 1 and 2 of the accompanying drawings. The video encoder 100 of FIG. 1 employs a combination of INTRA- and INTER-coding to produce a compressed (encoded) video bit-stream and decoder 200 of FIG. 2 is arranged to receive and decode the video bit-stream produced by encoder 100 in order to produce a reconstructed video sequence. Throughout the following description it will be assumed that the luminance component of a macroblock comprises 16×16 pixels arranged as an array of 4, 8×8 blocks, and that the associated chrominance components are spatially sub-sampled by a factor of two in the horizontal and vertical directions to form 8×8 blocks, as depicted in FIG. 3. Extension of the description to other block sizes and other sub-sampling schemes will be apparent to those of ordinary skill in the art. The '808 patent, 8:19-10:22: Operation of the video decoder 200, shown in FIG. 2 will now be described. The decoder 200 comprises a video multiplex decoder 270, which receives an encoded video bit-stream 135 from the encoder 100 and demultiplexes it into its constituent parts, an inverse quantizer 210, an inverse DCT transformer 220, a motion compensated prediction block 240, a frame store 250, a combiner 230, a control manager 260, and an output 280. The control manager 260 controls the operation of the decoder 200 in response to whether an INTRA- or an INTER-coded frame is being decoded. An INTRA/INTER trigger control signal, which causes the decoder to switch between decoding modes is derived, for example, from

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	picture type information associated with each compressed video frame received from the encoder. The INTRA/INTER trigger control signal is extracted from the encoded video bit-stream by the video multiplex decoder 270 and is passed to control manager 260 via control line 215. Decoding of an INTRA-coded frame is performed on a macroblock-by-macroblock basis, each macroblock being decoded substantially as soon as encoded information relating to it is received in the video bit-stream 135. The video multiplex decoder 270 separates the encoded information for the blocks of the macroblock from possible control information relating to the macroblock in question. The encoded information for each block of an INTRA-coded macroblock comprises variable length codewords representing the entropy coded level and run values for the non-zero quantized DCT coefficients of the block. The video multiplex decoder 270 decodes the variable length codewords using a variable length decoding method corresponding to the encoding method used in the encoder 100 and thereby recovers the level and run values. It then reconstructs the array of quantized transform coefficient values for each block of the macroblock and passes them to inverse quantizer 210. Any control information relating to the macroblock is also decoded in the video multiplex decoder 270 using an appropriate decoding method and is passed to control manager 260. In particular, information relating to the level of quantization applied to the transform coefficients is extracted from the encoded bit-stream by video multiplex decoder 270 and provided to control manager 260 via control line 217. The control manager, in turn, conveys this information to inverse quantizer 210 via control line 218. Inverse quantizer 210 inverse quantizes the quantized DCT coefficients for each block of the macroblock according to the control information and provides the now inverse quantized DCT coefficients to inverse DCT transformer 220. Inverse DCT transformer 220 performs an inverse DCT transform on the inverse quantized DCT coefficients for each block of the macroblock to form a decoded block of image information comprising reconstructed pixel values. The reconstructed pixel values for each block of the macroblock are passed via combiner 230 to the video output 280 of the decoder

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	where, for example, they can be provided to a display device (not shown). The reconstructed pixel values for each block are also stored in frame store 250. Because motion-compensated prediction is not used in the encoding/decoding of INTRA coded macroblocks control manager 260 controls combiner 230 to pass each block of pixel values as such to the video output 280 and frame store 250. As subsequent macroblocks of the INTRA-coded frame are decoded and stored, a decoded frame is progressively assembled in the frame store 250 and thus becomes available for use as a reference frame for motion compensated prediction in connection with the decoding of subsequently received INTER-coded frames. INTER-coded frames are also decoded macroblock by macroblock, each INTER-coded macroblock being decoded substantially as soon as encoded information relating to it is received in the bit-stream 135. The video multiplex decoder 270 separates the encoded prediction error information for each block of an INTER-coded macroblock from encoded motion vector information and possible control information relating to the macroblock in question. As explained in the foregoing, the encoded prediction error information for each block of the macroblock comprises variable length codewords representing the entropy coded level and run values for the non-zero quantized transform coefficients of the prediction error block in question. The video multiplex decoder 270 decodes the variable length codewords using a variable length decoding method corresponding to the encoding method used in the encoder 100 and thereby recovers the level and run values. It then reconstructs an array of quantized transform coefficient values for each prediction error block and passes them to inverse quantizer 210. Control information relating to the INTER-coded macroblock is also decoded in the video multiplex decoder 270 using an appropriate decoding method and is passed to control manager 260. Information relating to the level of quantization applied to the transform coefficients of the prediction error blocks is extracted from the encoded bit-stream and provided to control manager 260 via control line 217. The control manager, in turn, conveys this information to inverse quantizer 210 via control line 218. Inverse quantizer 210 inverse quantizes the quantized DCT coefficients representing the prediction error information

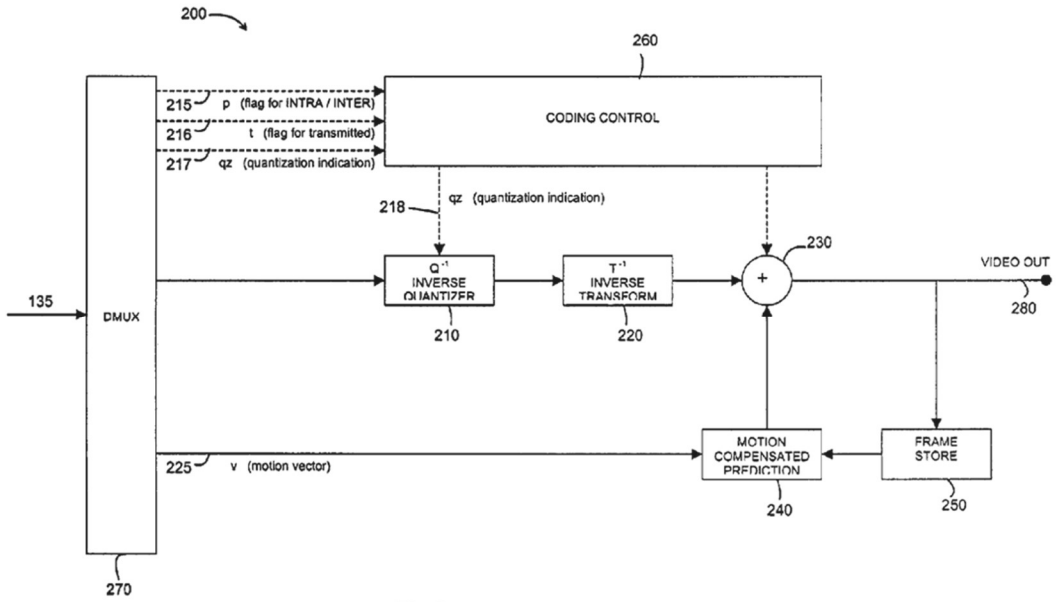
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	for each block of the macroblock according to the control information and provides the now inverse quantized DCT coefficients to inverse DCT transformer 220. The inverse quantized DCT coefficients representing the prediction error information for each block are then inverse transformed in the inverse DCT transformer 220 to yield an array of reconstructed prediction error values for each block of the macroblock. The encoded motion vector information associated with the macroblock is extracted from the encoded video bit-stream 135 by video multiplex decoder 270 and is decoded. The decoded motion vector information thus obtained is passed via control line 225 to motion compensated prediction block 240, which reconstructs a motion vector for the macroblock using the same motion model as that used to encode the INTER-coded macroblock in encoder 100. The reconstructed motion vector approximates the motion vector originally determined by motion estimation block 130 of the encoder. The motion compensated prediction block 240 of the decoder uses the reconstructed motion vector to identify the location of a region of reconstructed pixels in a prediction reference frame stored in frame store 250. The reference frame may be, for example, a previously decoded INTRA-coded frame, or a previously decoded INTER-coded frame. In either case, the region of pixels indicated by the reconstructed motion vector is used to form a prediction for the macroblock in question. More specifically, the motion compensated prediction block 240 forms an array of pixel values for each block of the macroblock by copying corresponding pixel values from the region of pixels identified by the motion vector. The prediction, that is the blocks of pixel values derived from the reference frame, are passed from motion compensated prediction block 240 to combiner 230 where they are combined with the decoded prediction error information. In practice, the pixel values of each predicted block are added to corresponding reconstructed prediction error values output by inverse DCT transformer 220. In this way an array of reconstructed pixel values for each block of the macroblock is obtained. The reconstructed pixel values are passed to the video output 280 of the decoder and are also stored in frame store 250. As subsequent macroblocks of the INTER-coded frame are decoded and stored, a decoded frame is progressively assembled in the

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	frame store 250 and thus becomes available for use as a reference frame for motion-compensated prediction of other INTER-coded frames. The ’808 patent, 20:26-42: Operation of a video decoder 700 according to an embodiment of the invention will now be described with reference to FIG. 7. The structure of the video decoder illustrated in FIG. 7 is substantially identical to that of the prior art video decoder shown in FIG. 2, with appropriate modifications to those parts of the decoder that perform motion estimation operations. All parts of the video decoder which implement functions and operate in a manner identical to the previously described prior art video decoder are identified with identical reference numbers. It is further assumed that the video decoder of FIG. 7 corresponds to the encoder described in connection with FIG. 6 and is therefore capable of receiving and decoding the bit-stream 635 transmitted by encoder 600. Furthermore, as the present invention affects the decoding of video frames in INTER-coded format, description of the operations performed by decoder 700 in connection with the decoding of INTRA-coded frames will be omitted. The ’808 patent, FIG. 2:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	 Fig. 2 (PRIOR ART) H.263, § 6.1.1:

ASSERTED CLAIMS	PRIOR ART DISCLOSURES:

6.1.1 Differential motion vectors

The macroblock vector is obtained by adding predictors to the vector differences indicated by MVD (see Table 11). For differential coding with four vectors per macroblock, refer to Annex F. In case of one vector per macroblock, the candidate predictors for the differential coding are taken from three surrounding macroblocks as indicated in Figure 11. The predictors are calculated separately for the horizontal and vertical components.

In the special cases at the borders of the current GOB or picture, the following decision rules are applied in increasing order:

1) When the corresponding macroblock was coded in INTRA mode (if not in PB-frames mode) or was not coded (COD = 1), the candidate predictor is set to zero.
2) The candidate predictor MV1 is set to zero if the corresponding macroblock is outside the picture (at the left side).
3) Then, the candidate predictors MV2 and MV3 are set to MV1 if the corresponding macroblocks are outside the picture (at the top) or outside the GOB (at the top) if the GOB header of the current GOB is non-empty.
4) Then, the candidate predictor MV3 is set to zero if the corresponding macroblock is outside the picture (at the right side).

For each component, the predictor is the median value of the three candidate predictors for this component.

Advantage is taken of the fact that the range of motion vector component values is constrained. Each VLC word for MVD represents a pair of difference values. Only one of the pair will yield a macroblock vector component falling within the permitted range [–16, 15.5]. A positive value of the horizontal or vertical component of the motion vector signifies that the prediction is formed from pixels in the previous picture which are spatially to the right or below the pixels being predicted.

Kuriki, [0002], [0004], [0008]:

[Prior art] An encoding apparatus for compression-encoding moving image data by the MPEG method compresses moving image data by performing inter-frame prediction by motion compensation (hereinafter, referred to as motion compensated prediction). The frame of the past of a frame, or the future (or the both) to which an object block belongs with motion compensation prediction about the block (it is hereafter called an object block) of the coding subject in a video data (hereinafter, referred to as a reference frame), and obtains a difference

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	(hereinafter, referred to as a prediction error) of each pixel between the target block and the reference block, and a motion vector indicating a relative positional relationship between both blocks. Typically, motion compensated prediction is performed on a macroblock basis. … Here, the encoding type will be described. There are three kinds of encoding types, i.e., I picture, P picture, and B picture, and any one of the three kinds of encoding types is determined for each frame, and each frame is encoded by a different encoding method according to the encoding type. In a frame of an I picture, a luminance signal and two color difference signals of a macro block are subjected to DCT, quantization and variable length coding without performing motion compensation prediction. The I-picture frame serves as a reference frame of a frame of another encoding type. A frame of a P picture is motion-compensated and predicted using a frame of a past I picture or P picture as a reference frame, and a prediction error after the motion-compensated prediction is subjected to DCT, quantization, and variable length coding. The frame of the P picture serves as a reference frame of a macroblock of another P picture or B picture. The encoding method of the P picture is called unidirectional prediction. The frame of the B picture is motion-compensated and predicted using the frame of the past or future (or both) I picture or P picture as a reference frame, and the resulting prediction error is subjected to DCT, quantization, and variable length coding. It does not become a reference frame for other frames. The B-picture encoding method is called bidirectional prediction because it is predicted from both the past and future directions …. When a decoding device for decoding moving image data detects that there is a skip macroblock from an address of a macroblock, the decoding device performs: The P picture is decoded by using a block at the same position as the skip macro block in the reference frame of the picture, and the B picture is decoded by using the motion vector of the left adjacent macro

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	block. Lee, 63-64: Thus inter coding can be performed according to one of the following 15 modes of operation: SKIP: The current MB is replaced by the MB at the same spatial location in the previous reconstructed picture. Encoding is performed by skipping the current MB and incrementing the MB address. This mode is designed for areas in the picture where little or no change relative to the previously reconstructed picture is detected. FR-PMV: One motion vector for the current MB is predicted and used as an estimate. Motion vector searching is not performed. As only motion compensation is required, the MB is encoded using the header and the motion vector bits. When motion vectors can be accurately predicted, this mode becomes a likely candidate.
20. A decoder according to claim 16, wherein if a segment in a region surrounding the first segment has zero motion vector, the zero motion vector is assigned for the skip coding mode of the first segment, and the prediction for the first segment is formed with respect to a corresponding segment of the	The below references, as evidence by the example citations, disclose that if a segment in a region surrounding the first segment has zero motion vector, the zero motion vector is assigned for the skip coding mode of the first segment, and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector. *See, e.g.*, *See claim 6.*

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
reference frame associated with the zero motion vector.	
21. A multimedia terminal, comprising an encoder according to claim 10.	The below references, as evidence by the example citations, disclose a multimedia terminal, comprising an encoder according to claim 10. *See, e.g.*, Shachar, Abstract: > In a video system incoming video having a given frame size is sent over a video transmission system that supports a different frame size. When a transmitting terminal in the transmission system receives the incoming video, the terminal does not scale the video to fit the transmitted frame size. Instead, the video compression encoder only encodes and sends the data associated with the incoming video. The encoder does not encode or send the rest of the standard transmitted frame. At a receiving terminal in the transmission system, all of the received data is decoded. However, because the decoded data will correspond to the original incoming frame size, this data, rather than the entire transmitted frame, is scaled to match the size of the display or the target window. Shachar, 3:22-4:5: > FIG. 1 is a block and graphical diagram illustrating some of the basic operating principles of one embodiment of a video system S constructed according to the invention. The video system S includes a video source 20 that sends a video stream to a video destination 22 via an encoder 24 and a decoder 26. > The data stream from the video source 20 is associated with a particular format, designated in FIG. 1 as a source format 28. The source format 28 specifies a frame size that typically is

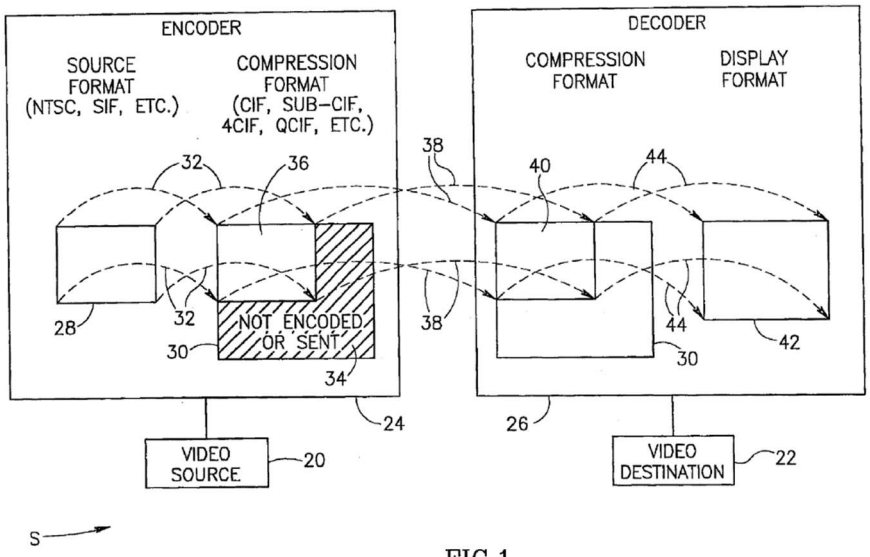
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	defined in terms of rows and columns of pixels. The encoder 24 compresses the data stream and sends the compressed video stream to the decoder 26. The compressed video stream is defined in another format 30, designated as a compression format, that specifies a frame size that is larger than the frame size of the source format 28. As represented by lines 32 in FIG. 1, the operation of compressing the data stream and sending it in the other format may include, conceptually, a mapping of the source format frame 28 into the compression format frame 30. Due to the differences in the frame sizes, there are numerous data areas 34 in the compression frame 30 that are not associated with any of the pixels in the source frame 28. In accordance with the invention, the encoder 24 only encodes the data associated with the source format 28. That is, the data in block 36. The portion 34 of the compression frame 30 not associated with the source format (the shaded portion 34 of the frame 30) is not encoded. As represented by lines 38, the encoder 24 only sends the encoded data 36 to the decoder 26. The decoder 26 decompresses the received video stream and provides it to the video destination 22. However, since the decoder 26 is set up to handle the larger frames 30, the frame 30 is, in effect, only partially "filled." Thus, the decoder 26 must map this portion 40 of the frame 30 (rather than the entire frame 30) to the display format 42. The display format 42 represents the size of the display screen or the size of the window in the display screen within which the video is to be displayed. Thus, as represented by lines 44, after the data from the "filled" portion 40 of the frame 30 is decompressed, the decoder 26 scales it to fit the display format 42. FIG. 2 illustrates one embodiment of a system S that sends a video stream from an NTSC camera 50 to a display monitor 52 via a CIF-based video encoder 54 and decoder 56. The encoder 54 may be used to transmit video in a video conferencing system (see, for example,

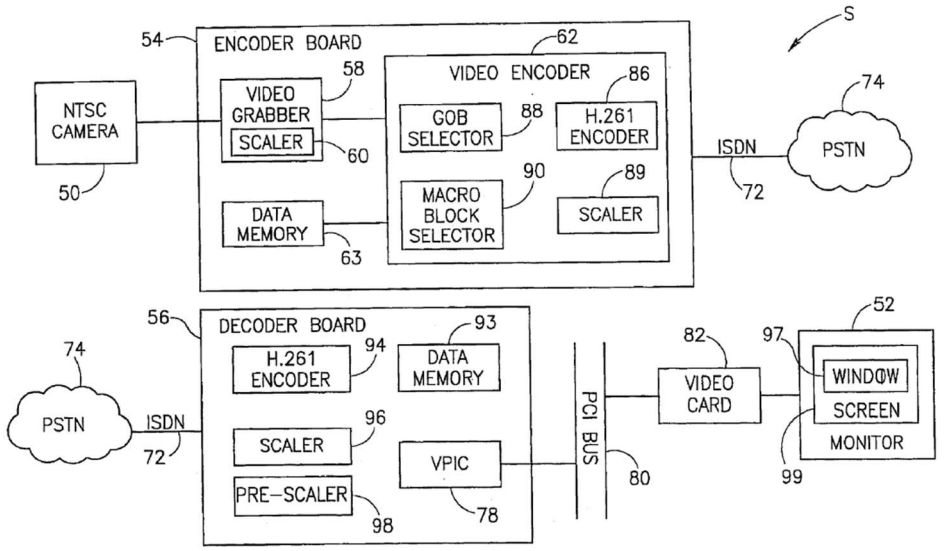
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	FIG. 8). It converts video frames from the camera 50 into a compressed data stream. The decoder 56 may be used to receive video in the video conferencing system. It converts the compressed data stream into video frames that are sent to the monitor 52. Shachar, 11:1-24: The video stations discussed above may be implemented to support a variety of standards including H.321, H.322, H.323 and H.324. Under these standards, video may be provided according to the H.261 standard or standards such as H.263, H.263+ or H.263L as illustrated by station B 100B in FIG. 8. These standards support several CIF-based frame definitions including CIF, QCIF, SUB-CIF and 4CIF. Details of these standards may be found, for example, in the following references, the contents of which are hereby incorporated herein by reference. "Recommendation H.263 (03/96)—Video Coding for Low Bit Rate Communication." "Recommendation H.321 (03/96)—Adaptation of H.320 Visual Telephone Terminals to B-ISDN Environments." "Recommendation H.322 (03/96)—Visual Telephone Systems and Terminal Equipment for Local Area Networks Which Provide a Guaranteed Quality of Service." "Recommendation H.323 (11/96)—Visual Telephone Systems and Equipment for Local Area Networks Which Provide a Non-Guaranteed Quality of Service." "Recommendation H.324 (03/96)—Terminal for Low Bit Rate Multimedia Communication." "Recommendation H.230 (07/95)—Frame-Synchronous Control and Indication Signals for Audiovisual Systems," the contents of which is hereby incorporated herein by reference. Shachar, Figs. 1-2:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	 FIG.1

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	 FIG.2 Nakaya, Fig. 14, 11:64-12:47 Specific examples of coders and decoders using the coding method described in this specification is shown in FIG. 14. The image coding and decoding method can be utilized by installing image coding and decoding software into a omputer 1401. This software is recorded in some kind of storage media (CD-ROM, floppy disk, hard disk, etc.) 1412, loaded into a computer and then used. Additionally, the computer can be used as an image communication terminal by connecting the computer to a communication lines. It is also possible to install the decoding method described in this specification into a player device 1403 that reads and decodes the coded bit stream recorded in a storage media 1402. In this case, the reconstructed image signal can be displayed on a television monitor 1404. The device 1403 can be used only

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	for reading the coded bit stream, and in this case, the decoding device can be installed in the television monitor 1404. It is well known that digital data transmission can be realized using satellites and terrestrial waves. A decoding device can also be installed in a television receiver 1405 capable of receiving such digital transmissions. Also, a decoding device can also be installed inside a set top box 1409 connected to a satellite/terrestrial wave antenna, or a cable 1408 of a cable television system, so that the reconstructed images can be displayed on a television monitor 1410. In this case, the decoding device can be incorporated in the television monitor rather than in the set top box, as in the case of 1404. The layout of a digital satellite broadcast system is shown in 1413, 1414 and 1415. The video information in the coded bit stream is transmitted from a broadcast station 1413 to a communication or broadcast satellite 1414. The satellite receives this information, sends it to a home 1415 having equipment for receiving satellite broadcast programs, and the video information is reconstructed and displayed in this home using devices such as a television receiver or a set top box. Digital image communication using mobile terminals 1406 has recently attracted considerable attention, due to the fact that image communication at very low bit rates has become possible. Digital portable terminals can be categorized in the following three types: a transceiver having both an encoder and decoder; a transmitter having only an encoder; and a receiver having only a decoder. An encoding device can be installed in a video camera recorder 1407. The camera can also be used just for capturing the video signal and this signal can be supplied to a custom encoder 1411. All of the devices or systems shown in this drawing can be equipped with the coding or/and decoding method described in this specification. By using this coding or/and decoding method in these devices or systems, images of higher quality compared with those obtained using conventional technologies can be obtained. Sugahara, 8:12-14. A compressed data processing apparatus according to the present invention for reduction of the picture updating frequency of an MPEG data stream can be configured . . .

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
22. A multimedia terminal comprising a decoder according to claim 16.	The below references, as evidence by the example citations, disclose a multimedia terminal comprising a decoder according to claim 16. *See, e.g.*, Shachar, Abstract: > In a video system incoming video having a given frame size is sent over a video transmission system that supports a different frame size. When a transmitting terminal in the transmission system receives the incoming video, the terminal does not scale the video to fit the transmitted frame size. Instead, the video compression encoder only encodes and sends the data associated with the incoming video. The encoder does not encode or send the rest of the standard transmitted frame. At a receiving terminal in the transmission system, all of the received data is decoded. However, because the decoded data will correspond to the original incoming frame size, this data, rather than the entire transmitted frame, is scaled to match the size of the display or the target window. Shachar, 3:22-4:5: > FIG. 1 is a block and graphical diagram illustrating some of the basic operating principles of one embodiment of a video system S constructed according to the invention. The video system S includes a video source 20 that sends a video stream to a video destination 22 via an encoder 24 and a decoder 26. > The data stream from the video source 20 is associated with a particular format, designated in FIG. 1 as a source format 28. The source format 28 specifies a frame size that typically is defined in terms of rows and columns of pixels.

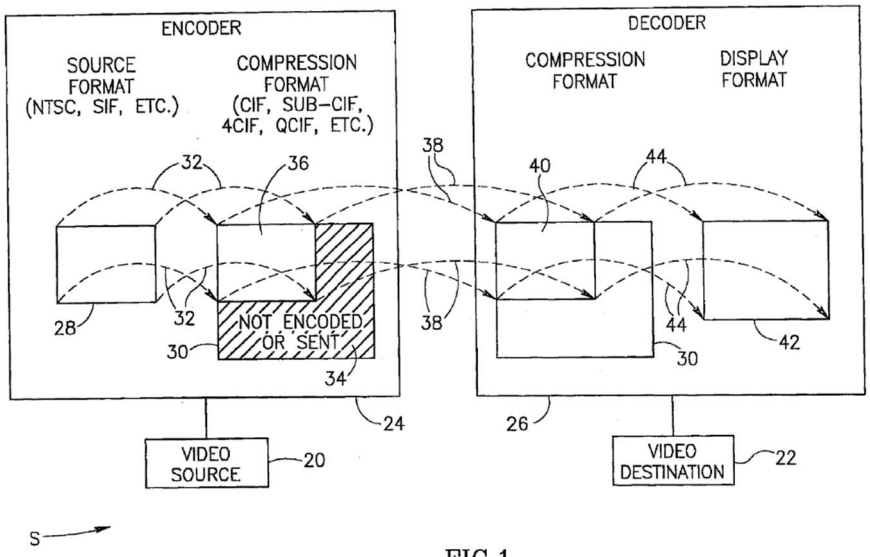
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	The encoder 24 compresses the data stream and sends the compressed video stream to the decoder 26. The compressed video stream is defined in another format 30, designated as a compression format, that specifies a frame size that is larger than the frame size of the source format 28. As represented by lines 32 in FIG. 1, the operation of compressing the data stream and sending it in the other format may include, conceptually, a mapping of the source format frame 28 into the compression format frame 30. Due to the differences in the frame sizes, there are numerous data areas 34 in the compression frame 30 that are not associated with any of the pixels in the source frame 28. In accordance with the invention, the encoder 24 only encodes the data associated with the source format 28. That is, the data in block 36. The portion 34 of the compression frame 30 not associated with the source format (the shaded portion 34 of the frame 30) is not encoded. As represented by lines 38, the encoder 24 only sends the encoded data 36 to the decoder 26. The decoder 26 decompresses the received video stream and provides it to the video destination 22. However, since the decoder 26 is set up to handle the larger frames 30, the frame 30 is, in effect, only partially "filled." Thus, the decoder 26 must map this portion 40 of the frame 30 (rather than the entire frame 30) to the display format 42. The display format 42 represents the size of the display screen or the size of the window in the display screen within which the video is to be displayed. Thus, as represented by lines 44, after the data from the "filled" portion 40 of the frame 30 is decompressed, the decoder 26 scales it to fit the display format 42. FIG. 2 illustrates one embodiment of a system S that sends a video stream from an NTSC camera 50 to a display monitor 52 via a CIF-based video encoder 54 and decoder 56. The encoder 54 may be used to transmit video in a video conferencing system (see, for example, FIG. 8). It converts video frames from the camera 50 into a compressed data stream. The decoder 56 may be used to receive video in the video conferencing system. It converts the

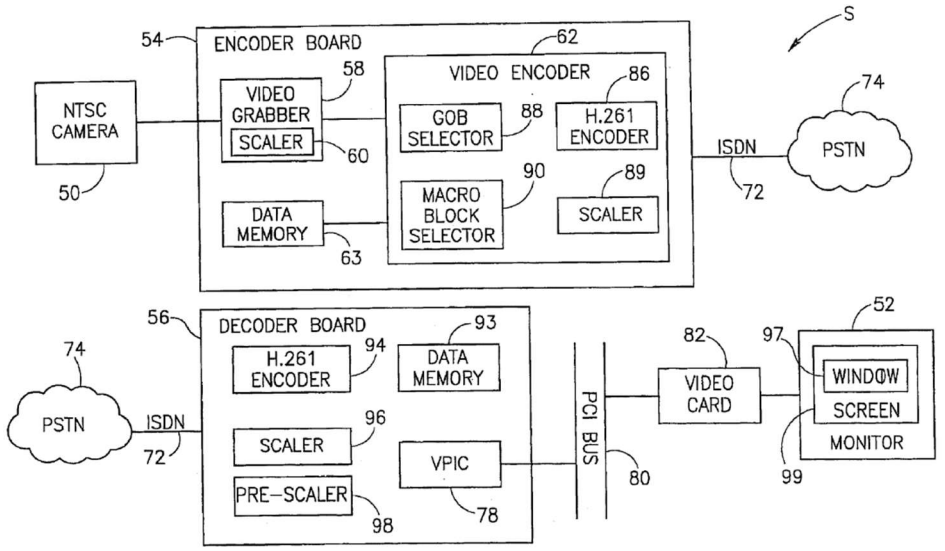
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	compressed data stream into video frames that are sent to the monitor 52. Shachar, 11:1-24: The video stations discussed above may be implemented to support a variety of standards including H.321, H.322, H.323 and H.324. Under these standards, video may be provided according to the H.261 standard or standards such as H.263, H.263+ or H.263L as illustrated by station B 100B in FIG. 8. These standards support several CIF-based frame definitions including CIF, QCIF, SUB-CIF and 4CIF. Details of these standards may be found, for example, in the following references, the contents of which are hereby incorporated herein by reference. "Recommendation H.263 (03/96)—Video Coding for Low Bit Rate Communication." "Recommendation H.321 (03/96)—Adaptation of H.320 Visual Telephone Terminals to B-ISDN Environments." "Recommendation H.322 (03/96)—Visual Telephone Systems and Terminal Equipment for Local Area Networks Which Provide a Guaranteed Quality of Service." "Recommendation H.323 (11/96)—Visual Telephone Systems and Equipment for Local Area Networks Which Provide a Non-Guaranteed Quality of Service." "Recommendation H.324 (03/96)—Terminal for Low Bit Rate Multimedia Communication." "Recommendation H.230 (07/95)—Frame-Synchronous Control and Indication Signals for Audiovisual Systems," the contents of which is hereby incorporated herein by reference. Shachar, Figs. 1-2:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	 FIG.1

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	 FIG.2 Nakaya, Fig. 14, 11:64-12:47 Specific examples of coders and decoders using the coding method described in this specification is shown in FIG. 14. The image coding and decoding method can be utilized by installing image coding and decoding software into a omputer 1401. This software is recorded in some kind of storage media (CD-ROM, floppy disk, hard disk, etc.) 1412, loaded into a computer and then used. Additionally, the computer can be used as an image communication terminal by connecting the computer to a communication lines. It is also possible to install the decoding method described in this specification into a player device 1403 that reads and

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	decodes the coded bit stream recorded in a storage media 1402. In this case, the reconstructed image signal can be displayed on a television monitor 1404. The device 1403 can be used only for reading the coded bit stream, and in this case, the decoding device can be installed in the television monitor 1404. It is well known that digital data transmission can be realized using satellites and terrestrial waves. A decoding device can also be installed in a television receiver 1405 capable of receiving such digital transmissions. Also, a decoding device can also be installed inside a set top box 1409 connected to a satellite/terrestrial wave antenna, or a cable 1408 of a cable television system, so that the reconstructed images can be displayed on a television monitor 1410. In this case, the decoding device can be incorporated in the television monitor rather than in the set top box, as in the case of 1404. The layout of a digital satellite broadcast system is shown in 1413, 1414 and 1415. The video information in the coded bit stream is transmitted from a broadcast station 1413 to a communication or broadcast satellite 1414. The satellite receives this information, sends it to a home 1415 having equipment for receiving satellite broadcast programs, and the video information is reconstructed and displayed in this home using devices such as a television receiver or a set top box. Digital image communication using mobile terminals 1406 has recently attracted considerable attention, due to the fact that image communication at very low bit rates has become possible. Digital portable terminals can be categorized in the following three types: a transceiver having both an encoder and decoder; a transmitter having only an encoder; and a receiver having only a decoder. An encoding device can be installed in a video camera recorder 1407. The camera can also be used just for capturing the video signal and this signal can be supplied to a custom encoder 1411. All of the devices or systems shown in this drawing can be equipped with the coding or/and decoding method described in this specification. By using this coding or/and decoding method in these devices or systems, images of higher quality compared with those obtained using conventional technologies can be obtained. Sugahara, 8:12-14.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	A compressed data processing apparatus according to the present invention for reduction of the picture updating frequency of an MPEG data stream can be configured . . .
23[preamble] A method according to claim 1, wherein if the second segment has a non-zero motion vector,	The below references, as evidence by the example citations, disclose that the second segment has a non-zero motion vector. *See, e.g.*, Hwang, 3:25-35: A current frame and a previous frame (in other words, a search frame and a reference frame) of a video signal are inputted to a motion vector detection block 100 and a full search block 200. At the motion vector detection block 100, to find a motion vector of a search block, i.e., a block currently being processed, motion vectors of processed neighboring blocks of the search block together with a 0 vector are examined to select a candidate motion vector, wherein processed blocks refers to blocks whose motion vectors are determined and the processed neighboring blocks are processed blocks neighboring the search block. Hwang, 3:36-56: The processed neighboring blocks whose motion vectors are utilized in detecting the motion vector of the search block B(i,j) are exemplified in FIG. 4. As shown in FIG. 4, the search frame consists of a multiplicity of slices, each of which includes a number of blocks, the number of slices and the number of blocks in each slice being N2 and N1, respectively. The search frame are processed from the upper left corner to the lower right corner. Therefore, among 8 neighboring blocks surrounding the search block B(i,j), motion vectors of 4 neighboring blocks, i.e., an upper left block B(i-1, j-1), an upper middle block B(i,j-1), an

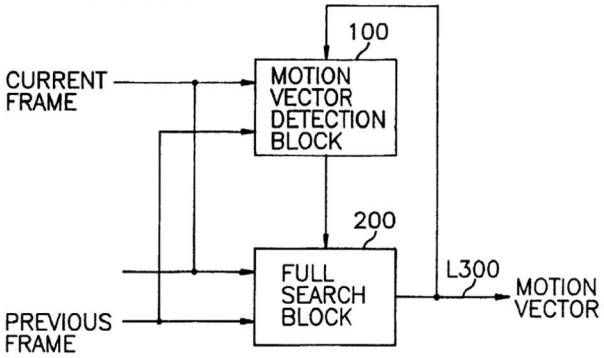
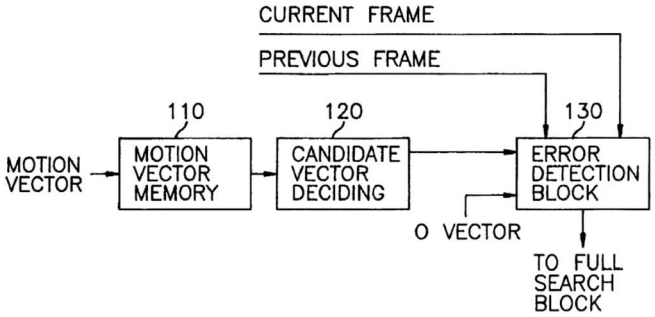
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	upper right block B(i+1,j-1), and a middle left block B(i-1,j), are known when the search block is processed, wherein j represents a slice number and i designates a location of a block in a slice, i and j being positive integers not larger than N1 and N2, respectively. It can be easily known that, if a search block is not located on the boundary of a frame, the number of processed neighboring blocks is 4. In case the search block is on the boundary as in the case of B(1,1), B(1,2) and so on, the number of processed neighboring blocks may be less than 4. Hwang, 3:57-4:12: After the candidate motion vector is determined, a distortion between the search block and a predicted block corresponding to the candidate motion vector is compared with a predetermined threshold, wherein a predicted block corresponding to a vector is determined as a block of the reference frame which is displaced from the search block by the vector. If the distortion between the search block and the predicted block corresponding to the candidate motion vector is smaller than the threshold, the candidate motion vector is decided as a motion vector of the search block and provided on a line L300 through the full search block 200. Otherwise, a full search trigger signal is applied to the full search block 200 which detects a motion vector of the search block by using a full search block matching method in response to the full search trigger signal. The full search block 200 provides either the motion vector provided from the motion vector detection block 100 or the motion vector determined therein. The motion vector provided from the full search block 200 is fed back to the motion vector detection block 100, to be used in detecting motion vectors of subsequent blocks, e.g., B(i+1,j), of the current frame. Hwang, 4:33-50: Referring to FIG. 2, there is provided a detailed block diagram of the motion vector detection block 100 shown in FIG. 1. The motion vectors of the processed blocks are fed to a motion vector memory 110, to be stored therein. Among them, neighboring vectors which refer to

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	motion vectors of the processed neighboring blocks are selected and coupled to a candidate vector deciding block 120. Referring again to FIG. 4, when the search block B(i,j) is being processed, at least motion vectors of the blocks B(i-1, j-1) to B(N1, j-1) and B(1,j) to B(i-1,j) should be stored at the motion vector memory 110. (Note that B(i, j-1) to B(N1, j-1) are necessary in determining motion vector of remaining blocks, i.e., B(i+1, j) to B(N1, j) included in a jth slice; and B(1, j) to B(i-1, j) are used in determining motion vectors of blocks included in a (j+1)st slice.) Therefore, the motion vector memory 110 should at least have (N1+1) memory spaces each of which can accommodate a motion vector of a processed block. Hwang, 5:11-27: Referring to FIG. 4, in case the number of processed neighboring blocks is 1, (for example, a search block B(2,1)) the motion vector of the processed neighboring block (B(1,1)) may be decided as both of the X and the Y vectors. At the error detection block 130, a distortion between the search block and each of three predicted blocks corresponding to the three candidate vectors inputted thereto is determined, wherein the distortion is a value which represents a difference between two blocks. Of the three candidate vectors, one with a minimum distortion is selected as the candidate motion vector. If the minimum distortion of the candidate motion vector is smaller than the threshold TH, the candidate motion vector is determined as the final motion vector of the search block. Accordingly, a procedure for detecting a motion vector of the search block is completed and the motion vector is provided on L300 through the full search block 200. Hwang, Figs. 1-4:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	FIG. 1  *FIG. 2* 

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:

FIG. 3

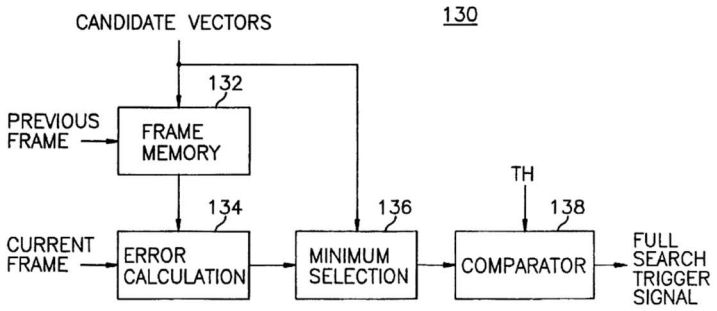
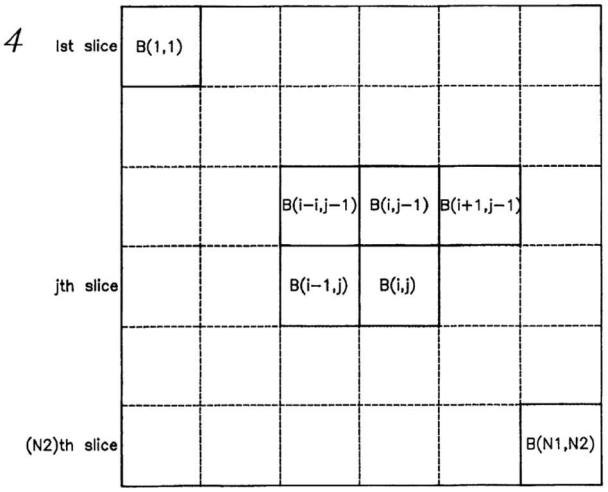


FIG. 4



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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	H.263, § 6.1.1: **6.1.1 Differential motion vectors** The macroblock vector is obtained by adding predictors to the vector differences indicated by MVD (see Table 11). For differential coding with four vectors per macroblock, refer to Annex F. In case of one vector per macroblock, the candidate predictors for the differential coding are taken from three surrounding macroblocks as indicated in Figure 11. The predictors are calculated separately for the horizontal and vertical components. In the special cases at the borders of the current GOB or picture, the following decision rules are applied in increasing order: 1) When the corresponding macroblock was coded in INTRA mode (if not in PB-frames mode) or was not coded (COD = 1), the candidate predictor is set to zero. 2) The candidate predictor MV1 is set to zero if the corresponding macroblock is outside the picture (at the left side). 3) Then, the candidate predictors MV2 and MV3 are set to MV1 if the corresponding macroblocks are outside the picture (at the top) or outside the GOB (at the top) if the GOB header of the current GOB is non-empty. 4) Then, the candidate predictor MV3 is set to zero if the corresponding macroblock is outside the picture (at the right side). For each component, the predictor is the median value of the three candidate predictors for this component. Advantage is taken of the fact that the range of motion vector component values is constrained. Each VLC word for MVD represents a pair of difference values. Only one of the pair will yield a macroblock vector component falling within the permitted range [–16, 15.5]. A positive value of the horizontal or vertical component of the motion vector signifies that the prediction is formed from pixels in the previous picture which are spatially to the right or below the pixels being predicted. Kuriki, [0005-0006], [0026-0028]:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	In addition to the above-described series of operations, the encoding apparatus performs an operation of skipping the variable length encoding when the quantization block or the motion vector has the same value as that of the adjacent macroblock or the macroblock at the same position in the previous or subsequent frame, which is referred to as a macroblock skip. Here, a macroblock that is skipped is referred to as a skipped macroblock. More specifically, in the case of a P picture, the encoding device performs the macroblock skip on a macroblock in which the quantization block is 0, that is, all the quantized DCT coefficients in the quantization block are 0 and the motion vector thereof is 0, and In the case of a B picture, the quantization block is 0, and the macroblock skip is performed for a macroblock whose motion vector is the same in magnitude and direction as the motion vector of the left adjacent macroblock of the current macroblock. However, the encoding apparatus sets the start and end of the slice to no macroblock skipping of the located macroblock is performed. … On the other hand, if it is determined in step 23 that the current macroblock is a B picture, the skip determination unit 120 calculates the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock, and determines whether or not the difference is equal to or smaller than the threshold value b (step 26). Here the previous the macro block means a macro block which is an encoding target immediately before the encoding target macro block. In a frame, it is usually a macroblock located on the left side of a macroblock to be encoded. Also, it is assumed that the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is calculated for each of the x component and the y component, and the skip determination unit 120 performs threshold determination for each of the x component and the y component of the difference. That is, the skip determination unit 120 determines whether both the x component and the y component of the difference are equal to or smaller than the threshold value b or whether one or both of the x component and the y component are larger

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	than the threshold value b. It is assumed that the determination in step 26 includes that the direction of prediction (forward prediction, backward prediction, bidirectional prediction, or the like) is the same between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock, that is, the reference frame is the same When it is determined in step 26 that both the x component and the y component of the difference are equal to or smaller than the threshold value b, the skip determination unit 120 determines that the macroblock is a skip macroblock (step 25). The skip determination unit 120 notifies the variable length coding unit 110, the motion vector replacement unit 121, and the addition unit 108 that the macroblock is determined to be a skip macroblock. In this way, in the case of a B picture, the skip determination unit 120 determines that the macroblock is a skip macroblock when the macroblock is not the first or last macroblock of the slice, the quantized block is 0, and the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is equal to or less than the threshold value b in both the x component and the y component. In the present embodiment, the threshold value b is 1.0. That is, when the skip determination unit 120 determines that both the x component and the y component of the motion vector difference between the current macroblock and the immediately preceding macroblock are equal to or smaller than 1.0, it determines that the current macroblock is a skip macroblock. If it is 1.0 or less, as in the case of the P picture, even if the coding of the macro block is omitted, the difference between the original image and the reproduced image is hardly noticeable to the human visual sense, so that there is substantially no problem. Note that the threshold value a and the threshold value b are not limited to 0.5 and 1.0, and, for example, the user may be allowed to set arbitrary values in the skip determination unit 120 within a range in which deterioration in image quality is allowable. Sugahara, 13:1-8.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	With a second mode of operation of this embodiment, referring to FIG. 6, in addition to such conversion of each B-picture, each P-picture 32 is also converted by the stream portion changeover section 25 such that all of the macroblocks become skipped macroblocks with forward prediction, i.e., the MPEG data of the P-picture 31 are re-encoded as code which expresses a copy of the preceding reference picture. Sugahara, 17:20-29. For example, if the second mode of processing described above is modified such that each P-picture copy stream portion and B-picture copy stream portion specifies a picture as having a fixed non-zero motion vector in a fixed direction, and all of the P and B-pictures of a GOP are subjected to copy data replacement, then the result will be that the final displayed picture will be successively shifted across the display screen, in the direction of the motion vector, when that GOP is decoded and a resultant video signal generated. Sugahara, 21:50-67. wherein said stream is an MPEG compressed video data stream in which each of said reference pictures is an I-picture or a P-picture and each of said predictively encoded pictures is a P-picture or a B-picture, each of said pictures for which prediction information is replaced is a B-picture, and wherein said copy data set includes motion vector information indicating that an overall amount of picture motion of a B-picture with respect to a corresponding temporally preceding reference picture or with respect to a corresponding temporally succeeding reference picture is zero and motion compensated prediction error information indicating that respective amounts of motion compensated prediction error for all macroblocks of said B-picture are zero, to thereby specify all macroblocks of said B-picture as being skipped macroblocks.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
23[a] the method further comprising deriving the predicted non-zero motion vector based at least in part on the motion vector of the second segment; and	The below references, as evidence by the example citations, disclose deriving the predicted non-zero motion vector based at least in part on the motion vector of the second segment. *See, e.g.*, Hwang, 3:25-35: A current frame and a previous frame (in other words, a search frame and a reference frame) of a video signal are inputted to a motion vector detection block 100 and a full search block 200. At the motion vector detection block 100, to find a motion vector of a search block, i.e., a block currently being processed, motion vectors of processed neighboring blocks of the search block together with a 0 vector are examined to select a candidate motion vector, wherein processed blocks refers to blocks whose motion vectors are determined and the processed neighboring blocks are processed blocks neighboring the search block. Hwang, 3:36-56: The processed neighboring blocks whose motion vectors are utilized in detecting the motion vector of the search block B(i,j) are exemplified in FIG. 4. As shown in FIG. 4, the search frame consists of a multiplicity of slices, each of which includes a number of blocks, the number of slices and the number of blocks in each slice being N2 and N1, respectively. The search frame are processed from the upper left corner to the lower right corner. Therefore, among 8 neighboring blocks surrounding the search block B(i,j), motion vectors of 4 neighboring blocks, i.e., an upper left block B(i-1, j-1), an upper middle block B(i,j-1), an upper right block B(i+1,j-1), and a middle left block B(i-1,j), are known when the search block is processed, wherein j represents a slice number and i designates a location of a block in a slice, i and j being positive integers not larger than N1 and N2, respectively. It can be easily known that, if a search block is not located on the boundary of a frame, the number of processed neighboring blocks is 4. In case the search block is on the boundary as in the case of

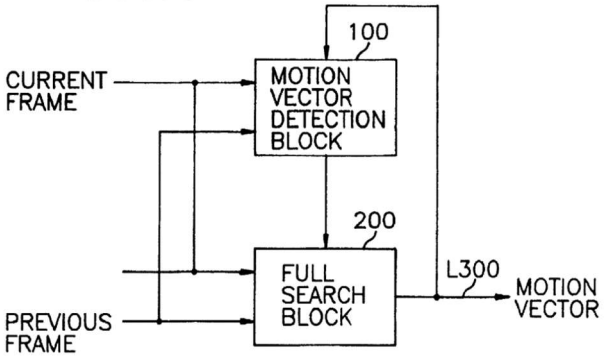
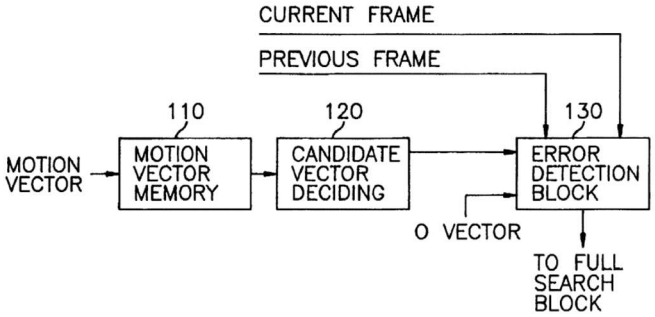
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	B(1,1), B(1,2) and so on, the number of processed neighboring blocks may be less than 4. Hwang, 3:57-4:12: After the candidate motion vector is determined, a distortion between the search block and a predicted block corresponding to the candidate motion vector is compared with a predetermined threshold, wherein a predicted block corresponding to a vector is determined as a block of the reference frame which is displaced from the search block by the vector. If the distortion between the search block and the predicted block corresponding to the candidate motion vector is smaller than the threshold, the candidate motion vector is decided as a motion vector of the search block and provided on a line L300 through the full search block 200. Otherwise, a full search trigger signal is applied to the full search block 200 which detects a motion vector of the search block by using a full search block matching method in response to the full search trigger signal. The full search block 200 provides either the motion vector provided from the motion vector detection block 100 or the motion vector determined therein. The motion vector provided from the full search block 200 is fed back to the motion vector detection block 100, to be used in detecting motion vectors of subsequent blocks, e.g., B(i+1,j), of the current frame. Hwang, 4:33-50: Referring to FIG. 2, there is provided a detailed block diagram of the motion vector detection block 100 shown in FIG. 1. The motion vectors of the processed blocks are fed to a motion vector memory 110, to be stored therein. Among them, neighboring vectors which refer to motion vectors of the processed neighboring blocks are selected and coupled to a candidate vector deciding block 120. Referring again to FIG. 4, when the search block B(i,j) is being processed, at least motion vectors of the blocks B(i-1, j-1) to B(N1, j-1) and B(1,j) to B(i-1,j) should be stored at the

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	motion vector memory 110. (Note that B(i, j-1) to B(N1, j-1) are necessary in determining motion vector of remaining blocks, i.e., B(i+1, j) to B(N1, j) included in a jth slice; and B(1, j) to B(i-1, j) are used in determining motion vectors of blocks included in a (j+1)st slice.) Therefore, the motion vector memory 110 should at least have (N1+1) memory spaces each of which can accommodate a motion vector of a processed block. Hwang, 5:11-27: Referring to FIG. 4, in case the number of processed neighboring blocks is 1, (for example, a search block B(2,1)) the motion vector of the processed neighboring block (B(1,1)) may be decided as both of the X and the Y vectors. At the error detection block 130, a distortion between the search block and each of three predicted blocks corresponding to the three candidate vectors inputted thereto is determined, wherein the distortion is a value which represents a difference between two blocks. Of the three candidate vectors, one with a minimum distortion is selected as the candidate motion vector. If the minimum distortion of the candidate motion vector is smaller than the threshold TH, the candidate motion vector is determined as the final motion vector of the search block. Accordingly, a procedure for detecting a motion vector of the search block is completed and the motion vector is provided on L300 through the full search block 200. Hwang, Figs. 1-4:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	FIG. 1  *FIG. 2* 

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:

FIG. 3

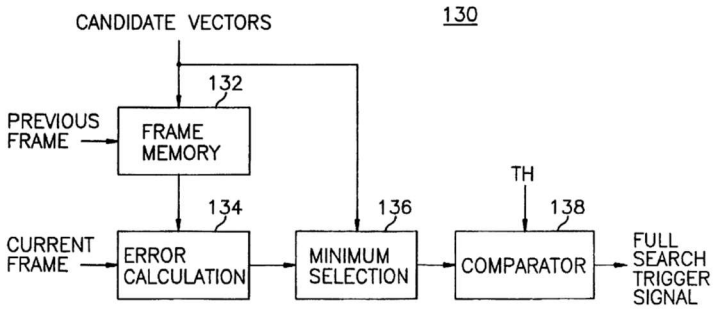
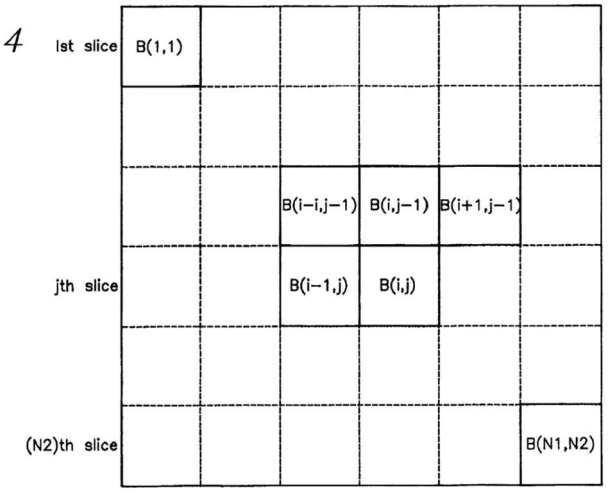


FIG. 4



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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	H.263, § 6.1.1: **6.1.1 Differential motion vectors** The macroblock vector is obtained by adding predictors to the vector differences indicated by MVD (see Table 11). For differential coding with four vectors per macroblock, refer to Annex F. In case of one vector per macroblock, the candidate predictors for the differential coding are taken from three surrounding macroblocks as indicated in Figure 11. The predictors are calculated separately for the horizontal and vertical components. In the special cases at the borders of the current GOB or picture, the following decision rules are applied in increasing order: 1) When the corresponding macroblock was coded in INTRA mode (if not in PB-frames mode) or was not coded (COD = 1), the candidate predictor is set to zero. 2) The candidate predictor MV1 is set to zero if the corresponding macroblock is outside the picture (at the left side). 3) Then, the candidate predictors MV2 and MV3 are set to MV1 if the corresponding macroblocks are outside the picture (at the top) or outside the GOB (at the top) if the GOB header of the current GOB is non-empty. 4) Then, the candidate predictor MV3 is set to zero if the corresponding macroblock is outside the picture (at the right side). For each component, the predictor is the median value of the three candidate predictors for this component. Advantage is taken of the fact that the range of motion vector component values is constrained. Each VLC word for MVD represents a pair of difference values. Only one of the pair will yield a macroblock vector component falling within the permitted range [–16, 15.5]. A positive value of the horizontal or vertical component of the motion vector signifies that the prediction is formed from pixels in the previous picture which are spatially to the right or below the pixels being predicted. Kuriki, [0005-0006], [0026-0028]: In addition to the above-described series of operations, the encoding apparatus performs an

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	operation of skipping the variable length encoding when the quantization block or the motion vector has the same value as that of the adjacent macroblock or the macroblock at the same position in the previous or subsequent frame, which is referred to as a macroblock skip. Here, a macroblock that is skipped is referred to as a skipped macroblock. More specifically, in the case of a P picture, the encoding device performs the macroblock skip on a macroblock in which the quantization block is 0, that is, all the quantized DCT coefficients in the quantization block are 0 and the motion vector thereof is 0, and In the case of a B picture, the quantization block is 0, and the macroblock skip is performed for a macroblock whose motion vector is the same in magnitude and direction as the motion vector of the left adjacent macroblock of the current macroblock. However, the encoding apparatus sets the start and end of the slice to no macroblock skipping of the located macroblock is performed. … On the other hand, if it is determined in step 23 that the current macroblock is a B picture, the skip determination unit 120 calculates the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock, and determines whether or not the difference is equal to or smaller than the threshold value b (step 26). Here the previous the macro block means a macro block which is an encoding target immediately before the encoding target macro block. In a frame, it is usually a macroblock located on the left side of a macroblock to be encoded. Also, it is assumed that the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is calculated for each of the x component and the y component, and the skip determination unit 120 performs threshold determination for each of the x component and the y component of the difference. That is, the skip determination unit 120 determines whether both the x component and the y component of the difference are equal to or smaller than the threshold value b or whether one or both of the x component and the y component are larger than the threshold value b. It is assumed that the determination in step 26 includes that the direction of prediction (forward prediction, backward prediction, bidirectional prediction, or the

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	like) is the same between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock, that is, the reference frame is the same When it is determined in step 26 that both the x component and the y component of the difference are equal to or smaller than the threshold value b, the skip determination unit 120 determines that the macroblock is a skip macroblock (step 25). The skip determination unit 120 notifies the variable length coding unit 110, the motion vector replacement unit 121, and the addition unit 108 that the macroblock is determined to be a skip macroblock. In this way, in the case of a B picture, the skip determination unit 120 determines that the macroblock is a skip macroblock when the macroblock is not the first or last macroblock of the slice, the quantized block is 0, and the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is equal to or less than the threshold value b in both the x component and the y component. In the present embodiment, the threshold value b is 1.0. That is, when the skip determination unit 120 determines that both the x component and the y component of the motion vector difference between the current macroblock and the immediately preceding macroblock are equal to or smaller than 1.0, it determines that the current macroblock is a skip macroblock. If it is 1.0 or less, as in the case of the P picture, even if the coding of the macro block is omitted, the difference between the original image and the reproduced image is hardly noticeable to the human visual sense, so that there is substantially no problem. Note that the threshold value a and the threshold value b are not limited to 0.5 and 1.0, and, for example, the user may be allowed to set arbitrary values in the skip determination unit 120 within a range in which deterioration in image quality is allowable. Kuriki, [0002], [0004], [0008]: [Prior art] An encoding apparatus for compression-encoding moving image data by the MPEG

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	method compresses moving image data by performing inter-frame prediction by motion compensation (hereinafter, referred to as motion compensated prediction). The frame of the past of a frame, or the future (or the both) to which an object block belongs with motion compensation prediction about the block (it is hereafter called an object block) of the coding subject in a video data (hereinafter, referred to as a reference frame), and obtains a difference (hereinafter, referred to as a prediction error) of each pixel between the target block and the reference block, and a motion vector indicating a relative positional relationship between both blocks. Typically, motion compensated prediction is performed on a macroblock basis. … Here, the encoding type will be described. There are three kinds of encoding types, i.e., I picture, P picture, and B picture, and any one of the three kinds of encoding types is determined for each frame, and each frame is encoded by a different encoding method according to the encoding type. In a frame of an I picture, a luminance signal and two color difference signals of a macro block are subjected to DCT, quantization and variable length coding without performing motion compensation prediction. The I-picture frame serves as a reference frame of a frame of another encoding type. A frame of a P picture is motion-compensated and predicted using a frame of a past I picture or P picture as a reference frame, and a prediction error after the motion-compensated prediction is subjected to DCT, quantization, and variable length coding. The frame of the P picture serves as a reference frame of a macroblock of another P picture or B picture. The encoding method of the P picture is called unidirectional prediction. The frame of the B picture is motion-compensated and predicted using the frame of the past or future (or both) I picture or P picture as a reference frame, and the resulting prediction error is subjected to DCT, quantization, and variable length coding. It does not become a reference frame for other frames. The B-picture encoding method is called bidirectional prediction because it is predicted from both the past and future directions

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	…. When a decoding device for decoding moving image data detects that there is a skip macroblock from an address of a macroblock, the decoding device performs: The P picture is decoded by using a block at the same position as the skip macro block in the reference frame of the picture, and the B picture is decoded by using the motion vector of the left adjacent macro block. Lee, 63-64: Thus inter coding can be performed according to one of the following 15 modes of operation: SKIP: The current MB is replaced by the MB at the same spatial location in the previous reconstructed picture. Encoding is performed by skipping the current MB and incrementing the MB address. This mode is designed for areas in the picture where little or no change relative to the previously reconstructed picture is detected. FR-PMV: One motion vector for the current MB is predicted and used as an estimate. Motion vector searching is not performed. As only motion compensation is required, the MB is encoded using the header and the motion vector bits. When motion vectors can be accurately predicted, this mode becomes a likely candidate. Sugahara, 8:47-56. An apparatus for achieving the third objective set out above can be basically similarly configured, but with the copy data specifying a fixed non-zero size and direction for a motion vector of a predictively encoded picture, and zero amounts of motion compensated prediction error for each of the macroblocks of the picture, and with the apparatus also including means for operating on successive I-pictures such as to produce appropriate amounts of successive displacement of these pictures (with respect to a display screen) when the MPEG data are

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	decoded and displayed. Sugahara, 13:1-8. With a second mode of operation of this embodiment, referring to FIG. 6, in addition to such conversion of each B-picture, each P-picture 32 is also converted by the stream portion changeover section 25 such that all of the macroblocks become skipped macroblocks with forward prediction, i.e., the MPEG data of the P-picture 31 are re-encoded as code which expresses a copy of the preceding reference picture. Sugahara, 17:20-29. For example, if the second mode of processing described above is modified such that each P-picture copy stream portion and B-picture copy stream portion specifies a picture as having a fixed non-zero motion vector in a fixed direction, and all of the P and B-pictures of a GOP are subjected to copy data replacement, then the result will be that the final displayed picture will be successively shifted across the display screen, in the direction of the motion vector, when that GOP is decoded and a resultant video signal generated.
23[b] the predicted non-zero motion vector is assigned for the skip coding mode of the first segment; and	The below references, as evidence by the example citations, disclose the predicted non-zero motion vector is assigned for the skip coding mode of the first segment. *See, e.g.*, Hwang, 3:25-35: A current frame and a previous frame (in other words, a search frame and a reference frame) of

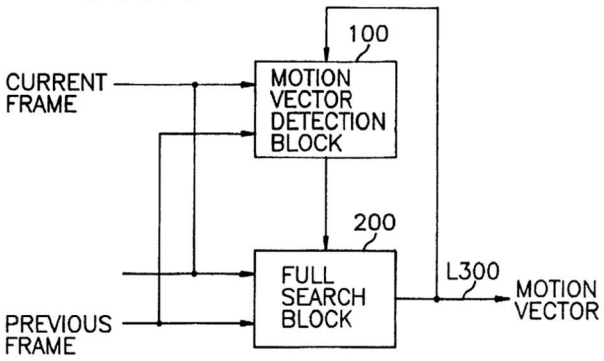
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	a video signal are inputted to a motion vector detection block 100 and a full search block 200. At the motion vector detection block 100, to find a motion vector of a search block, i.e., a block currently being processed, motion vectors of processed neighboring blocks of the search block together with a 0 vector are examined to select a candidate motion vector, wherein processed blocks refers to blocks whose motion vectors are determined and the processed neighboring blocks are processed blocks neighboring the search block. Hwang, 3:36-56: The processed neighboring blocks whose motion vectors are utilized in detecting the motion vector of the search block B(i,j) are exemplified in FIG. 4. As shown in FIG. 4, the search frame consists of a multiplicity of slices, each of which includes a number of blocks, the number of slices and the number of blocks in each slice being N2 and N1, respectively. The search frame are processed from the upper left corner to the lower right corner. Therefore, among 8 neighboring blocks surrounding the search block B(i,j), motion vectors of 4 neighboring blocks, i.e., an upper left block B(i-1, j-1), an upper middle block B(i,j-1), an upper right block B(i+1,j-1), and a middle left block B(i-1,j), are known when the search block is processed, wherein j represents a slice number and i designates a location of a block in a slice, i and j being positive integers not larger than N1 and N2, respectively. It can be easily known that, if a search block is not located on the boundary of a frame, the number of processed neighboring blocks is 4. In case the search block is on the boundary as in the case of B(1,1), B(1,2) and so on, the number of processed neighboring blocks may be less than 4. Hwang, 3:57-4:12: After the candidate motion vector is determined, a distortion between the search block and a predicted block corresponding to the candidate motion vector is compared with a predetermined threshold, wherein a predicted block corresponding to a vector is determined as a block of the reference frame which is displaced from the search block by the vector.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	If the distortion between the search block and the predicted block corresponding to the candidate motion vector is smaller than the threshold, the candidate motion vector is decided as a motion vector of the search block and provided on a line L300 through the full search block 200. Otherwise, a full search trigger signal is applied to the full search block 200 which detects a motion vector of the search block by using a full search block matching method in response to the full search trigger signal. The full search block 200 provides either the motion vector provided from the motion vector detection block 100 or the motion vector determined therein. The motion vector provided from the full search block 200 is fed back to the motion vector detection block 100, to be used in detecting motion vectors of subsequent blocks, e.g., B(i+1,j), of the current frame. Hwang, 4:33-50: Referring to FIG. 2, there is provided a detailed block diagram of the motion vector detection block 100 shown in FIG. 1. The motion vectors of the processed blocks are fed to a motion vector memory 110, to be stored therein. Among them, neighboring vectors which refer to motion vectors of the processed neighboring blocks are selected and coupled to a candidate vector deciding block 120. Referring again to FIG. 4, when the search block B(i,j) is being processed, at least motion vectors of the blocks B(i-1, j-1) to B(N1, j-1) and B(1,j) to B(i-1,j) should be stored at the motion vector memory 110. (Note that B(i, j-1) to B(N1, j-1) are necessary in determining motion vector of remaining blocks, i.e., B(i+1, j) to B(N1, j) included in a jth slice; and B(1, j) to B(i-1, j) are used in determining motion vectors of blocks included in a (j+1)st slice.) Therefore, the motion vector memory 110 should at least have (N1+1) memory spaces each of which can accommodate a motion vector of a processed block. Hwang, 5:11-27: Referring to FIG. 4, in case the number of processed neighboring blocks is 1, (for example, a

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	search block B(2,1)) the motion vector of the processed neighboring block (B(1,1)) may be decided as both of the X and the Y vectors. At the error detection block 130, a distortion between the search block and each of three predicted blocks corresponding to the three candidate vectors inputted thereto is determined, wherein the distortion is a value which represents a difference between two blocks. Of the three candidate vectors, one with a minimum distortion is selected as the candidate motion vector. If the minimum distortion of the candidate motion vector is smaller than the threshold TH, the candidate motion vector is determined as the final motion vector of the search block. Accordingly, a procedure for detecting a motion vector of the search block is completed and the motion vector is provided on L300 through the full search block 200. Hwang, Figs. 1-4: *FIG. 1* 

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:

FIG. 2

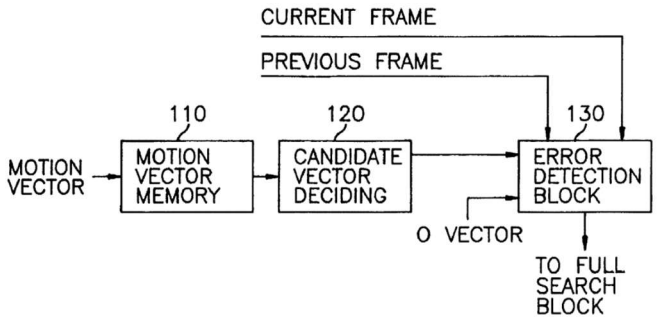
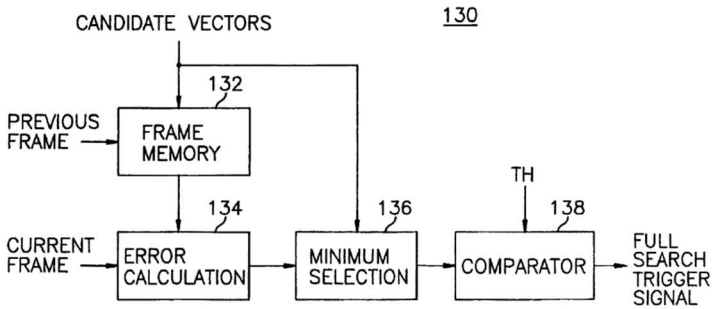
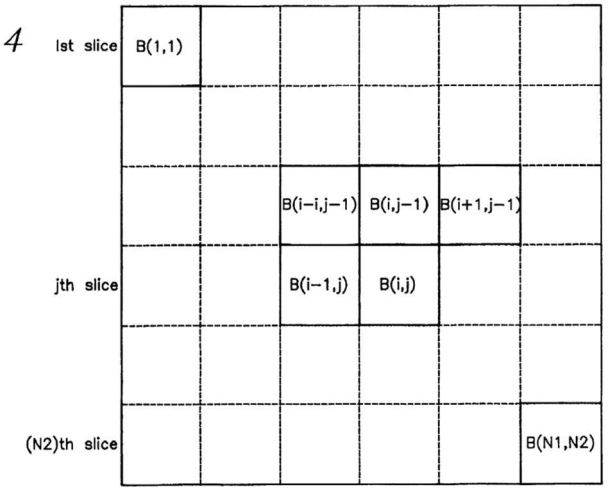


FIG. 3



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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	FIG. 4  H.263, § 6.1.1:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	6.1.1 Differential motion vectors The macroblock vector is obtained by adding predictors to the vector differences indicated by MVD (see Table 11). For differential coding with four vectors per macroblock, refer to Annex F. In case of one vector per macroblock, the candidate predictors for the differential coding are taken from three surrounding macroblocks as indicated in Figure 11. The predictors are calculated separately for the horizontal and vertical components. In the special cases at the borders of the current GOB or picture, the following decision rules are applied in increasing order: 1) When the corresponding macroblock was coded in INTRA mode (if not in PB-frames mode) or was not coded (COD = 1), the candidate predictor is set to zero. 2) The candidate predictor MV1 is set to zero if the corresponding macroblock is outside the picture (at the left side). 3) Then, the candidate predictors MV2 and MV3 are set to MV1 if the corresponding macroblocks are outside the picture (at the top) or outside the GOB (at the top) if the GOB header of the current GOB is non-empty. 4) Then, the candidate predictor MV3 is set to zero if the corresponding macroblock is outside the picture (at the right side). For each component, the predictor is the median value of the three candidate predictors for this component. Advantage is taken of the fact that the range of motion vector component values is constrained. Each VLC word for MVD represents a pair of difference values. Only one of the pair will yield a macroblock vector component falling within the permitted range [–16, 15.5]. A positive value of the horizontal or vertical component of the motion vector signifies that the prediction is formed from pixels in the previous picture which are spatially to the right or below the pixels being predicted. Kuriki, [0005-0006], [0026-0028]: In addition to the above-described series of operations, the encoding apparatus performs an operation of skipping the variable length encoding when the quantization block or the motion vector has the same value as that of the adjacent macroblock or the macroblock at the same

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	position in the previous or subsequent frame, which is referred to as a macroblock skip. Here, a macroblock that is skipped is referred to as a skipped macroblock. More specifically, in the case of a P picture, the encoding device performs the macroblock skip on a macroblock in which the quantization block is 0, that is, all the quantized DCT coefficients in the quantization block are 0 and the motion vector thereof is 0, and In the case of a B picture, the quantization block is 0, and the macroblock skip is performed for a macroblock whose motion vector is the same in magnitude and direction as the motion vector of the left adjacent macroblock of the current macroblock. However, the encoding apparatus sets the start and end of the slice to no macroblock skipping of the located macroblock is performed. … On the other hand, if it is determined in step 23 that the current macroblock is a B picture, the skip determination unit 120 calculates the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock, and determines whether or not the difference is equal to or smaller than the threshold value b (step 26). Here the previous the macro block means a macro block which is an encoding target immediately before the encoding target macro block. In a frame, it is usually a macroblock located on the left side of a macroblock to be encoded. Also, it is assumed that the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is calculated for each of the x component and the y component, and the skip determination unit 120 performs threshold determination for each of the x component and the y component of the difference. That is, the skip determination unit 120 determines whether both the x component and the y component of the difference are equal to or smaller than the threshold value b or whether one or both of the x component and the y component are larger than the threshold value b. It is assumed that the determination in step 26 includes that the direction of prediction (forward prediction, backward prediction, bidirectional prediction, or the like) is the same between the motion vector of the current macroblock and the motion vector of

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	the immediately preceding macroblock, that is, the reference frame is the same When it is determined in step 26 that both the x component and the y component of the difference are equal to or smaller than the threshold value b, the skip determination unit 120 determines that the macroblock is a skip macroblock (step 25). The skip determination unit 120 notifies the variable length coding unit 110, the motion vector replacement unit 121, and the addition unit 108 that the macroblock is determined to be a skip macroblock. In this way, in the case of a B picture, the skip determination unit 120 determines that the macroblock is a skip macroblock when the macroblock is not the first or last macroblock of the slice, the quantized block is 0, and the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is equal to or less than the threshold value b in both the x component and the y component. In the present embodiment, the threshold value b is 1.0. That is, when the skip determination unit 120 determines that both the x component and the y component of the motion vector difference between the current macroblock and the immediately preceding macroblock are equal to or smaller than 1.0, it determines that the current macroblock is a skip macroblock. If it is 1.0 or less, as in the case of the P picture, even if the coding of the macro block is omitted, the difference between the original image and the reproduced image is hardly noticeable to the human visual sense, so that there is substantially no problem. Note that the threshold value a and the threshold value b are not limited to 0.5 and 1.0, and, for example, the user may be allowed to set arbitrary values in the skip determination unit 120 within a range in which deterioration in image quality is allowable. Kuriki, [0002], [0004], [0008]: [Prior art] An encoding apparatus for compression-encoding moving image data by the MPEG method compresses moving image data by performing inter-frame prediction by motion compensation (hereinafter, referred to as motion compensated prediction). The frame of the

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	past of a frame, or the future (or the both) to which an object block belongs with motion compensation prediction about the block (it is hereafter called an object block) of the coding subject in a video data (hereinafter, referred to as a reference frame), and obtains a difference (hereinafter, referred to as a prediction error) of each pixel between the target block and the reference block, and a motion vector indicating a relative positional relationship between both blocks. Typically, motion compensated prediction is performed on a macroblock basis. … Here, the encoding type will be described. There are three kinds of encoding types, i.e., I picture, P picture, and B picture, and any one of the three kinds of encoding types is determined for each frame, and each frame is encoded by a different encoding method according to the encoding type. In a frame of an I picture, a luminance signal and two color difference signals of a macro block are subjected to DCT, quantization and variable length coding without performing motion compensation prediction. The I-picture frame serves as a reference frame of a frame of another encoding type. A frame of a P picture is motion-compensated and predicted using a frame of a past I picture or P picture as a reference frame, and a prediction error after the motion-compensated prediction is subjected to DCT, quantization, and variable length coding. The frame of the P picture serves as a reference frame of a macroblock of another P picture or B picture. The encoding method of the P picture is called unidirectional prediction. The frame of the B picture is motion-compensated and predicted using the frame of the past or future (or both) I picture or P picture as a reference frame, and the resulting prediction error is subjected to DCT, quantization, and variable length coding. It does not become a reference frame for other frames. The B-picture encoding method is called bidirectional prediction because it is predicted from both the past and future directions …. When a decoding device for decoding moving image data detects that there is a skip

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	macroblock from an address of a macroblock, the decoding device performs: The P picture is decoded by using a block at the same position as the skip macro block in the reference frame of the picture, and the B picture is decoded by using the motion vector of the left adjacent macro block. Lee, 63-64: Thus inter coding can be performed according to one of the following 15 modes of operation: SKIP: The current MB is replaced by the MB at the same spatial location in the previous reconstructed picture. Encoding is performed by skipping the current MB and incrementing the MB address. This mode is designed for areas in the picture where little or no change relative to the previously reconstructed picture is detected. FR-PMV: One motion vector for the current MB is predicted and used as an estimate. Motion vector searching is not performed. As only motion compensation is required, the MB is encoded using the header and the motion vector bits. When motion vectors can be accurately predicted, this mode becomes a likely candidate. Sugahara, 8:47-56. An apparatus for achieving the third objective set out above can be basically similarly configured, but with the copy data specifying a fixed non-zero size and direction for a motion vector of a predictively encoded picture, and zero amounts of motion compensated prediction error for each of the macroblocks of the picture, and with the apparatus also including means for operating on successive I-pictures such as to produce appropriate amounts of successive displacement of these pictures (with respect to a display screen) when the MPEG data are decoded and displayed. Sugahara, 13:1-8. With a second mode of operation of this embodiment, referring to FIG. 6, in addition to such

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	conversion of each B-picture, each P-picture 32 is also converted by the stream portion changeover section 25 such that all of the macroblocks become skipped macroblocks with forward prediction, i.e., the MPEG data of the P-picture 31 are re-encoded as code which expresses a copy of the preceding reference picture. Sugahara, 17:20-29. For example, if the second mode of processing described above is modified such that each P-picture copy stream portion and B-picture copy stream portion specifies a picture as having a fixed non-zero motion vector in a fixed direction, and all of the P and B-pictures of a GOP are subjected to copy data replacement, then the result will be that the final displayed picture will be successively shifted across the display screen, in the direction of the motion vector, when that GOP is decoded and a resultant video signal generated.
23[c] the prediction for the first segment is formed by a motion compensated prediction with respect to the reference frame based at least in part on the predicted non-zero motion vector.	The below references, as evidence by the example citations, disclose the prediction for the first segment is formed by a motion compensated prediction with respect to the reference frame based at least in part on the predicted non-zero motion vector. *See, e.g.*, Hwang, 3:25-35: A current frame and a previous frame (in other words, a search frame and a reference frame) of a video signal are inputted to a motion vector detection block 100 and a full search block 200. At the motion vector detection block 100, to find a motion vector of a search block, i.e., a block currently being processed, motion vectors of processed neighboring blocks of the search block together with a 0 vector are examined to select a candidate motion vector, wherein processed

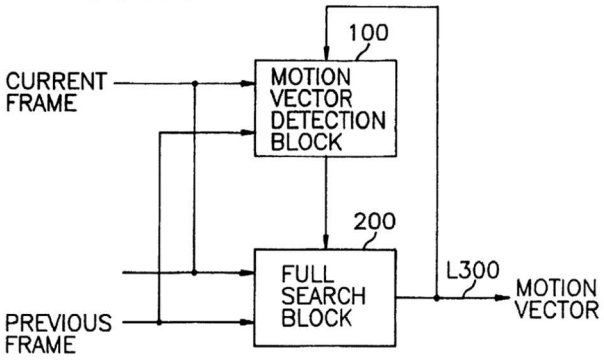
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	blocks refers to blocks whose motion vectors are determined and the processed neighboring blocks are processed blocks neighboring the search block. Hwang, 3:36-56: The processed neighboring blocks whose motion vectors are utilized in detecting the motion vector of the search block B(i,j) are exemplified in FIG. 4. As shown in FIG. 4, the search frame consists of a multiplicity of slices, each of which includes a number of blocks, the number of slices and the number of blocks in each slice being N2 and N1, respectively. The search frame are processed from the upper left corner to the lower right corner. Therefore, among 8 neighboring blocks surrounding the search block B(i,j), motion vectors of 4 neighboring blocks, i.e., an upper left block B(i-1, j-1), an upper middle block B(i,j-1), an upper right block B(i+1,j-1), and a middle left block B(i-1,j), are known when the search block is processed, wherein j represents a slice number and i designates a location of a block in a slice, i and j being positive integers not larger than N1 and N2, respectively. It can be easily known that, if a search block is not located on the boundary of a frame, the number of processed neighboring blocks is 4. In case the search block is on the boundary as in the case of B(1,1), B(1,2) and so on, the number of processed neighboring blocks may be less than 4. Hwang, 3:57-4:12: After the candidate motion vector is determined, a distortion between the search block and a predicted block corresponding to the candidate motion vector is compared with a predetermined threshold, wherein a predicted block corresponding to a vector is determined as a block of the reference frame which is displaced from the search block by the vector. If the distortion between the search block and the predicted block corresponding to the candidate motion vector is smaller than the threshold, the candidate motion vector is decided as a motion vector of the search block and provided on a line L300 through the full search block 200. Otherwise, a full search trigger signal is applied to the full search block 200 which detects

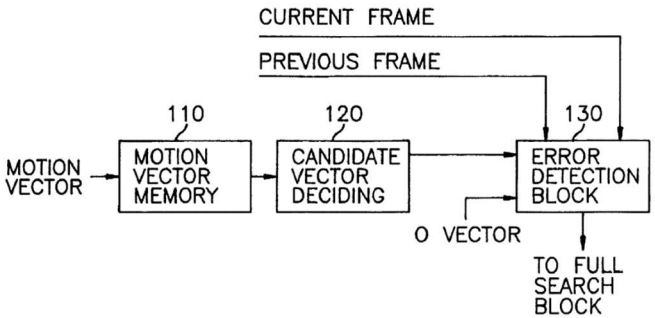
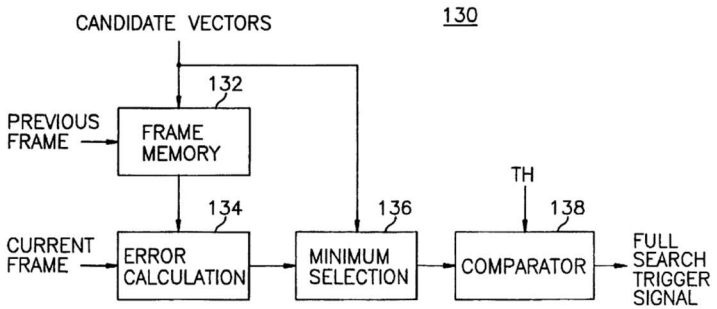
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	a motion vector of the search block by using a full search block matching method in response to the full search trigger signal. The full search block 200 provides either the motion vector provided from the motion vector detection block 100 or the motion vector determined therein. The motion vector provided from the full search block 200 is fed back to the motion vector detection block 100, to be used in detecting motion vectors of subsequent blocks, e.g., B(i+1,j), of the current frame. Hwang, 4:33-50: Referring to FIG. 2, there is provided a detailed block diagram of the motion vector detection block 100 shown in FIG. 1. The motion vectors of the processed blocks are fed to a motion vector memory 110, to be stored therein. Among them, neighboring vectors which refer to motion vectors of the processed neighboring blocks are selected and coupled to a candidate vector deciding block 120. Referring again to FIG. 4, when the search block B(i,j) is being processed, at least motion vectors of the blocks B(i-1, j-1) to B(N1, j-1) and B(1,j) to B(i-1,j) should be stored at the motion vector memory 110. (Note that B(i, j-1) to B(N1, j-1) are necessary in determining motion vector of remaining blocks, i.e., B(i+1, j) to B(N1, j) included in a jth slice; and B(1, j) to B(i-1, j) are used in determining motion vectors of blocks included in a (j+1)st slice.) Therefore, the motion vector memory 110 should at least have (N1+1) memory spaces each of which can accommodate a motion vector of a processed block. Hwang, 5:11-27: Referring to FIG. 4, in case the number of processed neighboring blocks is 1, (for example, a search block B(2,1)) the motion vector of the processed neighboring block (B(1,1)) may be decided as both of the X and the Y vectors. At the error detection block 130, a distortion between the search block and each of three

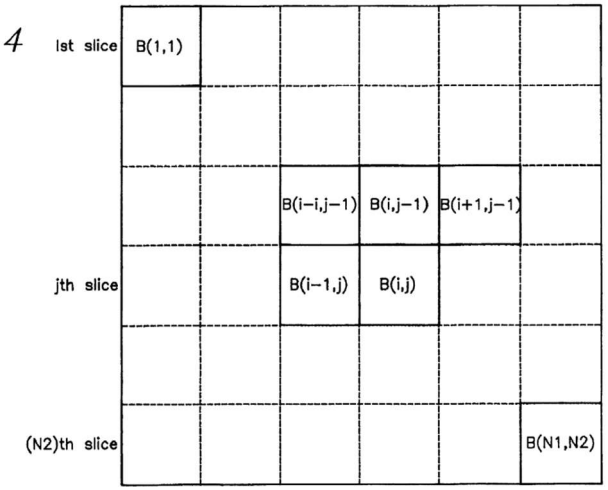
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	predicted blocks corresponding to the three candidate vectors inputted thereto is determined, wherein the distortion is a value which represents a difference between two blocks. Of the three candidate vectors, one with a minimum distortion is selected as the candidate motion vector. If the minimum distortion of the candidate motion vector is smaller than the threshold TH, the candidate motion vector is determined as the final motion vector of the search block. Accordingly, a procedure for detecting a motion vector of the search block is completed and the motion vector is provided on L300 through the full search block 200. Hwang, Figs. 1-4: *FIG. 1* 

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	FIG. 2  *FIG. 3* 

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	FIG. 4  H.263, § 6.1.1:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:

6.1.1 Differential motion vectors

The macroblock vector is obtained by adding predictors to the vector differences indicated by MVD (see Table 11). For differential coding with four vectors per macroblock, refer to Annex F. In case of one vector per macroblock, the candidate predictors for the differential coding are taken from three surrounding macroblocks as indicated in Figure 11. The predictors are calculated separately for the horizontal and vertical components.

In the special cases at the borders of the current GOB or picture, the following decision rules are applied in increasing order:

1) When the corresponding macroblock was coded in INTRA mode (if not in PB-frames mode) or was not coded (COD = 1), the candidate predictor is set to zero.
2) The candidate predictor MV1 is set to zero if the corresponding macroblock is outside the picture (at the left side).
3) Then, the candidate predictors MV2 and MV3 are set to MV1 if the corresponding macroblocks are outside the picture (at the top) or outside the GOB (at the top) if the GOB header of the current GOB is non-empty.
4) Then, the candidate predictor MV3 is set to zero if the corresponding macroblock is outside the picture (at the right side).

For each component, the predictor is the median value of the three candidate predictors for this component.

Advantage is taken of the fact that the range of motion vector component values is constrained. Each VLC word for MVD represents a pair of difference values. Only one of the pair will yield a macroblock vector component falling within the permitted range [–16, 15.5]. A positive value of the horizontal or vertical component of the motion vector signifies that the prediction is formed from pixels in the previous picture which are spatially to the right or below the pixels being predicted.

Kuriki, [0005-0006], [0026-0028]:

> In addition to the above-described series of operations, the encoding apparatus performs an operation of skipping the variable length encoding when the quantization block or the motion vector has the same value as that of the adjacent macroblock or the macroblock at the same

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	position in the previous or subsequent frame, which is referred to as a macroblock skip. Here, a macroblock that is skipped is referred to as a skipped macroblock. More specifically, in the case of a P picture, the encoding device performs the macroblock skip on a macroblock in which the quantization block is 0, that is, all the quantized DCT coefficients in the quantization block are 0 and the motion vector thereof is 0, and In the case of a B picture, the quantization block is 0, and the macroblock skip is performed for a macroblock whose motion vector is the same in magnitude and direction as the motion vector of the left adjacent macroblock of the current macroblock. However, the encoding apparatus sets the start and end of the slice to no macroblock skipping of the located macroblock is performed. … On the other hand, if it is determined in step 23 that the current macroblock is a B picture, the skip determination unit 120 calculates the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock, and determines whether or not the difference is equal to or smaller than the threshold value b (step 26). Here the previous the macro block means a macro block which is an encoding target immediately before the encoding target macro block. In a frame, it is usually a macroblock located on the left side of a macroblock to be encoded. Also, it is assumed that the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is calculated for each of the x component and the y component, and the skip determination unit 120 performs threshold determination for each of the x component and the y component of the difference. That is, the skip determination unit 120 determines whether both the x component and the y component of the difference are equal to or smaller than the threshold value b or whether one or both of the x component and the y component are larger than the threshold value b. It is assumed that the determination in step 26 includes that the direction of prediction (forward prediction, backward prediction, bidirectional prediction, or the like) is the same between the motion vector of the current macroblock and the motion vector of

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	the immediately preceding macroblock, that is, the reference frame is the same When it is determined in step 26 that both the x component and the y component of the difference are equal to or smaller than the threshold value b, the skip determination unit 120 determines that the macroblock is a skip macroblock (step 25). The skip determination unit 120 notifies the variable length coding unit 110, the motion vector replacement unit 121, and the addition unit 108 that the macroblock is determined to be a skip macroblock. In this way, in the case of a B picture, the skip determination unit 120 determines that the macroblock is a skip macroblock when the macroblock is not the first or last macroblock of the slice, the quantized block is 0, and the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is equal to or less than the threshold value b in both the x component and the y component. In the present embodiment, the threshold value b is 1.0. That is, when the skip determination unit 120 determines that both the x component and the y component of the motion vector difference between the current macroblock and the immediately preceding macroblock are equal to or smaller than 1.0, it determines that the current macroblock is a skip macroblock. If it is 1.0 or less, as in the case of the P picture, even if the coding of the macro block is omitted, the difference between the original image and the reproduced image is hardly noticeable to the human visual sense, so that there is substantially no problem. Note that the threshold value a and the threshold value b are not limited to 0.5 and 1.0, and, for example, the user may be allowed to set arbitrary values in the skip determination unit 120 within a range in which deterioration in image quality is allowable. Kuriki, [0002], [0004], [0008]: [Prior art] An encoding apparatus for compression-encoding moving image data by the MPEG method compresses moving image data by performing inter-frame prediction by motion compensation (hereinafter, referred to as motion compensated prediction). The frame of the

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	past of a frame, or the future (or the both) to which an object block belongs with motion compensation prediction about the block (it is hereafter called an object block) of the coding subject in a video data (hereinafter, referred to as a reference frame), and obtains a difference (hereinafter, referred to as a prediction error) of each pixel between the target block and the reference block, and a motion vector indicating a relative positional relationship between both blocks. Typically, motion compensated prediction is performed on a macroblock basis. … Here, the encoding type will be described. There are three kinds of encoding types, i.e., I picture, P picture, and B picture, and any one of the three kinds of encoding types is determined for each frame, and each frame is encoded by a different encoding method according to the encoding type. In a frame of an I picture, a luminance signal and two color difference signals of a macro block are subjected to DCT, quantization and variable length coding without performing motion compensation prediction. The I-picture frame serves as a reference frame of a frame of another encoding type. A frame of a P picture is motion-compensated and predicted using a frame of a past I picture or P picture as a reference frame, and a prediction error after the motion-compensated prediction is subjected to DCT, quantization, and variable length coding. The frame of the P picture serves as a reference frame of a macroblock of another P picture or B picture. The encoding method of the P picture is called unidirectional prediction. The frame of the B picture is motion-compensated and predicted using the frame of the past or future (or both) I picture or P picture as a reference frame, and the resulting prediction error is subjected to DCT, quantization, and variable length coding. It does not become a reference frame for other frames. The B-picture encoding method is called bidirectional prediction because it is predicted from both the past and future directions …. When a decoding device for decoding moving image data detects that there is a skip

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	macroblock from an address of a macroblock, the decoding device performs: The P picture is decoded by using a block at the same position as the skip macro block in the reference frame of the picture, and the B picture is decoded by using the motion vector of the left adjacent macro block. Lee, 63-64: Thus inter coding can be performed according to one of the following 15 modes of operation: SKIP: The current MB is replaced by the MB at the same spatial location in the previous reconstructed picture. Encoding is performed by skipping the current MB and incrementing the MB address. This mode is designed for areas in the picture where little or no change relative to the previously reconstructed picture is detected. FR-PMV: One motion vector for the current MB is predicted and used as an estimate. Motion vector searching is not performed. As only motion compensation is required, the MB is encoded using the header and the motion vector bits. When motion vectors can be accurately predicted, this mode becomes a likely candidate. Sugahara, 7:2-15. The method can be implemented such that each of the pictures for which prediction information is replaced is a B-picture, and the copy data set includes motion vector information indicating that an overall amount of picture motion of a B-picture with respect to a corresponding temporally preceding or succeeding reference picture is zero, and motion compensated prediction error information indicating that respective amounts of motion compensated prediction error for all macroblocks of the B-picture are zero. That is to say, all macroblocks of the B-picture are indicated as being skipped macroblocks, so that at the time of decoding the MPEG data stream, that B-picture will be decoded as an identical copy of a corresponding reference picture.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	Sugahara, 8:47-56. An apparatus for achieving the third objective set out above can be basically similarly configured, but with the copy data specifying a fixed non-zero size and direction for a motion vector of a predictively encoded picture, and zero amounts of motion compensated prediction error for each of the macroblocks of the picture, and with the apparatus also including means for operating on successive I-pictures such as to produce appropriate amounts of successive displacement of these pictures (with respect to a display screen) when the MPEG data are decoded and displayed. Sugahara, 13:1-8. With a second mode of operation of this embodiment, referring to FIG. 6, in addition to such conversion of each B-picture, each P-picture 32 is also converted by the stream portion changeover section 25 such that all of the macroblocks become skipped macroblocks with forward prediction, i.e., the MPEG data of the P-picture 31 are re-encoded as code which expresses a copy of the preceding reference picture. Sugahara, 17:20-29. For example, if the second mode of processing described above is modified such that each P-picture copy stream portion and B-picture copy stream portion specifies a picture as having a fixed non-zero motion vector in a fixed direction, and all of the P and B-pictures of a GOP are subjected to copy data replacement, then the result will be that the final displayed picture will be successively shifted across the display screen, in the direction of the motion vector, when that GOP is decoded and a resultant video signal generated.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	Sugahara, 21:50-67. wherein said stream is an MPEG compressed video data stream in which each of said reference pictures is an I-picture or a P-picture and each of said predictively encoded pictures is a P-picture or a B-picture, each of said pictures for which prediction information is replaced is a B-picture, and wherein said copy data set includes motion vector information indicating that an overall amount of picture motion of a B-picture with respect to a corresponding temporally preceding reference picture or with respect to a corresponding temporally succeeding reference picture is zero and motion compensated prediction error information indicating that respective amounts of motion compensated prediction error for all macroblocks of said B-picture are zero, to thereby specify all macroblocks of said B-picture as being skipped macroblocks.
24. A method according to claim 1, wherein if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from the reference picture, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is	The below references, as evidence by the example citations, disclose that if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from the reference picture, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector. *See, e.g.*, Hwang, 3:25-35: A current frame and a previous frame (in other words, a search frame and a reference frame) of a video signal are inputted to a motion vector detection block 100 and a full search block 200. At the motion vector detection block 100, to find a motion vector of a search block, i.e., a block currently being processed, motion vectors of processed neighboring blocks of the search block together with a 0 vector are examined to select a candidate motion vector, wherein processed

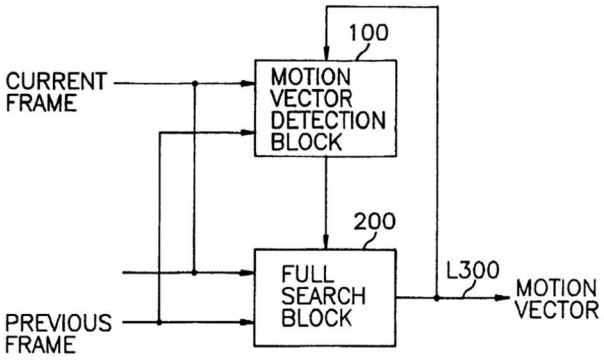
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
formed with respect to a corresponding segment of the reference frame associated with the zero motion vector.	blocks refers to blocks whose motion vectors are determined and the processed neighboring blocks are processed blocks neighboring the search block. Hwang, 3:36-56: The processed neighboring blocks whose motion vectors are utilized in detecting the motion vector of the search block B(i,j) are exemplified in FIG. 4. As shown in FIG. 4, the search frame consists of a multiplicity of slices, each of which includes a number of blocks, the number of slices and the number of blocks in each slice being N2 and N1, respectively. The search frame are processed from the upper left corner to the lower right corner. Therefore, among 8 neighboring blocks surrounding the search block B(i,j), motion vectors of 4 neighboring blocks, i.e., an upper left block B(i-1, j-1), an upper middle block B(i,j-1), an upper right block B(i+1,j-1), and a middle left block B(i-1,j), are known when the search block is processed, wherein j represents a slice number and i designates a location of a block in a slice, i and j being positive integers not larger than N1 and N2, respectively. It can be easily known that, if a search block is not located on the boundary of a frame, the number of processed neighboring blocks is 4. In case the search block is on the boundary as in the case of B(1,1), B(1,2) and so on, the number of processed neighboring blocks may be less than 4. Hwang, 3:57-4:12: After the candidate motion vector is determined, a distortion between the search block and a predicted block corresponding to the candidate motion vector is compared with a predetermined threshold, wherein a predicted block corresponding to a vector is determined as a block of the reference frame which is displaced from the search block by the vector. If the distortion between the search block and the predicted block corresponding to the candidate motion vector is smaller than the threshold, the candidate motion vector is decided as a motion vector of the search block and provided on a line L300 through the full search block 200. Otherwise, a full search trigger signal is applied to the full search block 200 which detects

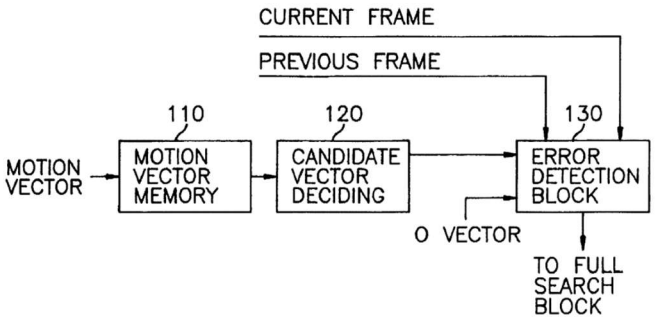
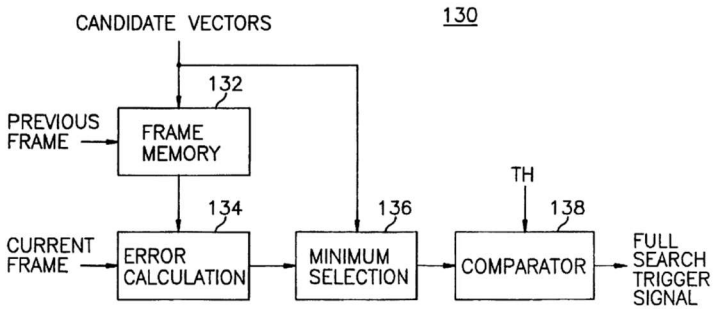
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	a motion vector of the search block by using a full search block matching method in response to the full search trigger signal. The full search block 200 provides either the motion vector provided from the motion vector detection block 100 or the motion vector determined therein. The motion vector provided from the full search block 200 is fed back to the motion vector detection block 100, to be used in detecting motion vectors of subsequent blocks, e.g., B(i+1,j), of the current frame. Hwang, 4:33-50: Referring to FIG. 2, there is provided a detailed block diagram of the motion vector detection block 100 shown in FIG. 1. The motion vectors of the processed blocks are fed to a motion vector memory 110, to be stored therein. Among them, neighboring vectors which refer to motion vectors of the processed neighboring blocks are selected and coupled to a candidate vector deciding block 120. Referring again to FIG. 4, when the search block B(i,j) is being processed, at least motion vectors of the blocks B(i-1, j-1) to B(N1, j-1) and B(1,j) to B(i-1,j) should be stored at the motion vector memory 110. (Note that B(i, j-1) to B(N1, j-1) are necessary in determining motion vector of remaining blocks, i.e., B(i+1, j) to B(N1, j) included in a jth slice; and B(1, j) to B(i-1, j) are used in determining motion vectors of blocks included in a (j+1)st slice.) Therefore, the motion vector memory 110 should at least have (N1+1) memory spaces each of which can accommodate a motion vector of a processed block. Hwang, 5:11-27: Referring to FIG. 4, in case the number of processed neighboring blocks is 1, (for example, a search block B(2,1)) the motion vector of the processed neighboring block (B(1,1)) may be decided as both of the X and the Y vectors. At the error detection block 130, a distortion between the search block and each of three

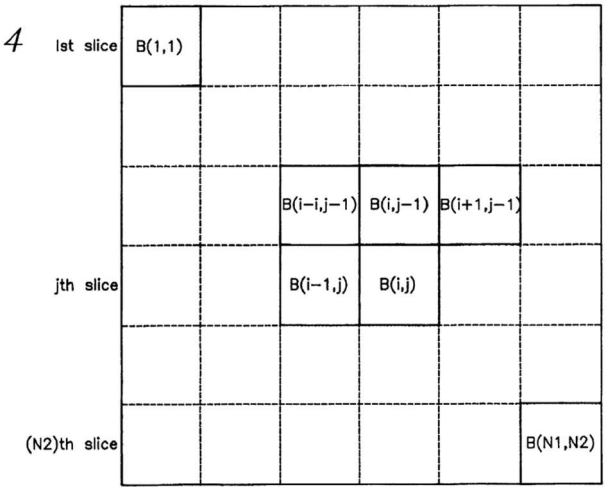
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	predicted blocks corresponding to the three candidate vectors inputted thereto is determined, wherein the distortion is a value which represents a difference between two blocks. Of the three candidate vectors, one with a minimum distortion is selected as the candidate motion vector. If the minimum distortion of the candidate motion vector is smaller than the threshold TH, the candidate motion vector is determined as the final motion vector of the search block. Accordingly, a procedure for detecting a motion vector of the search block is completed and the motion vector is provided on L300 through the full search block 200. Hwang, Figs. 1-4: *FIG. 1* 

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	FIG. 2  *FIG. 3* 

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	FIG. 4  H.263, § 6.1.1:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	6.1.1 Differential motion vectors The macroblock vector is obtained by adding predictors to the vector differences indicated by MVD (see Table 11). For differential coding with four vectors per macroblock, refer to Annex F. In case of one vector per macroblock, the candidate predictors for the differential coding are taken from three surrounding macroblocks as indicated in Figure 11. The predictors are calculated separately for the horizontal and vertical components. In the special cases at the borders of the current GOB or picture, the following decision rules are applied in increasing order: 1) When the corresponding macroblock was coded in INTRA mode (if not in PB-frames mode) or was not coded (COD = 1), the candidate predictor is set to zero. 2) The candidate predictor MV1 is set to zero if the corresponding macroblock is outside the picture (at the left side). 3) Then, the candidate predictors MV2 and MV3 are set to MV1 if the corresponding macroblocks are outside the picture (at the top) or outside the GOB (at the top) if the GOB header of the current GOB is non-empty. 4) Then, the candidate predictor MV3 is set to zero if the corresponding macroblock is outside the picture (at the right side). For each component, the predictor is the median value of the three candidate predictors for this component. Advantage is taken of the fact that the range of motion vector component values is constrained. Each VLC word for MVD represents a pair of difference values. Only one of the pair will yield a macroblock vector component falling within the permitted range [–16, 15.5]. A positive value of the horizontal or vertical component of the motion vector signifies that the prediction is formed from pixels in the previous picture which are spatially to the right or below the pixels being predicted. Kuriki, [0005-0006], [0026-0028]: In addition to the above-described series of operations, the encoding apparatus performs an operation of skipping the variable length encoding when the quantization block or the motion vector has the same value as that of the adjacent macroblock or the macroblock at the same

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	position in the previous or subsequent frame, which is referred to as a macroblock skip. Here, a macroblock that is skipped is referred to as a skipped macroblock. More specifically, in the case of a P picture, the encoding device performs the macroblock skip on a macroblock in which the quantization block is 0, that is, all the quantized DCT coefficients in the quantization block are 0 and the motion vector thereof is 0, and In the case of a B picture, the quantization block is 0, and the macroblock skip is performed for a macroblock whose motion vector is the same in magnitude and direction as the motion vector of the left adjacent macroblock of the current macroblock. However, the encoding apparatus sets the start and end of the slice to no macroblock skipping of the located macroblock is performed. … On the other hand, if it is determined in step 23 that the current macroblock is a B picture, the skip determination unit 120 calculates the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock, and determines whether or not the difference is equal to or smaller than the threshold value b (step 26). Here the previous the macro block means a macro block which is an encoding target immediately before the encoding target macro block. In a frame, it is usually a macroblock located on the left side of a macroblock to be encoded. Also, it is assumed that the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is calculated for each of the x component and the y component, and the skip determination unit 120 performs threshold determination for each of the x component and the y component of the difference. That is, the skip determination unit 120 determines whether both the x component and the y component of the difference are equal to or smaller than the threshold value b or whether one or both of the x component and the y component are larger than the threshold value b. It is assumed that the determination in step 26 includes that the direction of prediction (forward prediction, backward prediction, bidirectional prediction, or the like) is the same between the motion vector of the current macroblock and the motion vector of

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	the immediately preceding macroblock, that is, the reference frame is the same When it is determined in step 26 that both the x component and the y component of the difference are equal to or smaller than the threshold value b, the skip determination unit 120 determines that the macroblock is a skip macroblock (step 25). The skip determination unit 120 notifies the variable length coding unit 110, the motion vector replacement unit 121, and the addition unit 108 that the macroblock is determined to be a skip macroblock. In this way, in the case of a B picture, the skip determination unit 120 determines that the macroblock is a skip macroblock when the macroblock is not the first or last macroblock of the slice, the quantized block is 0, and the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is equal to or less than the threshold value b in both the x component and the y component. In the present embodiment, the threshold value b is 1.0. That is, when the skip determination unit 120 determines that both the x component and the y component of the motion vector difference between the current macroblock and the immediately preceding macroblock are equal to or smaller than 1.0, it determines that the current macroblock is a skip macroblock. If it is 1.0 or less, as in the case of the P picture, even if the coding of the macro block is omitted, the difference between the original image and the reproduced image is hardly noticeable to the human visual sense, so that there is substantially no problem. Note that the threshold value a and the threshold value b are not limited to 0.5 and 1.0, and, for example, the user may be allowed to set arbitrary values in the skip determination unit 120 within a range in which deterioration in image quality is allowable. Kuriki, [0002], [0004], [0008]: [Prior art] An encoding apparatus for compression-encoding moving image data by the MPEG method compresses moving image data by performing inter-frame prediction by motion compensation (hereinafter, referred to as motion compensated prediction). The frame of the

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	past of a frame, or the future (or the both) to which an object block belongs with motion compensation prediction about the block (it is hereafter called an object block) of the coding subject in a video data (hereinafter, referred to as a reference frame), and obtains a difference (hereinafter, referred to as a prediction error) of each pixel between the target block and the reference block, and a motion vector indicating a relative positional relationship between both blocks. Typically, motion compensated prediction is performed on a macroblock basis. … Here, the encoding type will be described. There are three kinds of encoding types, i.e., I picture, P picture, and B picture, and any one of the three kinds of encoding types is determined for each frame, and each frame is encoded by a different encoding method according to the encoding type. In a frame of an I picture, a luminance signal and two color difference signals of a macro block are subjected to DCT, quantization and variable length coding without performing motion compensation prediction. The I-picture frame serves as a reference frame of a frame of another encoding type. A frame of a P picture is motion-compensated and predicted using a frame of a past I picture or P picture as a reference frame, and a prediction error after the motion-compensated prediction is subjected to DCT, quantization, and variable length coding. The frame of the P picture serves as a reference frame of a macroblock of another P picture or B picture. The encoding method of the P picture is called unidirectional prediction. The frame of the B picture is motion-compensated and predicted using the frame of the past or future (or both) I picture or P picture as a reference frame, and the resulting prediction error is subjected to DCT, quantization, and variable length coding. It does not become a reference frame for other frames. The B-picture encoding method is called bidirectional prediction because it is predicted from both the past and future directions …. When a decoding device for decoding moving image data detects that there is a skip

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	macroblock from an address of a macroblock, the decoding device performs: The P picture is decoded by using a block at the same position as the skip macro block in the reference frame of the picture, and the B picture is decoded by using the motion vector of the left adjacent macro block. Lee, 63-64: Thus inter coding can be performed according to one of the following 15 modes of operation: SKIP: The current MB is replaced by the MB at the same spatial location in the previous reconstructed picture. Encoding is performed by skipping the current MB and incrementing the MB address. This mode is designed for areas in the picture where little or no change relative to the previously reconstructed picture is detected. FR-PMV: One motion vector for the current MB is predicted and used as an estimate. Motion vector searching is not performed. As only motion compensation is required, the MB is encoded using the header and the motion vector bits. When motion vectors can be accurately predicted, this mode becomes a likely candidate. JVT-A003, § 3.4.5.1.1: Median prediction. In the figure below the vector component E of the indicated block shall be predicted. The prediction is normally formed as the median of A, B and C. However, the prediction may be modified as described below. Notice that it is still referred to as 'median prediction' ⋯ A, B, C, D and E may represent motion vectors from different reference pictures. As an example we may be seeking prediction for a motion vector for E from the last decoded picture. A, B, C and D may represent vectors from 2, 3, 4 and 5 pictures back. Sugahara, 7:2-15. The method can be implemented such that each of the pictures for which prediction information is replaced is a B-picture, and the copy data set includes motion vector information indicating that an overall amount of picture motion of a B-picture with respect to a corresponding

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	temporally preceding or succeeding reference picture is zero, and motion compensated prediction error information indicating that respective amounts of motion compensated prediction error for all macroblocks of the B-picture are zero. That is to say, all macroblocks of the B-picture are indicated as being skipped macroblocks, so that at the time of decoding the MPEG data stream, that B-picture will be decoded as an identical copy of a corresponding reference picture. Sugahara, 21:50-67. wherein said stream is an MPEG compressed video data stream in which each of said reference pictures is an I-picture or a P-picture and each of said predictively encoded pictures is a P-picture or a B-picture, each of said pictures for which prediction information is replaced is a B-picture, and wherein said copy data set includes motion vector information indicating that an overall amount of picture motion of a B-picture with respect to a corresponding temporally preceding reference picture or with respect to a corresponding temporally succeeding reference picture is zero and motion compensated prediction error information indicating that respective amounts of motion compensated prediction error for all macroblocks of said B-picture are zero, to thereby specify all macroblocks of said B-picture as being skipped macroblocks.
25. A method according to claim 1, wherein if the second segment has a zero motion vector and the second segment	The below references, as evidence by the example citations, disclose that if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from a second reference picture immediately preceding the picture second segment belongs to, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
is predicted using motion-compensated prediction from a second reference picture immediately preceding the picture second segment belongs to, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector.	*See, e.g.*, Hwang, 3:25-35: A current frame and a previous frame (in other words, a search frame and a reference frame) of a video signal are inputted to a motion vector detection block 100 and a full search block 200. At the motion vector detection block 100, to find a motion vector of a search block, i.e., a block currently being processed, motion vectors of processed neighboring blocks of the search block together with a 0 vector are examined to select a candidate motion vector, wherein processed blocks refers to blocks whose motion vectors are determined and the processed neighboring blocks are processed blocks neighboring the search block. Hwang, 3:36-56: The processed neighboring blocks whose motion vectors are utilized in detecting the motion vector of the search block B(i,j) are exemplified in FIG. 4. As shown in FIG. 4, the search frame consists of a multiplicity of slices, each of which includes a number of blocks, the number of slices and the number of blocks in each slice being N2 and N1, respectively. The search frame are processed from the upper left corner to the lower right corner. Therefore, among 8 neighboring blocks surrounding the search block B(i,j), motion vectors of 4 neighboring blocks, i.e., an upper left block B(i-1, j-1), an upper middle block B(i,j-1), an upper right block B(i+1,j-1), and a middle left block B(i-1,j), are known when the search block is processed, wherein j represents a slice number and i designates a location of a block in a slice, i and j being positive integers not larger than N1 and N2, respectively. It can be easily known that, if a search block is not located on the boundary of a frame, the number of processed neighboring blocks is 4. In case the search block is on the boundary as in the case of B(1,1), B(1,2) and so on, the number of processed neighboring blocks may be less than 4. Hwang, 3:57-4:12:

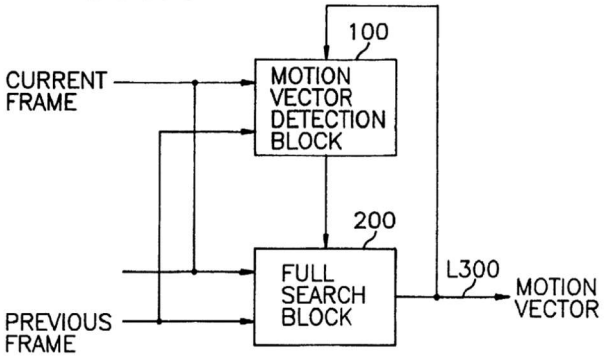
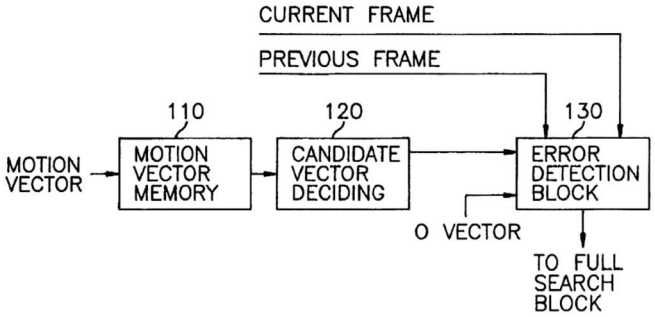
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	After the candidate motion vector is determined, a distortion between the search block and a predicted block corresponding to the candidate motion vector is compared with a predetermined threshold, wherein a predicted block corresponding to a vector is determined as a block of the reference frame which is displaced from the search block by the vector. If the distortion between the search block and the predicted block corresponding to the candidate motion vector is smaller than the threshold, the candidate motion vector is decided as a motion vector of the search block and provided on a line L300 through the full search block 200. Otherwise, a full search trigger signal is applied to the full search block 200 which detects a motion vector of the search block by using a full search block matching method in response to the full search trigger signal. The full search block 200 provides either the motion vector provided from the motion vector detection block 100 or the motion vector determined therein. The motion vector provided from the full search block 200 is fed back to the motion vector detection block 100, to be used in detecting motion vectors of subsequent blocks, e.g., B(i+1,j), of the current frame. Hwang, 4:33-50: Referring to FIG. 2, there is provided a detailed block diagram of the motion vector detection block 100 shown in FIG. 1. The motion vectors of the processed blocks are fed to a motion vector memory 110, to be stored therein. Among them, neighboring vectors which refer to motion vectors of the processed neighboring blocks are selected and coupled to a candidate vector deciding block 120. Referring again to FIG. 4, when the search block B(i,j) is being processed, at least motion vectors of the blocks B(i-1, j-1) to B(N1, j-1) and B(1,j) to B(i-1,j) should be stored at the motion vector memory 110. (Note that B(i, j-1) to B(N1, j-1) are necessary in determining motion vector of remaining blocks, i.e., B(i+1, j) to B(N1, j) included in a jth slice; and B(1, j) to B(i-1, j) are used in determining motion vectors of blocks included in a (j+1)st slice.)

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	Therefore, the motion vector memory 110 should at least have (N1+1) memory spaces each of which can accommodate a motion vector of a processed block. Hwang, 5:11-27: Referring to FIG. 4, in case the number of processed neighboring blocks is 1, (for example, a search block B(2,1)) the motion vector of the processed neighboring block (B(1,1)) may be decided as both of the X and the Y vectors. At the error detection block 130, a distortion between the search block and each of three predicted blocks corresponding to the three candidate vectors inputted thereto is determined, wherein the distortion is a value which represents a difference between two blocks. Of the three candidate vectors, one with a minimum distortion is selected as the candidate motion vector. If the minimum distortion of the candidate motion vector is smaller than the threshold TH, the candidate motion vector is determined as the final motion vector of the search block. Accordingly, a procedure for detecting a motion vector of the search block is completed and the motion vector is provided on L300 through the full search block 200. Hwang, Figs. 1-4:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	FIG. 1  *FIG. 2* 

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:

FIG. 3

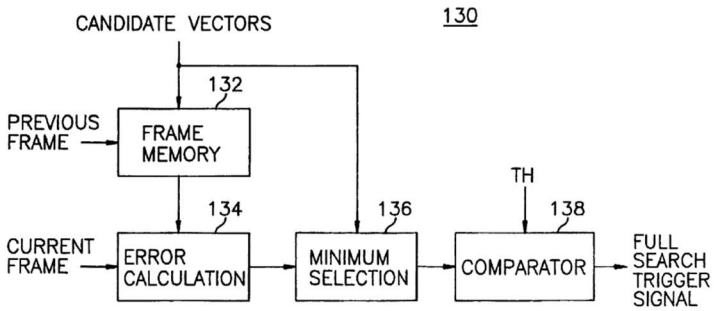
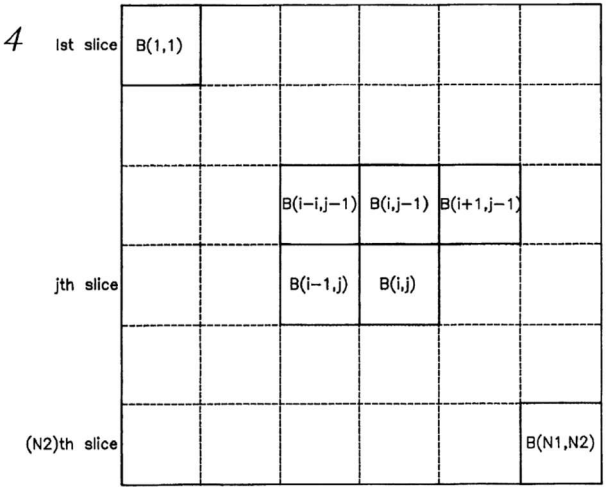


FIG. 4



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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	Lavagetto, 1:12-35: In video coding systems it is well known to use motion estimation techniques so as to achieve compression of the data in a video image signal that represents the video image frames (frames). An exemplary coding system is defined in the CCITT recommendation H.261. Frequently, the motion between an image frame to be encoded and a reference frame already encoded is estimated. The estimation of the motion is encoded and employed as a representation of the frame. Such a representation can be used to reconstruct the encoded frame if the reference frame is available. To this end, all frames of the video image signal are partitioned into a set of blocks comprised of Q×R picture elements (pels). Each block of a frame to be encoded in turn is assigned a motion vector, i.e., a displacement d relative to the location (as defined by a predetermined location in each block) of the block which identifies the location of a same size block in the reference frame that best matches the block. The reference frame is typically a frame in the past relative to the frame to be encoded and most often it is the immediately preceding frame. The motion vector is thus an estimate of the motion of the block from the time instant of the reference frame until the time instant of the frame to be encoded. Skaletzky, 4:21-39: As stated previously, video compression is currently being used in a wide variety of applications. Video compression standards such as the MPEG 2 standard define the output specifications of video encoders. Video encoders functions to compress the video stream from its relatively large original bandwidth to a much smaller bandwidth. The encoded video stream can then be transmitted onto a communication channel or stored in a storage medium, for example. In either case, the bandwidth requirements of the communications channel are greatly reduced and the amount of storage required to hold the video program is also greatly reduced. The encoding of a video stream, in the MPEG 2 standard, for example, requires estimating the changes in the motion between consecutive frames. This process is termed motion estimation.

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	A more in depth discussion of the motion estimation process can be found in "Image and Video Compression Standards, Algorithms and Architectures," by Vasudev Bhaskaran and Konstantinas Konstantinides, Chapter 11, which is incorporated herein by reference. H.263, § 6.1.1: **6.1.1 Differential motion vectors** The macroblock vector is obtained by adding predictors to the vector differences indicated by MVD (see Table 11). For differential coding with four vectors per macroblock, refer to Annex F. In case of one vector per macroblock, the candidate predictors for the differential coding are taken from three surrounding macroblocks as indicated in Figure 11. The predictors are calculated separately for the horizontal and vertical components. In the special cases at the borders of the current GOB or picture, the following decision rules are applied in increasing order: 1) When the corresponding macroblock was coded in INTRA mode (if not in PB-frames mode) or was not coded (COD = 1), the candidate predictor is set to zero. 2) The candidate predictor MV1 is set to zero if the corresponding macroblock is outside the picture (at the left side). 3) Then, the candidate predictors MV2 and MV3 are set to MV1 if the corresponding macroblocks are outside the picture (at the top) or outside the GOB (at the top) if the GOB header of the current GOB is non-empty. 4) Then, the candidate predictor MV3 is set to zero if the corresponding macroblock is outside the picture (at the right side). For each component, the predictor is the median value of the three candidate predictors for this component. Advantage is taken of the fact that the range of motion vector component values is constrained. Each VLC word for MVD represents a pair of difference values. Only one of the pair will yield a macroblock vector component falling within the permitted range [–16, 15.5]. A positive value of the horizontal or vertical component of the motion vector signifies that the prediction is formed from pixels in the previous picture which are spatially to the right or below the pixels being predicted.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	Kuriki, [0005-0006], [0026-0028]: In addition to the above-described series of operations, the encoding apparatus performs an operation of skipping the variable length encoding when the quantization block or the motion vector has the same value as that of the adjacent macroblock or the macroblock at the same position in the previous or subsequent frame, which is referred to as a macroblock skip. Here, a macroblock that is skipped is referred to as a skipped macroblock. More specifically, in the case of a P picture, the encoding device performs the macroblock skip on a macroblock in which the quantization block is 0, that is, all the quantized DCT coefficients in the quantization block are 0 and the motion vector thereof is 0, and In the case of a B picture, the quantization block is 0, and the macroblock skip is performed for a macroblock whose motion vector is the same in magnitude and direction as the motion vector of the left adjacent macroblock of the current macroblock. However, the encoding apparatus sets the start and end of the slice to no macroblock skipping of the located macroblock is performed. … On the other hand, if it is determined in step 23 that the current macroblock is a B picture, the skip determination unit 120 calculates the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock, and determines whether or not the difference is equal to or smaller than the threshold value b (step 26). Here the previous the macro block means a macro block which is an encoding target immediately before the encoding target macro block. In a frame, it is usually a macroblock located on the left side of a macroblock to be encoded. Also, it is assumed that the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is calculated for each of the x component and the y component, and the skip determination unit 120 performs threshold determination for each of the x component and the y

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	component of the difference. That is, the skip determination unit 120 determines whether both the x component and the y component of the difference are equal to or smaller than the threshold value b or whether one or both of the x component and the y component are larger than the threshold value b. It is assumed that the determination in step 26 includes that the direction of prediction (forward prediction, backward prediction, bidirectional prediction, or the like) is the same between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock, that is, the reference frame is the same When it is determined in step 26 that both the x component and the y component of the difference are equal to or smaller than the threshold value b, the skip determination unit 120 determines that the macroblock is a skip macroblock (step 25). The skip determination unit 120 notifies the variable length coding unit 110, the motion vector replacement unit 121, and the addition unit 108 that the macroblock is determined to be a skip macroblock. In this way, in the case of a B picture, the skip determination unit 120 determines that the macroblock is a skip macroblock when the macroblock is not the first or last macroblock of the slice, the quantized block is 0, and the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is equal to or less than the threshold value b in both the x component and the y component. In the present embodiment, the threshold value b is 1.0. That is, when the skip determination unit 120 determines that both the x component and the y component of the motion vector difference between the current macroblock and the immediately preceding macroblock are equal to or smaller than 1.0, it determines that the current macroblock is a skip macroblock. If it is 1.0 or less, as in the case of the P picture, even if the coding of the macro block is omitted, the difference between the original image and the reproduced image is hardly noticeable to the human visual sense, so that there is substantially no problem. Note that the threshold value a and the threshold value b are not limited to 0.5 and 1.0, and, for example, the user may be allowed to set arbitrary values in the skip determination unit 120 within a range in which

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	deterioration in image quality is allowable. Kuriki, [0002], [0004], [0008]: [Prior art] An encoding apparatus for compression-encoding moving image data by the MPEG method compresses moving image data by performing inter-frame prediction by motion compensation (hereinafter, referred to as motion compensated prediction). The frame of the past of a frame, or the future (or the both) to which an object block belongs with motion compensation prediction about the block (it is hereafter called an object block) of the coding subject in a video data (hereinafter, referred to as a reference frame), and obtains a difference (hereinafter, referred to as a prediction error) of each pixel between the target block and the reference block, and a motion vector indicating a relative positional relationship between both blocks. Typically, motion compensated prediction is performed on a macroblock basis. … Here, the encoding type will be described. There are three kinds of encoding types, i.e., I picture, P picture, and B picture, and any one of the three kinds of encoding types is determined for each frame, and each frame is encoded by a different encoding method according to the encoding type. In a frame of an I picture, a luminance signal and two color difference signals of a macro block are subjected to DCT, quantization and variable length coding without performing motion compensation prediction. The I-picture frame serves as a reference frame of a frame of another encoding type. A frame of a P picture is motion-compensated and predicted using a frame of a past I picture or P picture as a reference frame, and a prediction error after the motion-compensated prediction is subjected to DCT, quantization, and variable length coding. The frame of the P picture serves as a reference frame of a macroblock of another P picture or B picture. The encoding method of the P picture is called unidirectional prediction. The frame of the B picture is motion-compensated and predicted using the frame of the past or future (or both) I picture or P picture as a reference frame, and the resulting prediction error is

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	subjected to DCT, quantization, and variable length coding. It does not become a reference frame for other frames. The B-picture encoding method is called bidirectional prediction because it is predicted from both the past and future directions …. When a decoding device for decoding moving image data detects that there is a skip macroblock from an address of a macroblock, the decoding device performs: The P picture is decoded by using a block at the same position as the skip macro block in the reference frame of the picture, and the B picture is decoded by using the motion vector of the left adjacent macro block. Lee, 63-64: Thus inter coding can be performed according to one of the following 15 modes of operation: SKIP: The current MB is replaced by the MB at the same spatial location in the previous reconstructed picture. Encoding is performed by skipping the current MB and incrementing the MB address. This mode is designed for areas in the picture where little or no change relative to the previously reconstructed picture is detected. FR-PMV: One motion vector for the current MB is predicted and used as an estimate. Motion vector searching is not performed. As only motion compensation is required, the MB is encoded using the header and the motion vector bits. When motion vectors can be accurately predicted, this mode becomes a likely candidate. JVT-A003, § 3.4.5.1.1: Median prediction. In the figure below the vector component E of the indicated block shall be predicted. The prediction is normally formed as the median of A, B and C. However, the prediction may be modified as described below. Notice that it is still referred to as 'median prediction' ⋯ A, B, C, D and E may represent motion vectors from different reference pictures. As an example we may be seeking prediction for a motion vector for E from the last decoded

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	picture. A, B, C and D may represent vectors from 2, 3, 4 and 5 pictures back. Sugahara, 7:2-15. The method can be implemented such that each of the pictures for which prediction information is replaced is a B-picture, and the copy data set includes motion vector information indicating that an overall amount of picture motion of a B-picture with respect to a corresponding temporally preceding or succeeding reference picture is zero, and motion compensated prediction error information indicating that respective amounts of motion compensated prediction error for all macroblocks of the B-picture are zero. That is to say, all macroblocks of the B-picture are indicated as being skipped macroblocks, so that at the time of decoding the MPEG data stream, that B-picture will be decoded as an identical copy of a corresponding reference picture. Sugahara, 21:50-67. wherein said stream is an MPEG compressed video data stream in which each of said reference pictures is an I-picture or a P-picture and each of said predictively encoded pictures is a P-picture or a B-picture, each of said pictures for which prediction information is replaced is a B-picture, and wherein said copy data set includes motion vector information indicating that an overall amount of picture motion of a B-picture with respect to a corresponding temporally preceding reference picture or with respect to a corresponding temporally succeeding reference picture is zero and motion compensated prediction error information indicating that respective amounts of motion compensated prediction error for all macroblocks of said B-picture are zero, to thereby specify all macroblocks of said B-picture as being skipped macroblocks.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
28 A method according to claim 1, further comprising: deriving the predicted non-zero motion vector based at least in part on the motion vector of the second segment.	The below references, as evidence by the example citations, disclose deriving the predicted non-zero motion vector based at least in part on the motion vector of the second segment. *See, e.g.*, Hwang, 3:25-35: A current frame and a previous frame (in other words, a search frame and a reference frame) of a video signal are inputted to a motion vector detection block 100 and a full search block 200. At the motion vector detection block 100, to find a motion vector of a search block, i.e., a block currently being processed, motion vectors of processed neighboring blocks of the search block together with a 0 vector are examined to select a candidate motion vector, wherein processed blocks refers to blocks whose motion vectors are determined and the processed neighboring blocks are processed blocks neighboring the search block. Hwang, 3:36-56: The processed neighboring blocks whose motion vectors are utilized in detecting the motion vector of the search block B(i,j) are exemplified in FIG. 4. As shown in FIG. 4, the search frame consists of a multiplicity of slices, each of which includes a number of blocks, the number of slices and the number of blocks in each slice being N2 and N1, respectively. The search frame are processed from the upper left corner to the lower right corner. Therefore, among 8 neighboring blocks surrounding the search block B(i,j), motion vectors of 4 neighboring blocks, i.e., an upper left block B(i-1, j-1), an upper middle block B(i,j-1), an upper right block B(i+1,j-1), and a middle left block B(i-1,j), are known when the search block is processed, wherein j represents a slice number and i designates a location of a block in a slice, i and j being positive integers not larger than N1 and N2, respectively. It can be easily known that, if a search block is not located on the boundary of a frame, the number of processed neighboring blocks is 4. In case the search block is on the boundary as in the case of

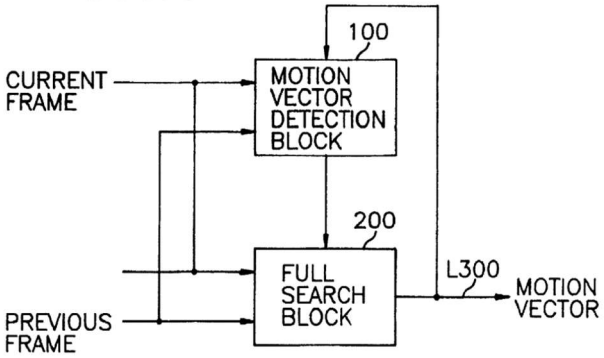
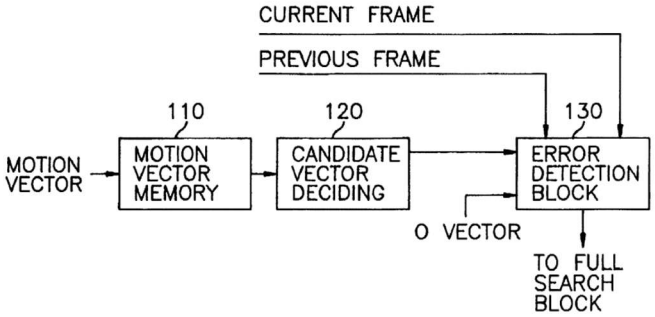
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	B(1,1), B(1,2) and so on, the number of processed neighboring blocks may be less than 4. Hwang, 3:57-4:12: After the candidate motion vector is determined, a distortion between the search block and a predicted block corresponding to the candidate motion vector is compared with a predetermined threshold, wherein a predicted block corresponding to a vector is determined as a block of the reference frame which is displaced from the search block by the vector. If the distortion between the search block and the predicted block corresponding to the candidate motion vector is smaller than the threshold, the candidate motion vector is decided as a motion vector of the search block and provided on a line L300 through the full search block 200. Otherwise, a full search trigger signal is applied to the full search block 200 which detects a motion vector of the search block by using a full search block matching method in response to the full search trigger signal. The full search block 200 provides either the motion vector provided from the motion vector detection block 100 or the motion vector determined therein. The motion vector provided from the full search block 200 is fed back to the motion vector detection block 100, to be used in detecting motion vectors of subsequent blocks, e.g., B(i+1,j), of the current frame. Hwang, 4:33-50: Referring to FIG. 2, there is provided a detailed block diagram of the motion vector detection block 100 shown in FIG. 1. The motion vectors of the processed blocks are fed to a motion vector memory 110, to be stored therein. Among them, neighboring vectors which refer to motion vectors of the processed neighboring blocks are selected and coupled to a candidate vector deciding block 120. Referring again to FIG. 4, when the search block B(i,j) is being processed, at least motion vectors of the blocks B(i-1, j-1) to B(N1, j-1) and B(1,j) to B(i-1,j) should be stored at the

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	motion vector memory 110. (Note that B(i, j-1) to B(N1, j-1) are necessary in determining motion vector of remaining blocks, i.e., B(i+1, j) to B(N1, j) included in a jth slice; and B(1, j) to B(i-1, j) are used in determining motion vectors of blocks included in a (j+1)st slice.) Therefore, the motion vector memory 110 should at least have (N1+1) memory spaces each of which can accommodate a motion vector of a processed block. Hwang, 5:11-27: Referring to FIG. 4, in case the number of processed neighboring blocks is 1, (for example, a search block B(2,1)) the motion vector of the processed neighboring block (B(1,1)) may be decided as both of the X and the Y vectors. At the error detection block 130, a distortion between the search block and each of three predicted blocks corresponding to the three candidate vectors inputted thereto is determined, wherein the distortion is a value which represents a difference between two blocks. Of the three candidate vectors, one with a minimum distortion is selected as the candidate motion vector. If the minimum distortion of the candidate motion vector is smaller than the threshold TH, the candidate motion vector is determined as the final motion vector of the search block. Accordingly, a procedure for detecting a motion vector of the search block is completed and the motion vector is provided on L300 through the full search block 200. Hwang, Figs. 1-4:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	FIG. 1  *FIG. 2* 

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:

FIG. 3

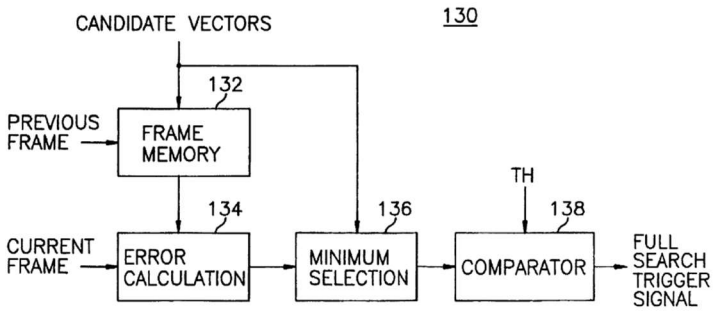
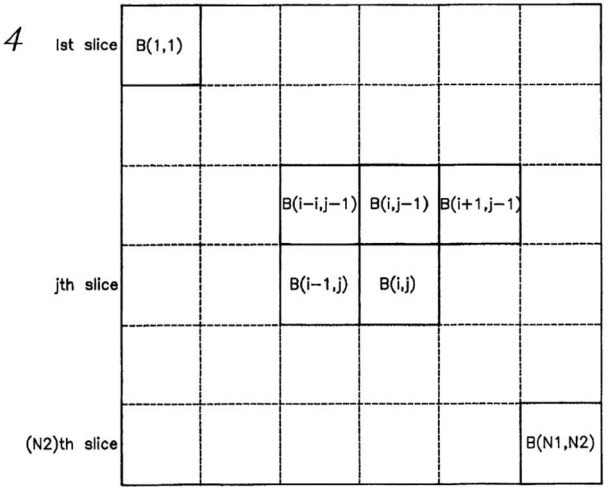


FIG. 4



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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	H.263, § 6.1.1: **6.1.1 Differential motion vectors** The macroblock vector is obtained by adding predictors to the vector differences indicated by MVD (see Table 11). For differential coding with four vectors per macroblock, refer to Annex F. In case of one vector per macroblock, the candidate predictors for the differential coding are taken from three surrounding macroblocks as indicated in Figure 11. The predictors are calculated separately for the horizontal and vertical components. In the special cases at the borders of the current GOB or picture, the following decision rules are applied in increasing order: 1) When the corresponding macroblock was coded in INTRA mode (if not in PB-frames mode) or was not coded (COD = 1), the candidate predictor is set to zero. 2) The candidate predictor MV1 is set to zero if the corresponding macroblock is outside the picture (at the left side). 3) Then, the candidate predictors MV2 and MV3 are set to MV1 if the corresponding macroblocks are outside the picture (at the top) or outside the GOB (at the top) if the GOB header of the current GOB is non-empty. 4) Then, the candidate predictor MV3 is set to zero if the corresponding macroblock is outside the picture (at the right side). For each component, the predictor is the median value of the three candidate predictors for this component. Advantage is taken of the fact that the range of motion vector component values is constrained. Each VLC word for MVD represents a pair of difference values. Only one of the pair will yield a macroblock vector component falling within the permitted range [–16, 15.5]. A positive value of the horizontal or vertical component of the motion vector signifies that the prediction is formed from pixels in the previous picture which are spatially to the right or below the pixels being predicted. Kuriki, [0005-0006], [0026-0028]: In addition to the above-described series of operations, the encoding apparatus performs an

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	operation of skipping the variable length encoding when the quantization block or the motion vector has the same value as that of the adjacent macroblock or the macroblock at the same position in the previous or subsequent frame, which is referred to as a macroblock skip. Here, a macroblock that is skipped is referred to as a skipped macroblock. More specifically, in the case of a P picture, the encoding device performs the macroblock skip on a macroblock in which the quantization block is 0, that is, all the quantized DCT coefficients in the quantization block are 0 and the motion vector thereof is 0, and In the case of a B picture, the quantization block is 0, and the macroblock skip is performed for a macroblock whose motion vector is the same in magnitude and direction as the motion vector of the left adjacent macroblock of the current macroblock. However, the encoding apparatus sets the start and end of the slice to no macroblock skipping of the located macroblock is performed. … On the other hand, if it is determined in step 23 that the current macroblock is a B picture, the skip determination unit 120 calculates the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock, and determines whether or not the difference is equal to or smaller than the threshold value b (step 26). Here the previous the macro block means a macro block which is an encoding target immediately before the encoding target macro block. In a frame, it is usually a macroblock located on the left side of a macroblock to be encoded. Also, it is assumed that the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is calculated for each of the x component and the y component, and the skip determination unit 120 performs threshold determination for each of the x component and the y component of the difference. That is, the skip determination unit 120 determines whether both the x component and the y component of the difference are equal to or smaller than the threshold value b or whether one or both of the x component and the y component are larger than the threshold value b. It is assumed that the determination in step 26 includes that the direction of prediction (forward prediction, backward prediction, bidirectional prediction, or the

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	like) is the same between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock, that is, the reference frame is the same When it is determined in step 26 that both the x component and the y component of the difference are equal to or smaller than the threshold value b, the skip determination unit 120 determines that the macroblock is a skip macroblock (step 25). The skip determination unit 120 notifies the variable length coding unit 110, the motion vector replacement unit 121, and the addition unit 108 that the macroblock is determined to be a skip macroblock. In this way, in the case of a B picture, the skip determination unit 120 determines that the macroblock is a skip macroblock when the macroblock is not the first or last macroblock of the slice, the quantized block is 0, and the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is equal to or less than the threshold value b in both the x component and the y component. In the present embodiment, the threshold value b is 1.0. That is, when the skip determination unit 120 determines that both the x component and the y component of the motion vector difference between the current macroblock and the immediately preceding macroblock are equal to or smaller than 1.0, it determines that the current macroblock is a skip macroblock. If it is 1.0 or less, as in the case of the P picture, even if the coding of the macro block is omitted, the difference between the original image and the reproduced image is hardly noticeable to the human visual sense, so that there is substantially no problem. Note that the threshold value a and the threshold value b are not limited to 0.5 and 1.0, and, for example, the user may be allowed to set arbitrary values in the skip determination unit 120 within a range in which deterioration in image quality is allowable. Sugahara, 8:47-56. An apparatus for achieving the third objective set out above can be basically similarly configured, but with the copy data specifying a fixed non-zero size and direction for a motion

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	vector of a predictively encoded picture, and zero amounts of motion compensated prediction error for each of the macroblocks of the picture, and with the apparatus also including means for operating on successive I-pictures such as to produce appropriate amounts of successive displacement of these pictures (with respect to a display screen) when the MPEG data are decoded and displayed. Sugahara, 13:1-8. With a second mode of operation of this embodiment, referring to FIG. 6, in addition to such conversion of each B-picture, each P-picture 32 is also converted by the stream portion changeover section 25 such that all of the macroblocks become skipped macroblocks with forward prediction, i.e., the MPEG data of the P-picture 31 are re-encoded as code which expresses a copy of the preceding reference picture. Sugahara, 17:20-29. For example, if the second mode of processing described above is modified such that each P-picture copy stream portion and B-picture copy stream portion specifies a picture as having a fixed non-zero motion vector in a fixed direction, and all of the P and B-pictures of a GOP are subjected to copy data replacement, then the result will be that the final displayed picture will be successively shifted across the display screen, in the direction of the motion vector, when that GOP is decoded and a resultant video signal generated.
29. A method according to claim 1, further comprising: deriving the	The below references, as evidence by the example citations, disclose deriving the predicted non-zero motion vector based at least in part on the motion vector of the second segment and motion vector of a third segment neighboring the first segment.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
predicted non-zero motion vector based at least in part on the motion vector of the second segment and motion vector of a third segment neighboring the first segment.	*See, e.g.*, Hwang, 3:25-35: > A current frame and a previous frame (in other words, a search frame and a reference frame) of a video signal are inputted to a motion vector detection block 100 and a full search block 200. At the motion vector detection block 100, to find a motion vector of a search block, i.e., a block currently being processed, motion vectors of processed neighboring blocks of the search block together with a 0 vector are examined to select a candidate motion vector, wherein processed blocks refers to blocks whose motion vectors are determined and the processed neighboring blocks are processed blocks neighboring the search block. Hwang, 3:36-56: > The processed neighboring blocks whose motion vectors are utilized in detecting the motion vector of the search block B(i,j) are exemplified in FIG. 4. As shown in FIG. 4, the search frame consists of a multiplicity of slices, each of which includes a number of blocks, the number of slices and the number of blocks in each slice being N2 and N1, respectively. The search frame are processed from the upper left corner to the lower right corner. Therefore, among 8 neighboring blocks surrounding the search block B(i,j), motion vectors of 4 neighboring blocks, i.e., an upper left block B(i-1, j-1), an upper middle block B(i,j-1), an upper right block B(i+1,j-1), and a middle left block B(i-1,j), are known when the search block is processed, wherein j represents a slice number and i designates a location of a block in a slice, i and j being positive integers not larger than N1 and N2, respectively. It can be easily known that, if a search block is not located on the boundary of a frame, the number of processed neighboring blocks is 4. In case the search block is on the boundary as in the case of B(1,1), B(1,2) and so on, the number of processed neighboring blocks may be less than 4. Hwang, 3:57-4:12:

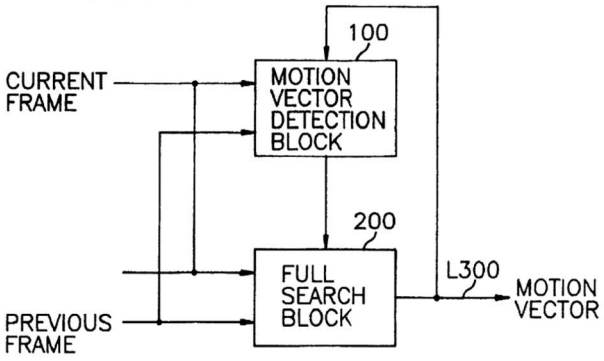
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	After the candidate motion vector is determined, a distortion between the search block and a predicted block corresponding to the candidate motion vector is compared with a predetermined threshold, wherein a predicted block corresponding to a vector is determined as a block of the reference frame which is displaced from the search block by the vector. If the distortion between the search block and the predicted block corresponding to the candidate motion vector is smaller than the threshold, the candidate motion vector is decided as a motion vector of the search block and provided on a line L300 through the full search block 200. Otherwise, a full search trigger signal is applied to the full search block 200 which detects a motion vector of the search block by using a full search block matching method in response to the full search trigger signal. The full search block 200 provides either the motion vector provided from the motion vector detection block 100 or the motion vector determined therein. The motion vector provided from the full search block 200 is fed back to the motion vector detection block 100, to be used in detecting motion vectors of subsequent blocks, e.g., B(i+1,j), of the current frame. Hwang, 4:33-50: Referring to FIG. 2, there is provided a detailed block diagram of the motion vector detection block 100 shown in FIG. 1. The motion vectors of the processed blocks are fed to a motion vector memory 110, to be stored therein. Among them, neighboring vectors which refer to motion vectors of the processed neighboring blocks are selected and coupled to a candidate vector deciding block 120. Referring again to FIG. 4, when the search block B(i,j) is being processed, at least motion vectors of the blocks B(i-1, j-1) to B(N1, j-1) and B(1,j) to B(i-1,j) should be stored at the motion vector memory 110. (Note that B(i, j-1) to B(N1, j-1) are necessary in determining motion vector of remaining blocks, i.e., B(i+1, j) to B(N1, j) included in a jth slice; and B(1, j) to B(i-1, j) are used in determining motion vectors of blocks included in a (j+1)st slice.)

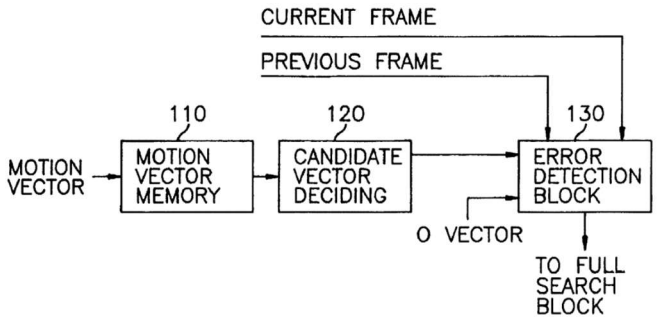
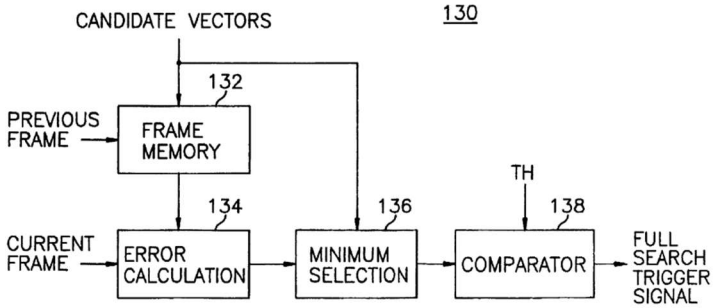
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	Therefore, the motion vector memory 110 should at least have (N1+1) memory spaces each of which can accommodate a motion vector of a processed block. Hwang, 5:11-27: Referring to FIG. 4, in case the number of processed neighboring blocks is 1, (for example, a search block B(2,1)) the motion vector of the processed neighboring block (B(1,1)) may be decided as both of the X and the Y vectors. At the error detection block 130, a distortion between the search block and each of three predicted blocks corresponding to the three candidate vectors inputted thereto is determined, wherein the distortion is a value which represents a difference between two blocks. Of the three candidate vectors, one with a minimum distortion is selected as the candidate motion vector. If the minimum distortion of the candidate motion vector is smaller than the threshold TH, the candidate motion vector is determined as the final motion vector of the search block. Accordingly, a procedure for detecting a motion vector of the search block is completed and the motion vector is provided on L300 through the full search block 200. Hwang, 5:32-64: Referring to FIG. 3, there is shown a more detailed block diagram of the error detection block 130 shown in FIG. 2. The previous frame is coupled to a frame memory 132 which provides the three predicted blocks which are blocks of the previous frame displaced from the search block by the X-vector, the Y-vector and the 0 vector, respectively, in response to the three candidate vectors provided from the candidate vector deciding block 120. The three predicted blocks are fed to an error calculator 134 which calculates a distortion between the search block and each of the three predicted blocks. At a minimum selection block 136, a candidate vector which corresponds to a minimum distortion is selected as the candidate motion vector. The candidate motion vector

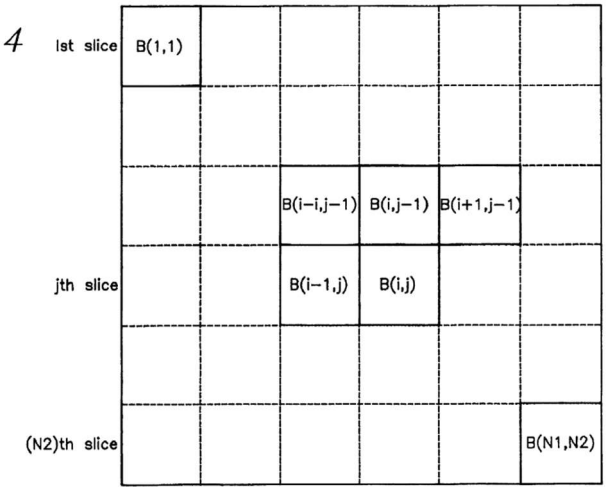
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	and the minimum distortion are fed to a comparator 138. At the comparator 138, the minimum distortion is compared with the predetermined threshold TH. If the minimum distortion is smaller than TH, the candidate motion vector is provided as the motion vector of the search block; and otherwise, the full search trigger signal is applied to the full search block 200. As described above, in case moving objects occupy a small portion of the video signal, motion vectors of neighboring blocks are likely to be similar. In addition, if the background is stationary or is moving mainly in a horizontal or a vertical direction, motion vectors are likely to be similar to the 0 vector, the horizontal vector or the vertical vector. Therefore, in this situation, the candidate motion vector is likely to be determined as the motion vector of the search block, to thereby reduce the computational burden entailed in determining the motion vector by using the conventional method. Hwang, Figs. 1-4: *FIG. 1* 

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	FIG. 2  *FIG. 3* 

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	FIG. 4  H.263, § 6.1.1:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	6.1.1 Differential motion vectors The macroblock vector is obtained by adding predictors to the vector differences indicated by MVD (see Table 11). For differential coding with four vectors per macroblock, refer to Annex F. In case of one vector per macroblock, the candidate predictors for the differential coding are taken from three surrounding macroblocks as indicated in Figure 11. The predictors are calculated separately for the horizontal and vertical components. In the special cases at the borders of the current GOB or picture, the following decision rules are applied in increasing order: 1) When the corresponding macroblock was coded in INTRA mode (if not in PB-frames mode) or was not coded (COD = 1), the candidate predictor is set to zero. 2) The candidate predictor MV1 is set to zero if the corresponding macroblock is outside the picture (at the left side). 3) Then, the candidate predictors MV2 and MV3 are set to MV1 if the corresponding macroblocks are outside the picture (at the top) or outside the GOB (at the top) if the GOB header of the current GOB is non-empty. 4) Then, the candidate predictor MV3 is set to zero if the corresponding macroblock is outside the picture (at the right side). For each component, the predictor is the median value of the three candidate predictors for this component. Advantage is taken of the fact that the range of motion vector component values is constrained. Each VLC word for MVD represents a pair of difference values. Only one of the pair will yield a macroblock vector component falling within the permitted range [–16, 15.5]. A positive value of the horizontal or vertical component of the motion vector signifies that the prediction is formed from pixels in the previous picture which are spatially to the right or below the pixels being predicted. Kuriki, [0005-0006], [0026-0028]: In addition to the above-described series of operations, the encoding apparatus performs an operation of skipping the variable length encoding when the quantization block or the motion vector has the same value as that of the adjacent macroblock or the macroblock at the same

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	position in the previous or subsequent frame, which is referred to as a macroblock skip. Here, a macroblock that is skipped is referred to as a skipped macroblock. More specifically, in the case of a P picture, the encoding device performs the macroblock skip on a macroblock in which the quantization block is 0, that is, all the quantized DCT coefficients in the quantization block are 0 and the motion vector thereof is 0, and In the case of a B picture, the quantization block is 0, and the macroblock skip is performed for a macroblock whose motion vector is the same in magnitude and direction as the motion vector of the left adjacent macroblock of the current macroblock. However, the encoding apparatus sets the start and end of the slice to no macroblock skipping of the located macroblock is performed. … On the other hand, if it is determined in step 23 that the current macroblock is a B picture, the skip determination unit 120 calculates the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock, and determines whether or not the difference is equal to or smaller than the threshold value b (step 26). Here the previous the macro block means a macro block which is an encoding target immediately before the encoding target macro block. In a frame, it is usually a macroblock located on the left side of a macroblock to be encoded. Also, it is assumed that the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is calculated for each of the x component and the y component, and the skip determination unit 120 performs threshold determination for each of the x component and the y component of the difference. That is, the skip determination unit 120 determines whether both the x component and the y component of the difference are equal to or smaller than the threshold value b or whether one or both of the x component and the y component are larger than the threshold value b. It is assumed that the determination in step 26 includes that the direction of prediction (forward prediction, backward prediction, bidirectional prediction, or the like) is the same between the motion vector of the current macroblock and the motion vector of

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	the immediately preceding macroblock, that is, the reference frame is the same When it is determined in step 26 that both the x component and the y component of the difference are equal to or smaller than the threshold value b, the skip determination unit 120 determines that the macroblock is a skip macroblock (step 25). The skip determination unit 120 notifies the variable length coding unit 110, the motion vector replacement unit 121, and the addition unit 108 that the macroblock is determined to be a skip macroblock. In this way, in the case of a B picture, the skip determination unit 120 determines that the macroblock is a skip macroblock when the macroblock is not the first or last macroblock of the slice, the quantized block is 0, and the difference between the motion vector of the current macroblock and the motion vector of the immediately preceding macroblock is equal to or less than the threshold value b in both the x component and the y component. In the present embodiment, the threshold value b is 1.0. That is, when the skip determination unit 120 determines that both the x component and the y component of the motion vector difference between the current macroblock and the immediately preceding macroblock are equal to or smaller than 1.0, it determines that the current macroblock is a skip macroblock. If it is 1.0 or less, as in the case of the P picture, even if the coding of the macro block is omitted, the difference between the original image and the reproduced image is hardly noticeable to the human visual sense, so that there is substantially no problem. Note that the threshold value a and the threshold value b are not limited to 0.5 and 1.0, and, for example, the user may be allowed to set arbitrary values in the skip determination unit 120 within a range in which deterioration in image quality is allowable. Sugahara, 8:47-56. An apparatus for achieving the third objective set out above can be basically similarly configured, but with the copy data specifying a fixed non-zero size and direction for a motion vector of a predictively encoded picture, and zero amounts of motion compensated prediction

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	error for each of the macroblocks of the picture, and with the apparatus also including means for operating on successive I-pictures such as to produce appropriate amounts of successive displacement of these pictures (with respect to a display screen) when the MPEG data are decoded and displayed. Sugahara, 13:1-8. With a second mode of operation of this embodiment, referring to FIG. 6, in addition to such conversion of each B-picture, each P-picture 32 is also converted by the stream portion changeover section 25 such that all of the macroblocks become skipped macroblocks with forward prediction, i.e., the MPEG data of the P-picture 31 are re-encoded as code which expresses a copy of the preceding reference picture. Sugahara, 17:20-29. For example, if the second mode of processing described above is modified such that each P-picture copy stream portion and B-picture copy stream portion specifies a picture as having a fixed non-zero motion vector in a fixed direction, and all of the P and B-pictures of a GOP are subjected to copy data replacement, then the result will be that the final displayed picture will be successively shifted across the display screen, in the direction of the motion vector, when that GOP is decoded and a resultant video signal generated.
30. A method according to claim 1, wherein no residual information is provided for the first	The below references, as evidence by the example citations, disclose that no residual information is provided for the first segment in the encoded bitstream. *See, e.g.*,

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
segment in the encoded bitstream.	H.263, § 5.3.1: A bit which when set to "0" signals that the macroblock is coded. If set to "1", no further information is transmitted for this macroblock; in that case the decoder shall treat the macroblock as an INTER macroblock with motion vector for the whole block equal to zero and with no coefficient data. COD is only present in pictures that are not of type "INTRA", for each macroblock in these pictures. NOTE – In Advanced Prediction mode (see Annex F), overlapped block motion compensation is also performed if COD is set to "1"; and in Deblocking Filter mode (see Annex J), the deblocking filter can also affect the values of some pixels of macroblocks having COD is set to "1". Sugahara, 8:47-56. An apparatus for achieving the third objective set out above can be basically similarly configured, but with the copy data specifying a fixed non-zero size and direction for a motion vector of a predictively encoded picture, and zero amounts of motion compensated prediction error for each of the macroblocks of the picture, and with the apparatus also including means for operating on successive I-pictures such as to produce appropriate amounts of successive displacement of these pictures (with respect to a display screen) when the MPEG data are decoded and displayed.
32. A method according to claim 7, wherein if the second segment has a zero motion vector, the zero motion vector is	The below references, as evidence by the example citations, disclose that if the second segment has a zero motion vector, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector.	*See, e.g.*, *See claim 6.*
34[preamble] A method according to claim 7, wherein if the second segment has a non-zero motion vector,	The below references, as evidence by the example citations, disclose the second segment has a non-zero motion vector. *See, e.g.*, *See limitation 23[preamble].*
34[a] the method further comprising deriving the predicted non-zero motion vector based at least in part on the motion vector of the second segment; and	The below references, as evidence by the example citations, disclose deriving the predicted non-zero motion vector based at least in part on the motion vector of the second segment. *See, e.g.*, *See limitation 23[a].*

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
34[b] the predicted non-zero motion vector is assigned for the skip coding mode of the first segment; and	The below references, as evidence by the example citations, disclose the predicted non-zero motion vector is assigned for the skip coding mode of the first segment. *See, e.g.*, *See limitation 23[b].*
34[c] the prediction for the first segment is formed by a motion compensated prediction with respect to the reference frame based at least in part on the predicted non-zero motion vector.	The below references, as evidence by the example citations, disclose the prediction for the first segment is formed by a motion compensated prediction with respect to the reference frame based at least in part on the predicted non-zero motion vector. *See, e.g.*, *See limitation 23[c].*
36. A method according to claim 7, wherein if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from the	The below references, as evidence by the example citations, disclose that if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from the reference picture, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector. *See, e.g.*,

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
reference picture, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector.	*See claim 24.*
39 A method according to claim 7, further comprising: deriving the predicted non-zero motion vector based at least in part on the motion vector of the second segment.	The below references, as evidence by the example citations, disclose deriving the predicted non-zero motion vector based at least in part on the motion vector of the second segment. *See, e.g.*, *See claim 28.*
40 A method according to claim 7, further comprising: deriving the predicted non-zero motion vector based	The below references, as evidence by the example citations, disclose deriving the predicted non-zero motion vector based at least in part on the motion vector of the second segment and motion vector of a third segment neighboring the first segment. *See, e.g.*,

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
at least in part on the motion vector of the second segment and motion vector of a third segment neighboring the first segment.	*See claim 29.*
41. A method according to claim 7, wherein no residual information is provided for the first segment in the encoded bitstream.	The below references, as evidence by the example citations, disclose that no residual information is provided for the first segment in the encoded bitstream. *See, e.g.*, *See claim 30*
43. A method according to claim 1, wherein if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from a second reference picture immediately preceding the picture	The below references, as evidence by the example citations, disclose that if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from a second reference picture immediately preceding the picture second segment belongs to, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector. *See, e.g.*, *See claim 25.*

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
second segment belongs to, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector.	
44[preamble] An encoder according to claim 10, wherein if the second segment has a non-zero motion vector,	The below references, as evidence by the example citations, disclose that the second segment has a non-zero motion vector. *See, e.g.*, *See limitation 23[preamble].*
44[a] the motion estimation block is further arranged to derive the predicted non-zero motion	The below references, as evidence by the example citations, disclose the motion estimation block is further arranged to derive the predicted non-zero motion vector based at least in part on the motion vector of the second segment.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
vector based at least in part on the motion vector of the second segment; and	*See limitation 23[a].* *See, e.g.*, The '808 patent, 4:44-60: > In order to illustrate the operation of a generic video coding system in greater detail, reference will now be made to the exemplary video encoder and video decoder illustrated in FIGS. 1 and 2 of the accompanying drawings. The video encoder 100 of FIG. 1 employs a combination of INTRA- and INTER-coding to produce a compressed (encoded) video bit-stream and decoder 200 of FIG. 2 is arranged to receive and decode the video bit-stream produced by encoder 100 in order to produce a reconstructed video sequence. Throughout the following description it will be assumed that the luminance component of a macroblock comprises 16×16 pixels arranged as an array of 4, 8×8 blocks, and that the associated chrominance components are spatially sub-sampled by a factor of two in the horizontal and vertical directions to form 8×8 blocks, as depicted in FIG. 3. Extension of the description to other block sizes and other sub-sampling schemes will be apparent to those of ordinary skill in the art. The '808 patent, 3:61-4:12 > The video encoder 100 comprises an input 101 for receiving a digital video signal from a camera or other video source (not shown). It also comprises a transformation unit 104 which is arranged to perform a block-based discrete cosine transform (DCT), a quantizer 106, an inverse quantizer 108, an inverse transformation unit 110, arranged to perform an inverse block-based discrete cosine transform (IDCT), combiners 112 and 116, and a frame store 120. The encoder further comprises a motion estimator 130, a motion field coder 140 and a motion compensated predictor 150. Switches 102 and 114 are operated co-operatively by control manager 160 to switch the encoder between an INTRA-mode of video encoding and an INTER-mode of video encoding. The encoder 100 also comprises a video multiplex coder 170 which forms a single bit-stream from the various types of information produced by the encoder 100 for further

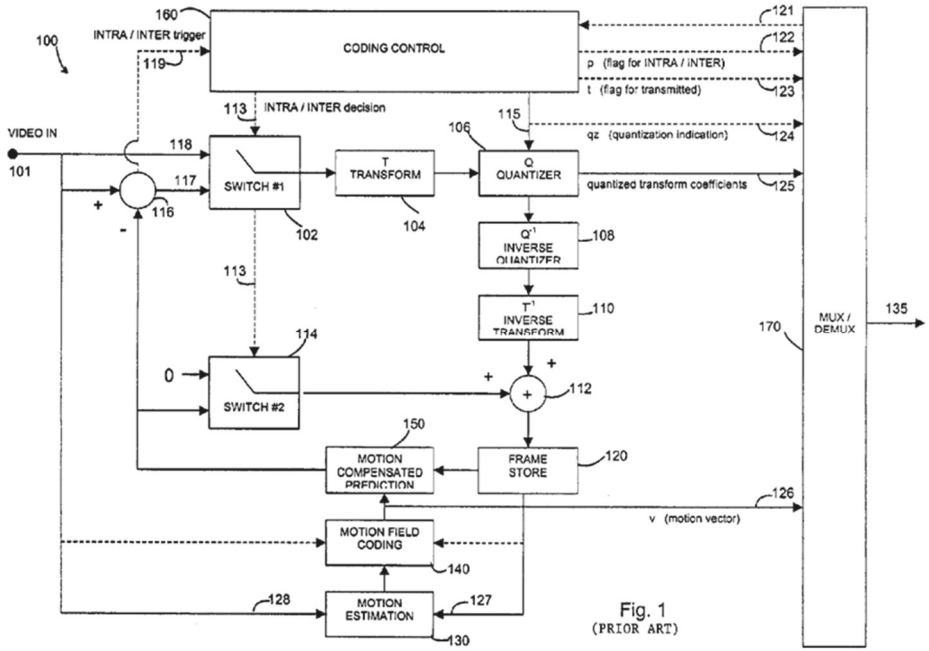
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	transmission to a remote receiving terminal or, for example, for storage on a mass storage medium, such as a computer hard drive (not shown). The '808 patent, 7:30-8:18: The first step in forming a prediction for a macroblock of the current frame is performed by motion estimation block 130. The motion estimation block 130 receives the blocks of luminance and chrominance values which make up the current macroblock of the frame to be coded via line 128. It then performs a block matching operation in order to identify a region in the reference frame that corresponds best with the current macroblock. In order to perform the block matching operation, motion estimation block 130 accesses reference frame data stored in frame store 120 via line 127. More specifically, motion estimation block 130 performs block-matching by calculating difference values (e.g. sums of absolute differences) representing the difference in pixel values between the macroblock under examination and candidate best-matching regions of pixels from a reference frame stored in the frame store 120. A difference value is produced for candidate regions at all possible offsets within a predefined search region of the reference frame and motion estimation block 130 determines the smallest calculated difference value. The candidate region that yields the smallest difference value is selected as the best-matching region. The offset between the current macroblock and the best-matching region identified in the reference frame defines a "motion vector" for the macroblock in question. The motion vector typically comprises a pair of numbers, one describing the horizontal (Δx) between the current macroblock and the best-matching region of the reference frame, the other representing the vertical displacement (Δy). Once the motion estimation block 130 has produced a motion vector for the macroblock, it outputs the motion vector to the motion field coding block 140. The motion field coding block 140 approximates the motion vector received from motion estimation block 130 using a motion model comprising a set of basis functions and motion coefficients. More specifically, the motion field coding block 140 represents the motion vector as a set of motion coefficient values

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	which, when multiplied by the basis functions, form an approximation of the motion vector. Typically, a translational motion model having only two motion coefficients and basis functions is used, but motion models of greater complexity may also be used. The motion coefficients are passed from motion field coding block 140 to motion compensated prediction block 150. Motion compensated prediction block 150 also receives the best-matching region of pixel values identified by motion estimation block 130 from frame store 120. Using the approximate representation of the motion vector generated by motion field coding block 140 and the pixel values of the best-matching region of pixels from the reference frame, motion compensated prediction block 150 generates an array of predicted pixel values for each block of the current macroblock. Each block of predicted pixel values is passed to combiner 116 where the predicted pixel values are subtracted from the actual (input) pixel values in the corresponding block of the current macroblock. In this way a set of prediction error blocks for the macroblock is obtained. The '808 patent, 16:1-14: FIG. 6 is a schematic block diagram of a video encoder 600 implemented according to an embodiment of the invention. When encoding frames of a digital video sequence, encoder 600 operates in a manner similar to that previously described in connection with the prior art video encoder of FIG. 1 to generate INTRA-coded and INTER-coded compressed video frames. The structure of the video encoder shown in FIG. 6 is substantially identical to that of the prior art video encoder shown in FIG. 1, with appropriate modifications to the motion estimation part necessary to implement the video encoding method according to the invention. All parts of the video encoder which implement functions and operate in a manner identical to the previously described prior art video encoder are identified with identical reference numbers. The '808 patent, FIG. 1:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	 Fig. 1 (PRIOR ART)
44[b] the predicted non-zero motion vector is assigned for the skip coding mode	The below references, as evidence by the example citations, disclose that the predicted non-zero motion vector is assigned for the skip coding mode for the first segment.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
for the first segment; and	*See, e.g.*, *See limitation 23[b].*
44[c] the prediction for the first segment is formed by a motion compensated prediction with respect to the reference frame based at least in part on the predicted non-zero motion vector.	The below references, as evidence by the example citations, disclose that the prediction for the first segment is formed by a motion compensated prediction with respect to the reference frame based at least in part on the predicted non-zero motion vector. *See, e.g.*, *See limitation 23[c].*
47. An encoder according to claim 10, wherein the motion estimation block further arranged to derive the predicted non-zero motion vector based at least in part on the motion vector of the second	The below references, as evidence by the example citations, disclose that the motion estimation block further arranged to derive the predicted non-zero motion vector based at least in part on the motion vector of the second segment. *See claim 28.* *See, e.g.*, The '808 patent, 4:44-60: In order to illustrate the operation of a generic video coding system in greater detail, reference

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
segment.	will now be made to the exemplary video encoder and video decoder illustrated in FIGS. 1 and 2 of the accompanying drawings. The video encoder 100 of FIG. 1 employs a combination of INTRA- and INTER-coding to produce a compressed (encoded) video bit-stream and decoder 200 of FIG. 2 is arranged to receive and decode the video bit-stream produced by encoder 100 in order to produce a reconstructed video sequence. Throughout the following description it will be assumed that the luminance component of a macroblock comprises 16×16 pixels arranged as an array of 4, 8×8 blocks, and that the associated chrominance components are spatially sub-sampled by a factor of two in the horizontal and vertical directions to form 8×8 blocks, as depicted in FIG. 3. Extension of the description to other block sizes and other sub-sampling schemes will be apparent to those of ordinary skill in the art. The ’808 patent, 3:61-4:12 The video encoder 100 comprises an input 101 for receiving a digital video signal from a camera or other video source (not shown). It also comprises a transformation unit 104 which is arranged to perform a block-based discrete cosine transform (DCT), a quantizer 106, an inverse quantizer 108, an inverse transformation unit 110, arranged to perform an inverse block-based discrete cosine transform (IDCT), combiners 112 and 116, and a frame store 120. The encoder further comprises a motion estimator 130, a motion field coder 140 and a motion compensated predictor 150. Switches 102 and 114 are operated co-operatively by control manager 160 to switch the encoder between an INTRA-mode of video encoding and an INTER-mode of video encoding. The encoder 100 also comprises a video multiplex coder 170 which forms a single bit-stream from the various types of information produced by the encoder 100 for further transmission to a remote receiving terminal or, for example, for storage on a mass storage medium, such as a computer hard drive (not shown). The ’808 patent, 7:30-8:18: The first step in forming a prediction for a macroblock of the current frame is performed by motion estimation block 130. The motion estimation block 130 receives the blocks of

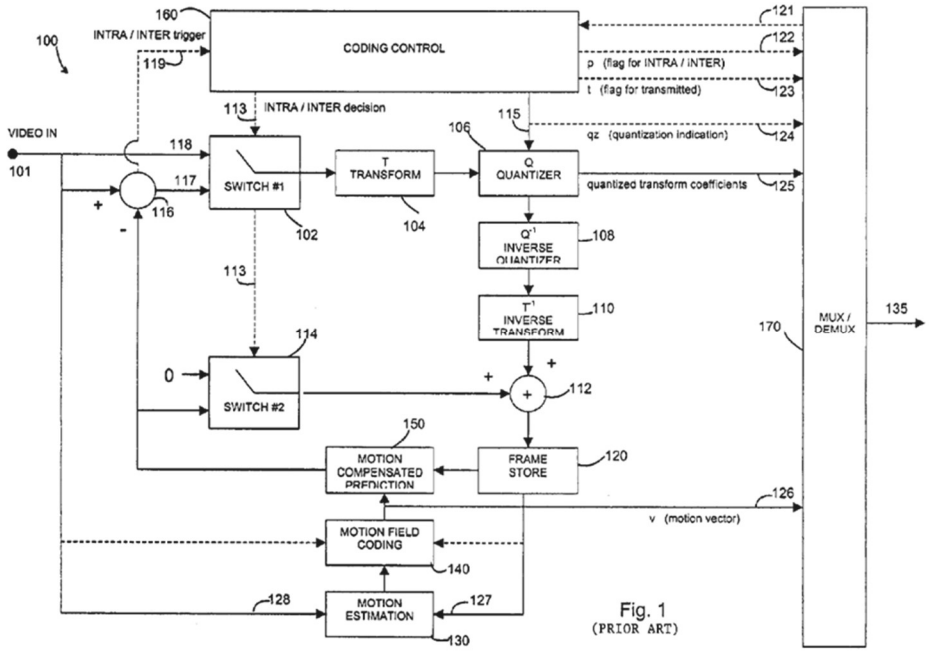
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	luminance and chrominance values which make up the current macroblock of the frame to be coded via line 128. It then performs a block matching operation in order to identify a region in the reference frame that corresponds best with the current macroblock. In order to perform the block matching operation, motion estimation block 130 accesses reference frame data stored in frame store 120 via line 127. More specifically, motion estimation block 130 performs block-matching by calculating difference values (e.g. sums of absolute differences) representing the difference in pixel values between the macroblock under examination and candidate best-matching regions of pixels from a reference frame stored in the frame store 120. A difference value is produced for candidate regions at all possible offsets within a predefined search region of the reference frame and motion estimation block 130 determines the smallest calculated difference value. The candidate region that yields the smallest difference value is selected as the best-matching region. The offset between the current macroblock and the best-matching region identified in the reference frame defines a "motion vector" for the macroblock in question. The motion vector typically comprises a pair of numbers, one describing the horizontal (Δx) between the current macroblock and the best-matching region of the reference frame, the other representing the vertical displacement (Δy). Once the motion estimation block 130 has produced a motion vector for the macroblock, it outputs the motion vector to the motion field coding block 140. The motion field coding block 140 approximates the motion vector received from motion estimation block 130 using a motion model comprising a set of basis functions and motion coefficients. More specifically, the motion field coding block 140 represents the motion vector as a set of motion coefficient values which, when multiplied by the basis functions, form an approximation of the motion vector. Typically, a translational motion model having only two motion coefficients and basis functions is used, but motion models of greater complexity may also be used. The motion coefficients are passed from motion field coding block 140 to motion compensated prediction block 150. Motion compensated prediction block 150 also receives the best-matching region of pixel values identified by motion estimation block 130 from frame store

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	120. Using the approximate representation of the motion vector generated by motion field coding block 140 and the pixel values of the best-matching region of pixels from the reference frame, motion compensated prediction block 150 generates an array of predicted pixel values for each block of the current macroblock. Each block of predicted pixel values is passed to combiner 116 where the predicted pixel values are subtracted from the actual (input) pixel values in the corresponding block of the current macroblock. In this way a set of prediction error blocks for the macroblock is obtained. The '808 patent, 16:1-14: FIG. 6 is a schematic block diagram of a video encoder 600 implemented according to an embodiment of the invention. When encoding frames of a digital video sequence, encoder 600 operates in a manner similar to that previously described in connection with the prior art video encoder of FIG. 1 to generate INTRA-coded and INTER-coded compressed video frames. The structure of the video encoder shown in FIG. 6 is substantially identical to that of the prior art video encoder shown in FIG. 1, with appropriate modifications to the motion estimation part necessary to implement the video encoding method according to the invention. All parts of the video encoder which implement functions and operate in a manner identical to the previously described prior art video encoder are identified with identical reference numbers. The '808 patent, FIG. 1:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	 Fig. 1 (PRIOR ART)
48. An encoder according to claim 10, wherein the motion estimation block further arranged to derive	The below references, as evidence by the example citations, disclose that the motion estimation block further arranged to derive the predicted non-zero motion vector based at least in part on the motion vector of the second segment and motion vector of a third segment neighboring the first segment.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
the predicted non-zero motion vector based at least in part on the motion vector of the second segment and motion vector of a third segment neighboring the first segment.	*See claim 29.* *See, e.g.*, The '808 patent, 4:44-60: In order to illustrate the operation of a generic video coding system in greater detail, reference will now be made to the exemplary video encoder and video decoder illustrated in FIGS. 1 and 2 of the accompanying drawings. The video encoder 100 of FIG. 1 employs a combination of INTRA- and INTER-coding to produce a compressed (encoded) video bit-stream and decoder 200 of FIG. 2 is arranged to receive and decode the video bit-stream produced by encoder 100 in order to produce a reconstructed video sequence. Throughout the following description it will be assumed that the luminance component of a macroblock comprises 16×16 pixels arranged as an array of 4, 8×8 blocks, and that the associated chrominance components are spatially sub-sampled by a factor of two in the horizontal and vertical directions to form 8×8 blocks, as depicted in FIG. 3. Extension of the description to other block sizes and other sub-sampling schemes will be apparent to those of ordinary skill in the art. The '808 patent, 3:61-4:12 The video encoder 100 comprises an input 101 for receiving a digital video signal from a camera or other video source (not shown). It also comprises a transformation unit 104 which is arranged to perform a block-based discrete cosine transform (DCT), a quantizer 106, an inverse quantizer 108, an inverse transformation unit 110, arranged to perform an inverse block-based discrete cosine transform (IDCT), combiners 112 and 116, and a frame store 120. The encoder further comprises a motion estimator 130, a motion field coder 140 and a motion compensated predictor 150. Switches 102 and 114 are operated co-operatively by control manager 160 to switch the encoder between an INTRA-mode of video encoding and an INTER-mode of video encoding. The encoder 100 also comprises a video multiplex coder 170 which forms a single bit-stream from the various types of information produced by the encoder 100 for further

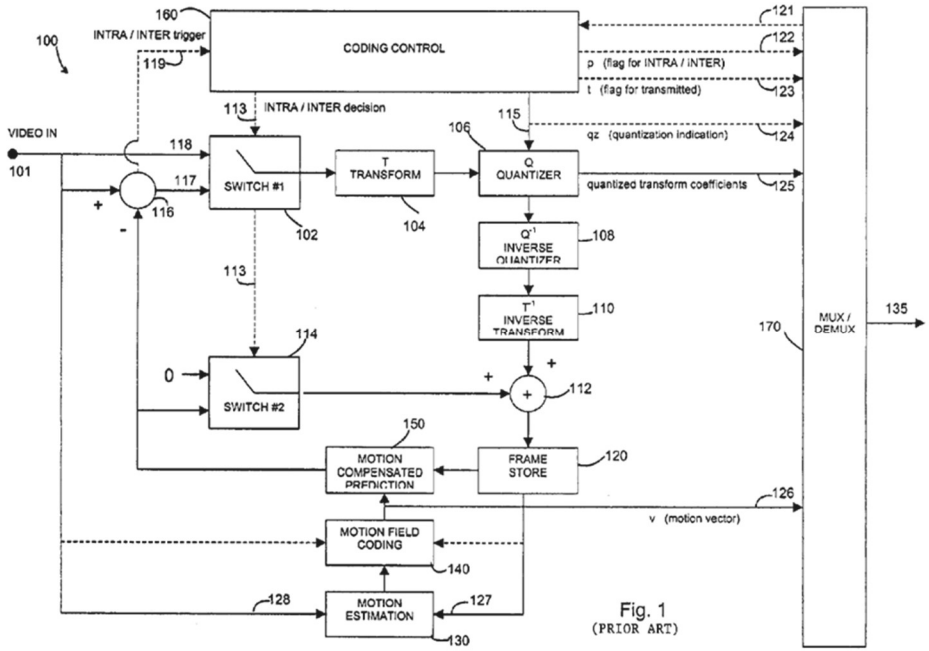
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	transmission to a remote receiving terminal or, for example, for storage on a mass storage medium, such as a computer hard drive (not shown). The '808 patent, 7:30-8:18: The first step in forming a prediction for a macroblock of the current frame is performed by motion estimation block 130. The motion estimation block 130 receives the blocks of luminance and chrominance values which make up the current macroblock of the frame to be coded via line 128. It then performs a block matching operation in order to identify a region in the reference frame that corresponds best with the current macroblock. In order to perform the block matching operation, motion estimation block 130 accesses reference frame data stored in frame store 120 via line 127. More specifically, motion estimation block 130 performs block-matching by calculating difference values (e.g. sums of absolute differences) representing the difference in pixel values between the macroblock under examination and candidate best-matching regions of pixels from a reference frame stored in the frame store 120. A difference value is produced for candidate regions at all possible offsets within a predefined search region of the reference frame and motion estimation block 130 determines the smallest calculated difference value. The candidate region that yields the smallest difference value is selected as the best-matching region. The offset between the current macroblock and the best-matching region identified in the reference frame defines a "motion vector" for the macroblock in question. The motion vector typically comprises a pair of numbers, one describing the horizontal (Δx) between the current macroblock and the best-matching region of the reference frame, the other representing the vertical displacement (Δy). Once the motion estimation block 130 has produced a motion vector for the macroblock, it outputs the motion vector to the motion field coding block 140. The motion field coding block 140 approximates the motion vector received from motion estimation block 130 using a motion model comprising a set of basis functions and motion coefficients. More specifically, the motion field coding block 140 represents the motion vector as a set of motion coefficient values

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	which, when multiplied by the basis functions, form an approximation of the motion vector. Typically, a translational motion model having only two motion coefficients and basis functions is used, but motion models of greater complexity may also be used. The motion coefficients are passed from motion field coding block 140 to motion compensated prediction block 150. Motion compensated prediction block 150 also receives the best-matching region of pixel values identified by motion estimation block 130 from frame store 120. Using the approximate representation of the motion vector generated by motion field coding block 140 and the pixel values of the best-matching region of pixels from the reference frame, motion compensated prediction block 150 generates an array of predicted pixel values for each block of the current macroblock. Each block of predicted pixel values is passed to combiner 116 where the predicted pixel values are subtracted from the actual (input) pixel values in the corresponding block of the current macroblock. In this way a set of prediction error blocks for the macroblock is obtained. The ’808 patent, 16:1-14: FIG. 6 is a schematic block diagram of a video encoder 600 implemented according to an embodiment of the invention. When encoding frames of a digital video sequence, encoder 600 operates in a manner similar to that previously described in connection with the prior art video encoder of FIG. 1 to generate INTRA-coded and INTER-coded compressed video frames. The structure of the video encoder shown in FIG. 6 is substantially identical to that of the prior art video encoder shown in FIG. 1, with appropriate modifications to the motion estimation part necessary to implement the video encoding method according to the invention. All parts of the video encoder which implement functions and operate in a manner identical to the previously described prior art video encoder are identified with identical reference numbers. The ’808 patent, FIG. 1:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	 Fig. 1 (PRIOR ART)
49. An encoder according to claim 10, wherein no residual information is provided for the first segment in the encoded bitstream.	The below references, as evidence by the example citations, disclose that no residual information is provided for the first segment in the encoded bitstream. *See claim 30.*

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	See, e.g., The '808 patent, 4:44-60: > In order to illustrate the operation of a generic video coding system in greater detail, reference will now be made to the exemplary video encoder and video decoder illustrated in FIGS. 1 and 2 of the accompanying drawings. The video encoder 100 of FIG. 1 employs a combination of INTRA- and INTER-coding to produce a compressed (encoded) video bit-stream and decoder 200 of FIG. 2 is arranged to receive and decode the video bit-stream produced by encoder 100 in order to produce a reconstructed video sequence. Throughout the following description it will be assumed that the luminance component of a macroblock comprises 16×16 pixels arranged as an array of 4, 8×8 blocks, and that the associated chrominance components are spatially sub-sampled by a factor of two in the horizontal and vertical directions to form 8×8 blocks, as depicted in FIG. 3. Extension of the description to other block sizes and other sub-sampling schemes will be apparent to those of ordinary skill in the art. The '808 patent, 3:61-4:12 > The video encoder 100 comprises an input 101 for receiving a digital video signal from a camera or other video source (not shown). It also comprises a transformation unit 104 which is arranged to perform a block-based discrete cosine transform (DCT), a quantizer 106, an inverse quantizer 108, an inverse transformation unit 110, arranged to perform an inverse block-based discrete cosine transform (IDCT), combiners 112 and 116, and a frame store 120. The encoder further comprises a motion estimator 130, a motion field coder 140 and a motion compensated predictor 150. Switches 102 and 114 are operated co-operatively by control manager 160 to switch the encoder between an INTRA-mode of video encoding and an INTER-mode of video encoding. The encoder 100 also comprises a video multiplex coder 170 which forms a single bit-stream from the various types of information produced by the encoder 100 for further transmission to a remote receiving terminal or, for example, for storage on a mass storage

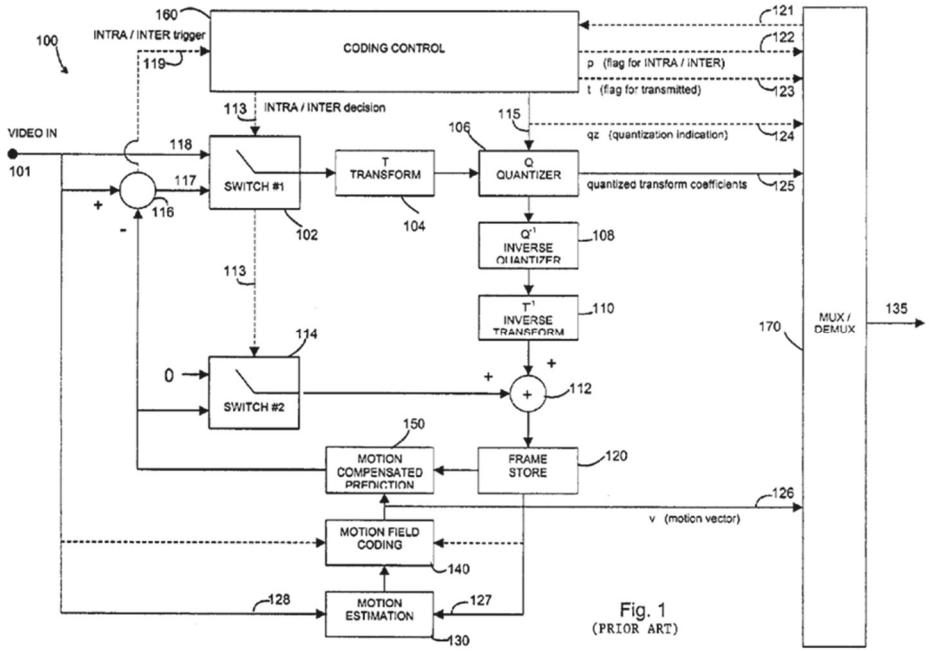
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	medium, such as a computer hard drive (not shown). The ’808 patent, 7:30-8:18: The first step in forming a prediction for a macroblock of the current frame is performed by motion estimation block 130. The motion estimation block 130 receives the blocks of luminance and chrominance values which make up the current macroblock of the frame to be coded via line 128. It then performs a block matching operation in order to identify a region in the reference frame that corresponds best with the current macroblock. In order to perform the block matching operation, motion estimation block 130 accesses reference frame data stored in frame store 120 via line 127. More specifically, motion estimation block 130 performs block-matching by calculating difference values (e.g. sums of absolute differences) representing the difference in pixel values between the macroblock under examination and candidate best-matching regions of pixels from a reference frame stored in the frame store 120. A difference value is produced for candidate regions at all possible offsets within a predefined search region of the reference frame and motion estimation block 130 determines the smallest calculated difference value. The candidate region that yields the smallest difference value is selected as the best-matching region. The offset between the current macroblock and the best-matching region identified in the reference frame defines a “motion vector” for the macroblock in question. The motion vector typically comprises a pair of numbers, one describing the horizontal (Δx) between the current macroblock and the best-matching region of the reference frame, the other representing the vertical displacement (Δy). Once the motion estimation block 130 has produced a motion vector for the macroblock, it outputs the motion vector to the motion field coding block 140. The motion field coding block 140 approximates the motion vector received from motion estimation block 130 using a motion model comprising a set of basis functions and motion coefficients. More specifically, the motion field coding block 140 represents the motion vector as a set of motion coefficient values which, when multiplied by the basis functions, form an approximation of the motion vector.

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	Typically, a translational motion model having only two motion coefficients and basis functions is used, but motion models of greater complexity may also be used. The motion coefficients are passed from motion field coding block 140 to motion compensated prediction block 150. Motion compensated prediction block 150 also receives the best-matching region of pixel values identified by motion estimation block 130 from frame store 120. Using the approximate representation of the motion vector generated by motion field coding block 140 and the pixel values of the best-matching region of pixels from the reference frame, motion compensated prediction block 150 generates an array of predicted pixel values for each block of the current macroblock. Each block of predicted pixel values is passed to combiner 116 where the predicted pixel values are subtracted from the actual (input) pixel values in the corresponding block of the current macroblock. In this way a set of prediction error blocks for the macroblock is obtained. The '808 patent, 16:1-14: FIG. 6 is a schematic block diagram of a video encoder 600 implemented according to an embodiment of the invention. When encoding frames of a digital video sequence, encoder 600 operates in a manner similar to that previously described in connection with the prior art video encoder of FIG. 1 to generate INTRA-coded and INTER-coded compressed video frames. The structure of the video encoder shown in FIG. 6 is substantially identical to that of the prior art video encoder shown in FIG. 1, with appropriate modifications to the motion estimation part necessary to implement the video encoding method according to the invention. All parts of the video encoder which implement functions and operate in a manner identical to the previously described prior art video encoder are identified with identical reference numbers. The '808 patent, FIG. 1:

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	 Fig. 1 (PRIOR ART)
51. An encoder according to claim 10, wherein if the second segment has a zero motion vector, the zero motion vector is assigned to the skip coding mode of the first segment	The below references, as evidence by the example citations, disclose that if the second segment has a zero motion vector, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector. *See, e.g.*,

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector.	*See claim 6.*
52. An encoder according to claim 10, wherein if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from the reference picture, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the	The below references, as evidence by the example citations, disclose if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from the reference picture, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector. *See, e.g.*, *See claim 24.*

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
zero motion vector.	
53. An encoder according to claim 10, wherein if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from a second reference picture immediately preceding the picture second segment belongs to, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector.	The below references, as evidence by the example citations, disclose if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from a second reference picture immediately preceding the picture second segment belongs to, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector. *See, e.g.*, *See claim 25.*

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
54. A decoder according to claim 16, wherein if the second segment has a zero motion vector, the zero-motion vector is assigned to the skip coding mode for the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector.	The below references, as evidence by the example citations, disclose that if the second segment has a zero motion vector, the zero-motion vector is assigned to the skip coding mode for the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector. *See claim 6.* *See, e.g.*, Sugahara, 7:2-15. The method can be implemented such that each of the pictures for which prediction information is replaced is a B-picture, and the copy data set includes motion vector information indicating that an overall amount of picture motion of a B-picture with respect to a corresponding temporally preceding or succeeding reference picture is zero, and motion compensated prediction error information indicating that respective amounts of motion compensated prediction error for all macroblocks of the B-picture are zero. That is to say, all macroblocks of the B-picture are indicated as being skipped macroblocks, so that at the time of decoding the MPEG data stream, that B-picture will be decoded as an identical copy of a corresponding reference picture. Sugahara, 21:50-67. wherein said stream is an MPEG compressed video data stream in which each of said reference pictures is an I-picture or a P-picture and each of said predictively encoded pictures is a P-picture or a B-picture, each of said pictures for which prediction information is replaced is a B-picture, and wherein said copy data set includes motion vector information indicating that an overall amount of picture motion of a B-picture with respect to a corresponding temporally

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	preceding reference picture or with respect to a corresponding temporally succeeding reference picture is zero and motion compensated prediction error information indicating that respective amounts of motion compensated prediction error for all macroblocks of said B-picture are zero, to thereby specify all macroblocks of said B-picture as being skipped macroblocks.
58. A decoder according to claim 16, wherein the motion estimation block further arranged to derive the predicted non-zero motion vector based at least in part on the motion vector of the second segment.	The below references, as evidence by the example citations, disclose that the motion estimation block further arranged to derive the predicted non-zero motion vector based at least in part on the motion vector of the second segment. *See claim 28.* *See, e.g.*, The '808 patent, 4:44-60: In order to illustrate the operation of a generic video coding system in greater detail, reference will now be made to the exemplary video encoder and video decoder illustrated in FIGS. 1 and 2 of the accompanying drawings. The video encoder 100 of FIG. 1 employs a combination of INTRA- and INTER-coding to produce a compressed (encoded) video bit-stream and decoder 200 of FIG. 2 is arranged to receive and decode the video bit-stream produced by encoder 100 in order to produce a reconstructed video sequence. Throughout the following description it will be assumed that the luminance component of a macroblock comprises 16×16 pixels arranged as an array of 4, 8×8 blocks, and that the associated chrominance components are spatially sub-sampled by a factor of two in the horizontal and vertical directions to form 8×8 blocks, as depicted in FIG. 3. Extension of the description to other block sizes and other sub-sampling schemes will be apparent to those of ordinary skill in the art. The '808 patent, 3:61-4:12

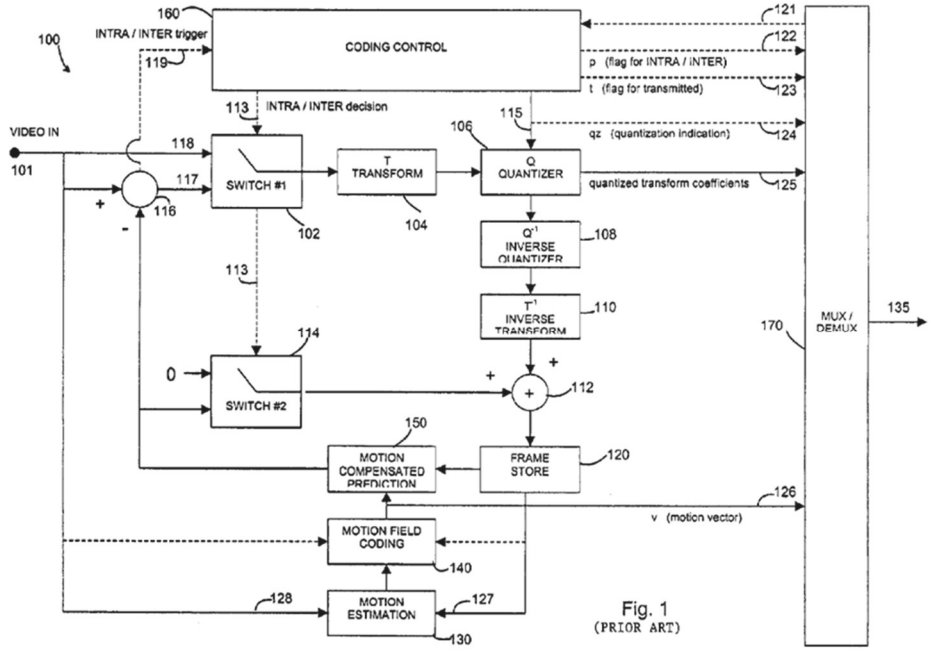
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	The video encoder 100 comprises an input 101 for receiving a digital video signal from a camera or other video source (not shown). It also comprises a transformation unit 104 which is arranged to perform a block-based discrete cosine transform (DCT), a quantizer 106, an inverse quantizer 108, an inverse transformation unit 110, arranged to perform an inverse block-based discrete cosine transform (IDCT), combiners 112 and 116, and a frame store 120. The encoder further comprises a motion estimator 130, a motion field coder 140 and a motion compensated predictor 150. Switches 102 and 114 are operated co-operatively by control manager 160 to switch the encoder between an INTRA-mode of video encoding and an INTER-mode of video encoding. The encoder 100 also comprises a video multiplex coder 170 which forms a single bit-stream from the various types of information produced by the encoder 100 for further transmission to a remote receiving terminal or, for example, for storage on a mass storage medium, such as a computer hard drive (not shown). The '808 patent, 7:30-8:18: The first step in forming a prediction for a macroblock of the current frame is performed by motion estimation block 130. The motion estimation block 130 receives the blocks of luminance and chrominance values which make up the current macroblock of the frame to be coded via line 128. It then performs a block matching operation in order to identify a region in the reference frame that corresponds best with the current macroblock. In order to perform the block matching operation, motion estimation block 130 accesses reference frame data stored in frame store 120 via line 127. More specifically, motion estimation block 130 performs block-matching by calculating difference values (e.g. sums of absolute differences) representing the difference in pixel values between the macroblock under examination and candidate best-matching regions of pixels from a reference frame stored in the frame store 120. A difference value is produced for candidate regions at all possible offsets within a predefined search region of the reference frame and motion estimation block 130 determines the smallest calculated difference value. The candidate region that yields the smallest difference value is selected as the best-matching region. The offset between the current macroblock and the best-matching

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	region identified in the reference frame defines a "motion vector" for the macroblock in question. The motion vector typically comprises a pair of numbers, one describing the horizontal (Δx) between the current macroblock and the best-matching region of the reference frame, the other representing the vertical displacement (Δy). Once the motion estimation block 130 has produced a motion vector for the macroblock, it outputs the motion vector to the motion field coding block 140. The motion field coding block 140 approximates the motion vector received from motion estimation block 130 using a motion model comprising a set of basis functions and motion coefficients. More specifically, the motion field coding block 140 represents the motion vector as a set of motion coefficient values which, when multiplied by the basis functions, form an approximation of the motion vector. Typically, a translational motion model having only two motion coefficients and basis functions is used, but motion models of greater complexity may also be used. The motion coefficients are passed from motion field coding block 140 to motion compensated prediction block 150. Motion compensated prediction block 150 also receives the best-matching region of pixel values identified by motion estimation block 130 from frame store 120. Using the approximate representation of the motion vector generated by motion field coding block 140 and the pixel values of the best-matching region of pixels from the reference frame, motion compensated prediction block 150 generates an array of predicted pixel values for each block of the current macroblock. Each block of predicted pixel values is passed to combiner 116 where the predicted pixel values are subtracted from the actual (input) pixel values in the corresponding block of the current macroblock. In this way a set of prediction error blocks for the macroblock is obtained. The '808 patent, 16:1-14: FIG. 6 is a schematic block diagram of a video encoder 600 implemented according to an embodiment of the invention. When encoding frames of a digital video sequence, encoder 600

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	operates in a manner similar to that previously described in connection with the prior art video encoder of FIG. 1 to generate INTRA-coded and INTER-coded compressed video frames. The structure of the video encoder shown in FIG. 6 is substantially identical to that of the prior art video encoder shown in FIG. 1, with appropriate modifications to the motion estimation part necessary to implement the video encoding method according to the invention. All parts of the video encoder which implement functions and operate in a manner identical to the previously described prior art video encoder are identified with identical reference numbers. The '808 patent, FIG. 1:  Fig. 1 (PRIOR ART)

ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
59. A decoder according to claim 16, wherein the motion estimation block further arranged to derive the predicted non-zero motion vector based at least in part on the motion vector of the second segment and motion vector of a third segment neighboring the first segment.	The below references, as evidence by the example citations, disclose that the motion estimation block further arranged to derive the predicted non-zero motion vector based at least in part on the motion vector of the second segment and motion vector of a third segment neighboring the first segment. *See claim 29.* *See, e.g.*, The '808 patent, 4:44-60: In order to illustrate the operation of a generic video coding system in greater detail, reference will now be made to the exemplary video encoder and video decoder illustrated in FIGS. 1 and 2 of the accompanying drawings. The video encoder 100 of FIG. 1 employs a combination of INTRA- and INTER-coding to produce a compressed (encoded) video bit-stream and decoder 200 of FIG. 2 is arranged to receive and decode the video bit-stream produced by encoder 100 in order to produce a reconstructed video sequence. Throughout the following description it will be assumed that the luminance component of a macroblock comprises 16×16 pixels arranged as an array of 4, 8×8 blocks, and that the associated chrominance components are spatially sub-sampled by a factor of two in the horizontal and vertical directions to form 8×8 blocks, as depicted in FIG. 3. Extension of the description to other block sizes and other sub-sampling schemes will be apparent to those of ordinary skill in the art. The '808 patent, 3:61-4:12 The video encoder 100 comprises an input 101 for receiving a digital video signal from a camera or other video source (not shown). It also comprises a transformation unit 104 which is arranged to perform a block-based discrete cosine transform (DCT), a quantizer 106, an inverse quantizer 108, an inverse transformation unit 110, arranged to perform an inverse block-based discrete cosine transform (IDCT), combiners 112 and 116, and a frame store 120. The encoder

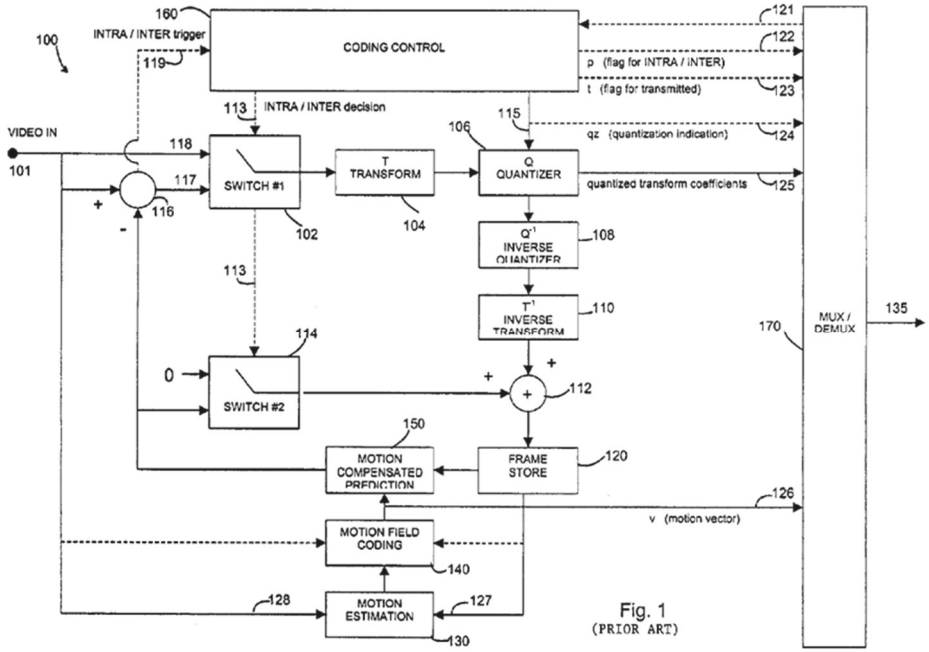
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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	further comprises a motion estimator 130, a motion field coder 140 and a motion compensated predictor 150. Switches 102 and 114 are operated co-operatively by control manager 160 to switch the encoder between an INTRA-mode of video encoding and an INTER-mode of video encoding. The encoder 100 also comprises a video multiplex coder 170 which forms a single bit-stream from the various types of information produced by the encoder 100 for further transmission to a remote receiving terminal or, for example, for storage on a mass storage medium, such as a computer hard drive (not shown). The '808 patent, 7:30-8:18: The first step in forming a prediction for a macroblock of the current frame is performed by motion estimation block 130. The motion estimation block 130 receives the blocks of luminance and chrominance values which make up the current macroblock of the frame to be coded via line 128. It then performs a block matching operation in order to identify a region in the reference frame that corresponds best with the current macroblock. In order to perform the block matching operation, motion estimation block 130 accesses reference frame data stored in frame store 120 via line 127. More specifically, motion estimation block 130 performs block-matching by calculating difference values (e.g. sums of absolute differences) representing the difference in pixel values between the macroblock under examination and candidate best-matching regions of pixels from a reference frame stored in the frame store 120. A difference value is produced for candidate regions at all possible offsets within a predefined search region of the reference frame and motion estimation block 130 determines the smallest calculated difference value. The candidate region that yields the smallest difference value is selected as the best-matching region. The offset between the current macroblock and the best-matching region identified in the reference frame defines a "motion vector" for the macroblock in question. The motion vector typically comprises a pair of numbers, one describing the horizontal (Δx) between the current macroblock and the best-matching region of the reference frame, the other representing the vertical displacement (Δy).

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	Once the motion estimation block 130 has produced a motion vector for the macroblock, it outputs the motion vector to the motion field coding block 140. The motion field coding block 140 approximates the motion vector received from motion estimation block 130 using a motion model comprising a set of basis functions and motion coefficients. More specifically, the motion field coding block 140 represents the motion vector as a set of motion coefficient values which, when multiplied by the basis functions, form an approximation of the motion vector. Typically, a translational motion model having only two motion coefficients and basis functions is used, but motion models of greater complexity may also be used. The motion coefficients are passed from motion field coding block 140 to motion compensated prediction block 150. Motion compensated prediction block 150 also receives the best-matching region of pixel values identified by motion estimation block 130 from frame store 120. Using the approximate representation of the motion vector generated by motion field coding block 140 and the pixel values of the best-matching region of pixels from the reference frame, motion compensated prediction block 150 generates an array of predicted pixel values for each block of the current macroblock. Each block of predicted pixel values is passed to combiner 116 where the predicted pixel values are subtracted from the actual (input) pixel values in the corresponding block of the current macroblock. In this way a set of prediction error blocks for the macroblock is obtained. The '808 patent, 16:1-14: FIG. 6 is a schematic block diagram of a video encoder 600 implemented according to an embodiment of the invention. When encoding frames of a digital video sequence, encoder 600 operates in a manner similar to that previously described in connection with the prior art video encoder of FIG. 1 to generate INTRA-coded and INTER-coded compressed video frames. The structure of the video encoder shown in FIG. 6 is substantially identical to that of the prior art video encoder shown in FIG. 1, with appropriate modifications to the motion estimation part necessary to implement the video encoding method according to the invention. All parts of the

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	video encoder which implement functions and operate in a manner identical to the previously described prior art video encoder are identified with identical reference numbers. The '808 patent, FIG. 1:  Fig. 1 (PRIOR ART)

ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
60. A decoder according to claim 16, wherein no residual information is provided for the first segment in an encoded bitstream.	The below references, as evidence by the example citations, disclose that no residual information is provided for the first segment in an encoded bitstream. *See, e.g.*, *See claim 30.*
62. A decoder according to claim 16, wherein if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from the reference picture, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the	The below references, as evidence by the example citations, disclose that if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from the reference picture, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector. *See, e.g.*, *See claim 24.*

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
zero motion vector.	
63. A decoder according to claim 16, wherein if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from a second reference picture immediately preceding the picture second segment belongs to, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector.	The below references, as evidence by the example citations, disclose that if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from a second reference picture immediately preceding the picture second segment belongs to, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector. *See, e.g.*, *See claim 25.*

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
64. A decoder according to claim 16, wherein no further motion vector information for the first segment is retrieved from an encoded bitstream.	The below references, as evidence by the example citations, disclose that no further motion vector information for the first segment is retrieved from an encoded bitstream. *See, e.g.*, Sugahara, 7:2-15. > The method can be implemented such that each of the pictures for which prediction information is replaced is a B-picture, and the copy data set includes motion vector information indicating that an overall amount of picture motion of a B-picture with respect to a corresponding temporally preceding or succeeding reference picture is zero, and motion compensated prediction error information indicating that respective amounts of motion compensated prediction error for all macroblocks of the B-picture are zero. That is to say, all macroblocks of the B-picture are indicated as being skipped macroblocks, so that at the time of decoding the MPEG data stream, that B-picture will be decoded as an identical copy of a corresponding reference picture. Sugahara, 21:50-67. > wherein said stream is an MPEG compressed video data stream in which each of said reference pictures is an I-picture or a P-picture and each of said predictively encoded pictures is a P-picture or a B-picture, each of said pictures for which prediction information is replaced is a B-picture, and wherein said copy data set includes motion vector information indicating that an overall amount of picture motion of a B-picture with respect to a corresponding temporally preceding reference picture or with respect to a corresponding temporally succeeding reference picture is zero and motion compensated prediction error information indicating that respective amounts of motion compensated prediction error for all macroblocks of said B-picture are zero,

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ASSERTED CLAIMS	PRIOR ART DISCLOSURES:
	to thereby specify all macroblocks of said B-picture as being skipped macroblocks.
65. A method according to claim 7, wherein no further motion vector information for the first segment is retrieved from the encoded bitstream.	The below references, as evidence by the example citations, disclose that no further motion vector information for the first segment is retrieved from the encoded bitstream. *See, e.g.*, *See claim 64.*

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