

TO: Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been
filed in the U.S. District Court Eastern District of Texas, Texarkana Division on the following

☐ Trademarks or ☒ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO. 5:23-CV-00152	DATE FILED 12/29/2023	U.S. DISTRICT COURT Eastern District of Texas, Texarkana Division
PLAINTIFF MAXELL, LTD.		DEFENDANT LG ELECTRONICS INC., and LG ELECTRONICS U.S.A., INC.
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 6,856,760	2/15/2005	Maxell, Ltd.
2 6,973,334	12/6/2005	Maxell, Ltd.
3 7,199,821	4/3/2007	Maxell, Ltd.
4 10,244,284	3/26/2019	Maxell, Ltd.
5 8,339,493	12/25/2012	Maxell, Ltd.

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading		
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK	
1			
2			
3			
4			
5			

In the above --entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE
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Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

OLYMPUS CORPORATION, OLYMPUS CORPORATION OF THE
AMERICAS, and OLYMPUS AMERICA INC.,
Petitioner,

v.

MAXELL, LTD.,
Patent Owner.

Case IPR2018-00905
Patent 6,856,760 B2

Before LYNNE E. PETTIGREW, MINN CHUNG, and
TERRENCE W. McMILLIN, *Administrative Patent Judges*.

PETTIGREW, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314(a)

I. INTRODUCTION

Olympus Corporation, Olympus Corporation of the Americas, and Olympus America Inc. (collectively, “Petitioner”) filed a Petition for *inter partes* review of claims 1–15 of U.S. Patent No. 6,856,760 B2 (Ex. 1001, “the ’760 patent”). Paper 2 (“Pet.”). Maxell, Ltd. (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”). Petitioner filed an authorized Reply to the Preliminary Response. Paper 8 (“Pet. Reply to Prelim. Resp.”).

Institution of an *inter partes* review is authorized when “the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a). After considering the evidence and arguments presented in the Petition and Preliminary Response,¹ we conclude that the information presented does not show there is a reasonable likelihood that Petitioner would prevail in establishing the unpatentability of any challenged claim of the ’760 patent. For the reasons explained below, we decline to institute an *inter partes* review of claims 1–15 of the ’760 patent.

¹ We have not considered Petitioner’s Reply to the Preliminary Response, which addresses only Patent Owner’s argument that we should exercise our discretion to deny the Petition under 35 U.S.C. § 325(d) because the same prior art and substantially the same arguments as those presented in the Petition were previously presented during prosecution of the ’760 patent. *See* Prelim. Resp. 14–29; Pet. Reply to Prelim. Resp. 1. We do not reach that issue because we deny the Petition on other grounds.

A. Related Matters

The parties indicate that the '760 patent has been asserted in the following district court action: *Maxell, Ltd. v. Huawei Device USA Inc. et al.*, Case No. 5:16-cv-00178-RWS (E.D. Tex.). Pet. 2; Paper 5, 1 (Patent Owner's Mandatory Notices).

B. The '760 Patent

The '760 patent generally relates to recording and reproducing still and moving pictures to and from a recording medium. Ex. 1001, 1:11-14. In one embodiment, the '760 patent describes a digital camera that records still images using two different recording methods and records thumbnail images to be used when searching images on a display device. *Id.* at 8:31-9:12, 9:33-50.

Figure 3 of the '760 patent is reproduced below:

FIG. 3

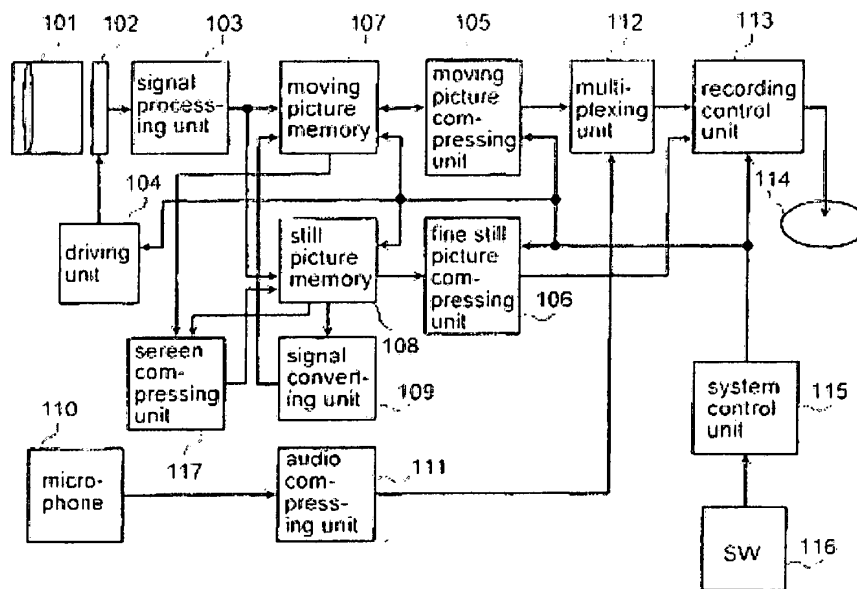


Figure 3 is a system block diagram of a camera disclosed in the '760 patent. *Id.* at 5:41–43. The camera includes moving picture compressing unit 105 for compressing video² signals in accordance with a moving picture encoding standard such as MPEG (Moving Picture Experts Group). *Id.* at 8:42–45. The camera also includes fine still picture compressing unit 106 for compressing video signals in accordance with a fine still picture encoding standard such as JPEG (Joint Photographic Experts Group). *Id.* at 8:45–48. Moving picture memory 107 and still picture memory 108 store picture data temporarily during compressing operations. *Id.* at 8:48–57.

When still picture photographing is selected by switch 116, fine still picture compressing unit 106 generates still picture file data that are recorded on recording medium 114. *Id.* at 9:33–36. Signal converting unit 109 converts fine still picture signals to the same signal format as that of single frame moving picture signals and stores them in moving picture memory 107. *Id.* at 8:53–56. Then moving picture compressing unit 105 compresses the signals to MPEG I still pictures using an MPEG encoding process and stores them on recording medium 114. *Id.* at 7:7–10, 9:36–39. This method allows still pictures to be reproduced on a player typically used to reproduce MPEG-encoded moving images, so that only one device is needed to decode both moving and still images. *Id.* at 7:12–17. According to the '760 patent, converting JPEG fine still pictures using an MPEG encoding process as described results in higher resolution MPEG pictures

² In the '760 patent, the term “video” encompasses both moving and still pictures. *See* Ex. 1001, 2:50–51 (referring to “a video recording apparatus that can record both moving and still pictures on a recording medium”).

than conventional techniques that encode moving pictures as still pictures in an MPEG I format. *See id.* at 1:33–61, 2:19–29.

The camera in Figure 3 also includes screen compressing unit 117, which creates thumbnail pictures by compressing still pictures stored in still picture memory 108 to a smaller screen size and storing them again in still picture memory 108. *Id.* at 9:9–12, 9:39–45. After that, fine still picture processing unit 106 compresses the thumbnail pictures stored in still picture memory 108 and records the thumbnail file data on recording medium 114. *Id.* at 9:45–50. Thus, in this embodiment, a still picture encoded by first and second encoding methods (e.g., JPEG and MPEG) and a corresponding thumbnail picture are stored on the recording medium.

Figure 5 of the '760 patent is reproduced below:

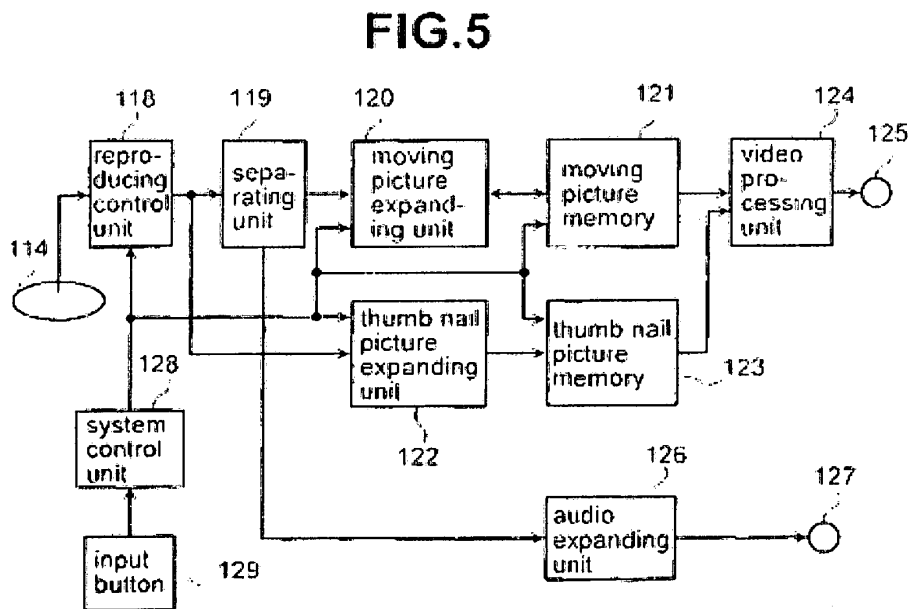


Figure 5 is a system block diagram of a video reproducing apparatus in accordance with an embodiment described in the '760 patent. *Id.* at 5:46–47. The reproducing apparatus includes, among other elements, moving picture expanding unit 120 and thumbnail picture expanding unit 122, which, via reproducing control unit 118, obtain picture data files from recording medium 114. *Id.* at 11:34–46. Video processing unit 124 converts expanded pictures to video signals. *Id.* at 11:34–36. System control unit 128 controls the system to display a list of thumbnail pictures via video processing unit 124, video output terminal 125, and an external display. *Id.* at 12:7–18. The user selects a thumbnail, and a data file corresponding to the selected thumbnail is selected from two types of still picture data files (e.g., MPEG moving picture format or JPEG fine still picture format) and provided to the output terminal. *Id.* at 12:36–67.

C. Illustrative Claims

Petitioner challenges all claims (i.e., claims 1–15) of the '760 patent. Claims 1, 4, 7, 10, and 13 are independent. Claims 1 and 4 are illustrative of the claimed subject matter:

1. A machine-readable recording medium comprising:
a first still picture recorded thereon encoded by a first encoding method[], wherein the first still picture having descriptive information associated therewith to allow a machine to recognize and decode the first still picture for display;
a second still picture recorded thereon encoded by a second encoding method, wherein the second still picture having descriptive information associated therewith to allow the machine to recognize and decode the second still picture for display, wherein the second encoding method is different from the first encoding method; and

a picture recorded thereon corresponding to said first and second still pictures, which has a smaller number of pixels than said first and second still pictures, wherein the picture having descriptive information associated therewith to allow the machine to recognize and decode the picture for display;

wherein said first still picture, said second still picture and said picture are related pictures derived from common signal data.

4. A video reproducing method, comprising:

reproducing at least a first still picture, a second still picture and a picture from a recording medium, wherein said first still picture is encoded by a first encoding method, said second still picture is encoded by a second encoding method different from the first encoding method, and said picture corresponds to said first and second still pictures and has a smaller number of pixels than said first and second still pictures, and wherein said first still picture, said second still picture and said picture are related pictures derived from common signal data;

outputting a plurality of pictures from the reproducing operation; and

outputting said first still picture corresponding to a selected picture.

Ex. 1001, 14:43–64, 15:7–23.

D. Asserted Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability against the challenged claims of the '760 patent (Pet. 6):

Reference(s)	Basis	Challenged Claim(s)
Ishikawa ³	§ 102(b) ⁴	1
Ishikawa	§ 103(a)	2 and 3
Takaichi ⁵ and Ishikawa	§ 103(a)	4–15

Petitioner also relies on the Declaration of Dr. Majid Rabbani (Ex. 1006).

II. DISCUSSION

A. Claim Construction

In an *inter partes* review, we construe claim terms in an unexpired patent according to their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b) (2017); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard).

³ Japanese Laid Open Patent Application No. 10-108133, published Apr. 24, 1998 (Ex. 1002, “Ishikawa,” which includes both the original Japanese language version and a certified English translation).

⁴ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. §§ 102 and 103. Because the '760 patent has an effective filing date before the effective date of the applicable AIA amendments, we refer to the pre-AIA version of §§ 102 and 103.

⁵ Japanese Laid Open Patent Application No. 10-164483, published June 19, 1998 (Ex. 1004, “Takaichi,” which includes both the original Japanese language version and a certified English translation).

Consistent with the broadest reasonable construction, claim terms are presumed to have their ordinary and customary meaning as understood by a person of ordinary skill in the art in the context of the entire patent disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Although Petitioner asserts that the '760 patent will expire on September 20, 2019, neither party requested a district court-type claim construction by filing a motion pursuant to 37 C.F.R. § 42.100(b) and certifying that the '760 patent will expire within eighteen months from the Notice of Filing Date Accorded to Petition in this case. *See* Pet. 17. Accordingly, we apply the broadest reasonable construction for purposes of this decision.

Petitioner contends that several claim terms in independent claims 10 and 13 containing the word “means” should be construed under 35 U.S.C. § 112, sixth paragraph,⁶ and proposes specific constructions for those terms. Pet. 18–23. Petitioner further contends that, for purposes of this decision, all other terms should be afforded their ordinary and customary meaning. *Id.* at 17. With one exception not relevant to this decision, Patent Owner does not contest Petitioner’s proposed constructions, nor does Patent Owner propose any claim constructions of its own. Prelim. Resp. 10–11.

For purposes of this decision, we determine that none of the terms construed by the parties require express construction. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed.

⁶ The AIA re-designated 35 U.S.C. § 112, sixth paragraph, as § 112(f). Because the '760 patent has an effective filing date before the effective date of the applicable AIA amendments, we refer to the pre-AIA version of § 112.

Cir. 2017) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)) (holding that only claim terms in controversy need to be construed, and only to the extent necessary to resolve the controversy). To the extent it is necessary for us to construe any other claim language, we do so below in the context of analyzing whether the information presented shows a reasonable likelihood that Petitioner would prevail in establishing the unpatentability of the challenged claims.

B. Relevant Principles of Law

In order to anticipate a claim, a prior art reference must show all of the limitations of the claim arranged or combined in the same way as recited in the claim. *Net MoneyIN, Inc. v. Verisign, Inc.*, 545 F.3d 1359, 1370 (Fed. Cir. 2008). A claim is unpatentable under § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art;⁷ and (4) when in evidence, objective indicia of

⁷ Relying on the testimony of Dr. Rabbani, Petitioner offers an assessment of the level of ordinary skill in the art at the time of the invention of the '760 patent. Pet. 15–16 (citing Ex. 1006 ¶¶ 46–47). Patent Owner does not offer an alternative assessment. To the extent necessary, and for purposes of this decision, we accept the assessment offered by Petitioner as it is consistent with the '760 patent and the asserted prior art.

non-obviousness (i.e., secondary considerations).⁸ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). “To satisfy its burden of proving obviousness, a petitioner cannot employ mere conclusory statements. The petitioner must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

C. Overview of Asserted Prior Art References

1. Ishikawa

Ishikawa discloses an imaging device and control method “to allow photographed image data to be easily read and reproduced even by information processing devices that have different types of environments.” Ex. 1002 ¶ 8. The imaging device includes “an encoding means for performing a plurality of differing encoding processes for the image data . . . imaged by the imaging means.” *Id.* ¶ 9. The “plurality of encoded image data” are then stored “in a predetermined storage medium.” *Id.*

Ishikawa discloses a first embodiment directed to processing still images. *Id.* ¶¶ 10–34. In that embodiment, an image is captured, converted to a digital signal, and stored temporarily in an image memory. *Id.* ¶¶ 12–14. The image signal undergoes a first encoding process based on, for example, the JPEG format. *Id.* ¶¶ 15–16. The encoded image data are stored in a later-stage memory along with “an arbitrarily formatted header and footer” generated by the CPU and containing, for example, “information for date and time of photographing or the like.” *Id.* ¶ 17.

⁸ Neither party presents arguments or evidence of secondary considerations, which therefore do not constitute part of our analysis.

Next, a second encoding process is performed on the image signal data stored in the image memory. *Id.* ¶ 19. The second encoding generates a “small image, wherein the image size is thinned compared to the amount of data used in the first encoding process,” and converted to RGB format. *Id.* ¶¶ 19–20. This reduced size image, or thumbnail image, is stored in the later-stage memory with “a header and a footer for RGB signal data” generated by the CPU. *Id.* ¶ 20.

Ishikawa also discloses that “nth encoded data can be further generated using the same image signal by way of an nth encoding format such as one wherein only the compression ratio is changed during encoding, one wherein only the luminance information is encoded, and the like.” *Id.* ¶ 21. Ishikawa further explains that in this embodiment, “the first encoding and the second encoding were processed in order, but the order may be reversed, and three or more encodings may be performed in any order.” *Id.* ¶ 32.

2. Takaichi

Takaichi discloses an image data storage device that records still images or moving images and stores them on a recording medium. Ex. 1004 ¶¶ 8, 14. Takaichi further discloses compressing (i.e., encoding) still images and moving images in accordance with, for example, the JPEG and MPEG standards, respectively. *Id.* ¶ 22. To allow a user to find a desired image from a plurality of stored images, Takaichi also discloses recording low-resolution index image data, i.e., thumbnails, corresponding to the still or moving images. *Id.* ¶ 21. Index images are encoded using, for example, the JPEG standard. *Id.* In the preferred embodiment, the storage device is an image transmitter that transmits index images to an image receiver, allowing the user to select an image to be displayed, and then transmits the selected

still image or moving image. *Id.* ¶ 6, Fig. 1. Takaichi also states that the system can be implemented as a standalone camera containing both the image transmitter and image receiver. *Id.* ¶ 31.

D. Asserted Unpatentability of Claims 1–3 Based on Ishikawa

Petitioner contends that independent claim 1 is anticipated under 35 U.S.C. § 102(b) by Ishikawa and that dependent claims 2 and 3 are unpatentable under 35 U.S.C. § 103(a) as obvious over Ishikawa. Pet. 23–38. Citing the declaration of Dr. Rabbani for support, Petitioner alleges that Ishikawa discloses each limitation of claim 1 and that it would have been obvious to a person of ordinary skill in the art to implement the additional limitations recited in claims 2 and 3. *Id.* (citing Ex. 1006 ¶¶ 67–78, 92, 404, 407–409, 411–413, 415–418). In response, Patent Owner argues that the Petition fails to show that Ishikawa discloses or renders obvious certain limitations. Prelim. Resp. 29–40. As discussed below, we agree with Patent Owner that Petitioner has not demonstrated a reasonable likelihood of prevailing on these grounds.

Claim 1 recites a machine-readable recording medium on which are recorded a first still picture encoded by a first encoding process, a second still picture encoded by a second encoding process different from the first encoding process, and a picture with a smaller number of pixels than the first and second pictures. Ex. 1001, 14:43–45, 14:49–50, 14:53–55, 14:56–58. Petitioner points to Ishikawa’s image data encoded using a first encoding process based on JPEG as disclosing the claimed first still picture. Pet. 30 (citing Ex. 1002 ¶¶ 15–16). For the second still picture encoded by a second encoding method, Petitioner relies on Ishikawa’s disclosure of “nth encoded data . . . generated using the same image signal by way of an nth encoding

format.” *Id.* at 32–34 (citing Ex. 1002 ¶ 21). Finally, Petitioner cites Ishikawa’s small image, which is encoded using RGB format and stored as thumbnail data, as disclosing the claimed picture with a smaller number of pixels. *Id.* at 34–36 (citing Ex. 1002 ¶¶ 19, 22).

Claim 1 also requires that the first still picture, second still picture, and picture each have “descriptive information associated therewith to allow a machine to recognize and decode” them for display. Ex. 1001, 14:46–48, 14:51–55, 14:59–61. The term “descriptive information” does not appear in the ’760 patent outside of the claims. As the file history indicates, the applicant added the phrase “having descriptive information associated therewith to allow a machine to recognize and decode the . . . picture for display” to each “picture” limitation in claim 1 during prosecution of the application that led to the ’760 patent. Ex. 1008, 14 (showing amended claim language). In remarks accompanying the amendment, the applicant asserted: “It is respectfully submitted that it was well within the purview of those skilled in the art to be able to implement some type of *descriptive information* (e.g., *header, filename extension*, etc.) associated with the respective pictures so as to allow the machine to recognize and decode the pictures.” *Id.* at 21 (emphasis added).

In view of the amendment and remarks made by the applicant during prosecution, Petitioner advances two reasons why Ishikawa discloses the “descriptive information” limitations of claim 1. Pet. 31–32, 34–36. First, relying on the testimony of Dr. Rabbani, Petitioner contends that, with respect to the first still picture and the picture with a smaller number of pixels (i.e., the thumbnail image), a person of ordinary skill in the art would have understood Ishikawa’s CPU-generated “arbitrarily formatted header

and footer” to include the type of “descriptive information” the ’760 patent contemplates. *Id.* at 31 (citing Ex. 1006 ¶¶ 92, 407); *see* Ex. 1002 ¶ 17 (“[T]he CPU generates an arbitrarily formatted header and footer (for example, information for date and time of photographing or the like) for the [first] encoded image and records the same with the image data in the memory 111.”); *id.* ¶ 20 (“[I]n the same manner as in the first encoding process, the CPU 106 generates and records a header and a footer for RGB signal data as necessary.”). Second, for all three “descriptive information” limitations, including the descriptive information associated with the second still picture, Petitioner points to Ishikawa’s disclosure “that external equipment (e.g., a computer) accesses a data file (e.g., the first or second encoded data) through its OS (operating system) and such image data is displayed there.” Pet. 31 (citing Ex. 1002 ¶¶ 30–31); *see also id.* at 34 (same); *id.* at 36 (same). In view of this disclosure, Petitioner submits that a person of ordinary skill in the art “would understand that each image file has its file name with extension . . . through which an OS can access the file and display it,” thereby satisfying the claimed “descriptive information associated therewith to recognize and decode” each picture for display. *Id.* at 31, 34, 36.

We agree with Patent Owner that the Petition fails to show that Ishikawa discloses each picture “having descriptive information associated therewith to allow a machine to recognize and decode the . . . picture for display.” *See* Prelim. Resp. 35–39. With respect to Petitioner’s first argument, Petitioner does not explain how Ishikawa’s arbitrarily formatted header and footer contain descriptive information that “allow[s] a machine to recognize and decode” a picture for display, as the claim language

requires. *See* Pet. 31. The only example of header or footer information in Ishikawa is the date and time of photographing, and Petitioner does not identify any disclosure in Ishikawa that such information may be used to decode a picture for display. *See id.*

Nor does the cited testimony of Dr. Rabbani support Petitioner's argument regarding Ishikawa's header and footer. In paragraph 92 of his declaration, Dr. Rabbani describes information that a decoder needs to reproduce an original image from a decoded bitstream, such as image dimensions, whether the image is grayscale or color, and the values of all compression parameters and settings used in compressing the image. Ex. 1006 ¶ 92. Dr. Rabbani testifies that most of the required information for decoding a compressed JPEG image is found in the JPEG header but that some information may be contained in the header of a more general file format that wraps around the JPEG bitstream. *Id.* Paragraph 407 of Dr. Rabbani's declaration quotes the statement from the file history of the '760 patent regarding descriptive information, refers back to paragraph 92 of his declaration, and asserts that a person of ordinary skill in the art "would have known that such information is necessary for a device to recognize and play back an image." *Id.* ¶ 407. These cited portions of Dr. Rabbani's declaration, however, do not discuss Ishikawa at all, and therefore provide insufficient evidentiary support for Petitioner's contention that a person skilled in the art would understand Ishikawa's arbitrarily formatted header and footer to include "descriptive information" as recited in claim 1 of the '760 patent.

Petitioner's second argument regarding file name extensions fares no better. Petitioner provides no support for its statement that a person of

ordinary skill in the art would understand that each image file in Ishikawa has a file name with an extension through which an operating system can access the file and display it. *See* Pet. 31–32. For example, the Petition does not rely on Dr. Rabbani’s testimony, nor do we see any discussion of this issue in his declaration. *See id.*; *see generally* Ex. 1006. Furthermore, no portion of Ishikawa, including the two paragraphs cited by Petitioner, discusses file name extensions or otherwise discloses descriptive information that would allow a machine to decode a picture for display. *See* Ex. 1002 ¶¶ 30–31. Moreover, even if Ishikawa did disclose file name extensions, the Petition fails to explain how a file name extension provides sufficient descriptive information allowing a machine both to recognize and to decode a picture. *See* Pet. 31–32. Thus, Petitioner’s position is merely unsupported attorney argument and is unpersuasive on the record before us.

For these reasons, Petitioner has not made a sufficient showing that Ishikawa discloses each and every limitation of claim 1. Accordingly, the information presented does not demonstrate a reasonable likelihood that Petitioner would prevail in establishing that claim 1 is anticipated by Ishikawa.

Petitioner’s arguments regarding alleged obviousness of dependent claims 2 and 3 over Ishikawa do not cure the deficiency discussed above with respect to the “descriptive information” limitation of claim 1. *See* Pet. 37–38. Accordingly, for the same reasons discussed above, the information presented does not demonstrate a reasonable likelihood that Petitioner would prevail in establishing that claims 2 and 3 would have been obvious over Ishikawa.

*E. Asserted Obviousness of Claims 4–15 over Takaichi and
Ishikawa*

In contrast to claim 1, which is directed to a machine-readable recording medium, claims 4–15 of the '760 patent are directed to either a video reproducing method (claims 4–9) or a video reproducing apparatus (claims 10–15). Petitioner contends that claims 4–15 are unpatentable under 35 U.S.C. § 103(a) as obvious over the combined teachings of Takaichi and Ishikawa. Pet. 38–69. Relying on the declaration of Dr. Rabbani for support, Petitioner alleges that Takaichi teaches every limitation of claims 4–15 except “reproducing . . . a second still picture . . . from a recording medium, wherein said . . . second still picture is encoded by a second encoding method different from the first encoding method.” *Id.* at 38–39, 54–69; *see* Ex. 1006 ¶¶ 452–494. For that limitation, Petitioner relies on Ishikawa’s description of a plurality of different encoding processes. Pet. 39 (citing Ex. 1002 ¶ 9).

Petitioner also alleges that a person of ordinary skill in the art would have had reason to incorporate Ichikawa’s “flexible encoding scheme” into Takaichi to create a system that could reproduce the same still image in more than one format. *Id.* at 39–54 (citing Ex. 1006 ¶¶ 419–451). Specifically, Petitioner asserts that Takaichi recognizes the compatibility issues inherent between an encoding method used in an imaging device and a decoding method used in a playback device. Pet. 41–44. Petitioner then contends that Ishikawa provides a solution to the compatibility issues—a method for encoding the same image using a plurality of encoding methods. *Id.* at 44–46. According to Petitioner, incorporating Ishikawa’s “nth encoding format” into Takaichi’s camera to address the alleged

compatibility issues would have been “straightforward and desirable” and would have provided “known benefits.” *Id.* at 46–54.

Patent Owner argues, among other things, that Petitioner fails to carry its burden to show why one of ordinary skill in the art would have combined the references in the manner proposed by Petitioner. Prelim. Resp. 42–44. We agree with Patent Owner. In particular, we are persuaded that Petitioner’s asserted rationale for combining Ishikawa with Takaichi rests on a “flawed premise.” *See id.* at 42. Petitioner’s reasoning for why a person of ordinary skill in the art would have combined the references in the manner asserted is based on Takaichi’s alleged recognition of compatibility issues arising from the choice of an encoding method used in an imaging device, i.e., the possibility that the encoding method will not be compatible with the decoding method in a playback device. *See* Pet. 41–44. As Patent Owner asserts, however, Takaichi does not actually recognize such compatibility issues. *See* Prelim. Resp. 42. Rather, the data expansion unit in Takaichi that receives and decodes image files simply “expands the compressed image data by a method that corresponds to the compression method in the image data compression unit.” Ex. 1004 ¶ 20. Thus, Takaichi appears to assume that the receiving unit has the ability to decompress the image data.

Petitioner cites Takaichi’s disclosure of various receiving devices such as “video cameras, digital cameras, scanners, and the like,” but does not point to any discussion in Takaichi of compatibility issues associated with these devices. Pet. 42 (citing Ex. 1004 ¶ 2); *see* Prelim. Resp. 43. Petitioner also refers to Takaichi’s disclosure of a plurality of encoding methods, including MPEG and JPEG, but again does not identify any

reference in Takaichi to compatibility issues between image formats and receivers. Pet. 42 (citing Ex. 1004 ¶¶ 9, 11); *see* Prelim. Resp. 43.

Relying on Dr. Rabbani’s testimony, Petitioner further asserts that a person of ordinary skill in the art “would realize that such dedicated devices [(i.e., video cameras, digital cameras, etc.)] would likely have limitations on the types of encoding methods they are able to decode” and that “[e]ach encoding method would require receiving devices having a specific decoder, further indicating the compatibility issue.” Pet. 42–43 (citing Ex. 1006 ¶ 421). Dr. Rabbani’s declaration, however, repeats verbatim the same conclusory assertions as the Petition without additional evidentiary support. *Compare* Ex. 1006 ¶ 421, *with* Pet. 42–43. Therefore, Dr. Rabbani’s testimony on this point is entitled to little or no weight. *See* 37 C.F.R. § 42.65(a).

For at least these reasons, we are persuaded that Petitioner has not articulated reasoning with rational underpinnings for why a person of ordinary skill in the art would have modified Takaichi’s system, which compresses a still image using one encoding method and decompresses it using a corresponding decoding method, to have the ability to reproduce a first still picture and second still picture derived from common signal data and encoded by two different encoding methods, as required in claims 4–15. Thus, the information presented does not show a reasonable likelihood that Petitioner would prevail in establishing that claims 4–15 would have been obvious over the combination of Takaichi and Ishikawa.

III. CONCLUSION

After considering the evidence and arguments presented in the Petition and Preliminary Response, we determine the information presented

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does not demonstrate a reasonable likelihood that Petitioner would prevail in showing that at least one of the challenged claims of the '760 patent is unpatentable.

IV. ORDER

Accordingly, it is:

ORDERED that the Petition is *denied*, and no *inter partes* review is instituted.

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mword@mayerbrown.com
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PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail**

Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
(703) 746-4000

501.37977CX3

or **Fax**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

020457 7590 08/20/2004

ANTONELLI, TERRY, STOUT & KRAUS, LLP
 1300 NORTH SEVENTEENTH STREET
 SUITE 1800
 ARLINGTON, VA 22209-9889

11/24/2004 CCHAU2 00000023 10191504

01 FC:1501
 02 FC:1504

1370.00 OR
 300.00 DP

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (703) 746-4000, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/191,504	07/10/2002	Masaru Takahashi	501.37977CX3	7116

TITLE OF INVENTION: RECORDING MEDIUM

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1330	\$300	\$1630	11/22/2004

EXAMINER	ART UNIT	CLASS-SUBCLASS
BOCCIO, VINCENT F	2616	386-120000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
 (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1. Antonelli, Terry,
Stout & Kraus, LLP
 2. _____
 3. _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

HITACHI, LTD.

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Tokyo, Japan

Please check the appropriate assignee category or categories (will not be printed on the patent); ☐ individual ☒ corporation or other private group entity ☐ government

4a. The following fee(s) are enclosed:

- ☒ Issue Fee
☒ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s):

- ☐ A check in the amount of the fee(s) is enclosed.
☒ Payment by credit card. Form PTO-2038 is attached.
☒ The Director is hereby authorized to charge the required fee(s), or credit any overpayment, to Deposit Account Number 01-2135 (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is not claiming SMALL ENTITY status. See, e.g., 37 CFR 1.27(g)(2).

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above.

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

(Authorized Signature) Paul J. Skwierawski (Date) 22 November 2004
 Reg. No. 32,173

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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TRANSMIT THIS FORM WITH FEE(S)



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

020457 7590 08/20/2004
ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 NORTH SEVENTEENTH STREET
SUITE 1800
ARLINGTON, VA 22209-9889

EXAMINER

BOCCIO, VINCENT F

ART UNIT

PAPER NUMBER

2616

DATE MAILED: 08/20/2004

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/191,504	07/10/2002	Masaru Takahashi	501.37977CX3	7116

TITLE OF INVENTION: RECORDING MEDIUM

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1330	\$300	\$1630	11/22/2004

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE REFLECTS A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE APPLIED IN THIS APPLICATION. THE PTOL-85B (OR AN EQUIVALENT) MUST BE RETURNED WITHIN THIS PERIOD EVEN IF NO FEE IS DUE OR THE APPLICATION WILL BE REGARDED AS ABANDONED.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL should be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). Even if the fee(s) have already been paid, Part B - Fee(s) Transmittal should be completed and returned. If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

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020457 7590 08/20/2004

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1300 NORTH SEVENTEENTH STREET
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ARLINGTON, VA 22209-9889

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(Depositor's name)
(Signature)
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	ART UNIT	CLASS-SUBCLASS
BOCCIO, VINCENT F	2616	386-120000

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- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, _____ 1
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. _____ 2
- _____ 3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

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(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent); ☐ individual ☐ corporation or other private group entity ☐ government

4a. The following fee(s) are enclosed:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

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The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above.

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

(Authorized Signature)

(Date)

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/191,504	07/10/2002	Masaru Takahashi	501.37977CX3	7116
020457	7590	08/20/2004		
ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-9889			EXAMINER BOCCIO, VINCENT F	
			ART UNIT	PAPER NUMBER
			2616	

DATE MAILED: 08/20/2004

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 0 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 0 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (703) 305-1383. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at (703) 305-8283.

Q-13

Notice of Allowability	Application No.	Applicant(s)	
	10/191,504	TAKAHASHI ET AL.	
	Examiner	Art Unit	
	Vincent F. Boccio	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment 6/30/04.
2. ☒ The allowed claim(s) is/are 1-15.
3. ☒ The drawings filed on 10 July 2002 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/446,338.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

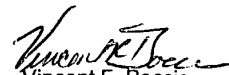
Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|---|
| 1. ☐ Notice of References Cited (PTO-892) | 5. ☐ Notice of Informal Patent Application (PTO-152) |
| 2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____ |
| 3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. ☐ Examiner's Amendment/Comment |
| 4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. ☐ Examiner's Statement of Reasons for Allowance |
| | 9. ☐ Other _____ |


Vincent F. Boccio
Primary Examiner
Art Unit: 2616

Interview Summary	Application No.		Applicant(s)	
	10/191,504		TAKAHASHI ET AL.	
	Examiner		Art Unit	
	Vincent F. Boccio		2615	

All participants (applicant, applicant's representative, PTO personnel):

(1) Vincent F. Boccio. (3) _____

(2) Paul Skwierawski #32173. (4) _____

Date of Interview: 29 June 2004.

Type: a) ☐ Telephonic b) ☐ Video Conference
c) ☒ Personal [copy given to: 1) ☐ applicant 2) ☒ applicant's representative]

Exhibit shown or demonstration conducted: d) ☐ Yes e) ☐ No.
If Yes, brief description: _____

Claim(s) discussed: Amended Proposed Claim 1-

Identification of prior art discussed: Timmermans.

Agreement with respect to the claims f) ☒ was reached. g) ☐ was not reached. h) ☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: Discussed proposed amendment to the claims, against 101 & 102, rejections, agreed that the proposed amendment overcomes Timmermans, the 101 issue seems moot in view the amendment and a further search and consideration is required. Since the proposed amendment raise new issue, a continuation is required for entry of the proposed amendment after final.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.


VINCENT BOCCIO
PRIMARY EXAMINER

Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.

Examiner's signature, if required

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record

A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews

Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.

All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of the specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner,
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

Best Available Copy

Application Number 	Application No. 10/191,504	Applicant(s) TAKAHASHI ET AL.	

TERMINAL DISCLAIMER	☒ APPROVED	☐ DISAPPROVED
Document Code - DISQ	This patent is subject to a Terminal Disclaimer	
INTERNAL DOCUMENT – DO NOT MAIL		

U.S. Patent and Trademark Office

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Issue Classification 	Application No.	Applicant(s)	
	10/191,504	TAKAHASHI ET AL.	
	Examiner	Art Unit	
	Vincent F. Boccio	2616	

ISSUE CLASSIFICATION										
ORIGINAL					CROSS REFERENCE(S)					
CLASS		SUBCLASS			CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
386		120			386	117				
INTERNATIONAL CLASSIFICATION					348	220	232			
H	0	4	N	5/91						
H	0	4	N	5/225						
				/						
				/						
				/						
_____ (Assistant Examiner) (Date)					VINCENT BOCCIO PRIMARY EXAMINER  (Primary Examiner)					Total Claims Allowed: 15
_____ (Legal Instruments Examiner) (Date)					8/6/84 (Date)					O.G. Print Claim(s) 1
										O.G. Print Fig. 1 & 2

☐ Claims renumbered in the same order as presented by applicant		☐ CPA		☐ T.D.		☐ R.1.47	
Final	Original	Final	Original	Final	Original	Final	Original
1	1		31		61		121
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4	3		33		63		123
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7	5		35		65		125
8	6		36		66		126
10	7		37		67		127
11	8		38		68		128
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Index of Claims 	Application No.		Applicant(s)	
	10/191,504		TAKAHASHI ET AL.	
	Examiner		Art Unit	
	Vincent F. Boccio		2616	

✓	Rejected
=	Allowed

—	(Through numeral) Cancelled
÷	Restricted

N	Non-Elected
I	Interference

A	Appeal
O	Objected

Claim		Date											
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1	1	11/26/02											
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Search Notes 		Application No. 10/191,504	Applicant(s) TAKAHASHI ET AL.	
		Examiner Vincent F. Boccio	Art Unit 2616	

SEARCHED			
Class	Subclass	Date	Examiner

INTERFERENCE SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	DATE	EXMR

Best Available Copy

10/191,504

SEARCH			
Class	Sub.	Date	Exmr.
386	120 117 112 121 124 125	7/24/01	✓
348	220.1 231.99 333.05		
Updated	Search all	3/27/04 8/4/04	✓

(List databases searched. Attach search strategy inside.)

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INTERFERENCE SEARCHED			
Class	Sub.	Date	Exmr.



501.37977CX3/219900637US04

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Masaru TAKAHASHI *et al.*
Serial No. : 10/191,504RCE
Filed : 10 July 2002
For : RECORDING MEDIUM
Art Unit : 2615
Examiner : V.F. Boccio
Conf. No. : 7116

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JUL 06 2004

Technology Center 2600

AMENDMENT
AND
STATEMENT OF SUBSTANCE

Commissioner for Patents
POB 1450
Alexandria, Virginia 22313-1450

30 June 2004

Sir:

In response to the Office Action mailed 07 April 2004 in connection with the above-identified application, the following amendments and remarks are respectfully submitted.

In accordance with the revised format of the manner of making amendments under 37 CFR §1.121 as set forth in the Final Rule effective 30 July 2003, each section of amendment herein begins on a new page, and changes are shown by strike-through (or double brackets where appropriate) and underlining to indicate deletions and additions, respectively. A complete listing of all claims ever presented in the application is given with the current status of each claim, and only the text of all pending and withdrawn claims is presented in full, with those not being amended herein being presented in clean version.

IN THE CLAIMS:

1. (Currently Amended) A machine-readable recording medium comprising:
for recording thereon:

a first still picture recorded thereon encoded by a first encoding method,
wherein the first still picture having descriptive information associated therewith to
allow a machine to recognize and decode the first still picture for display;

a second still picture recorded thereon encoded by a second encoding
method, wherein the second still picture having descriptive information associated
therewith to allow the machine to recognize and decode the second still picture for
display, wherein the second encoding method is different from the first encoding
method; and

a picture recorded thereon corresponding to said first and second still
pictures, which has a smaller number of pixels than said first and second still
pictures, wherein the picture having descriptive information associated therewith to
allow the machine to recognize and decode the picture for display,

wherein said first still picture, said second still picture and said picture are
related pictures derived from common signal data. ~~represent the same object.~~

2. (Previously Presented) A recording medium in accordance with claim 1,
wherein said first still picture is encoded by the MPEG standard as the first encoding
method, and said second still picture is encoded by the JPEG standard as the
second encoding method.

3. (Currently Amended) A video reproducing method, comprising:

reproducing at least a first still picture, a second still picture and a picture from a recording medium, wherein said first still picture is encoded by a first encoding method, said second still picture is encoded by a second encoding method different from the first encoding method, and said picture corresponds to said first and second still pictures and has a smaller number of pixels than said first and second still pictures, and wherein said first still picture, said second still picture and said picture are related pictures derived from common signal data; ~~represent the same object;~~

outputting a plurality of pictures from the reproducing operation; and

outputting said first still picture corresponding to a selected picture.

4. (Previously Presented) A video reproducing method in accordance with

claim 3, wherein said first encoding method is the MPEG standard and said second encoding method is the JPEG standard.

5. (Currently Amended) A video reproducing method, comprising:

reproducing at least a first still picture, a second still picture and a picture recorded on a recording medium, wherein said first still picture is encoded by a first encoding method, said second still picture is encoded by a second encoding method different from the first encoding method, and said picture corresponds to said first and second still pictures and has a smaller number of pixels than said first and second still pictures, and wherein said first still picture, said second still picture and

said picture are related pictures derived from common signal data; ~~represent the same object~~;

displaying a plurality of pictures from the reproducing operation; and

displaying said first still picture corresponding to a selected picture.

6. (Previously Presented) A video reproducing method in accordance with claim 5, wherein said first encoding method is the MPEG standard and said second encoding method is the JPEG standard.

7. (Currently Amended) A video reproducing apparatus, comprising:

reproducing means for reproducing at least a first still picture, a second still picture and a picture from a recording medium, wherein said first still picture is encoded by a first encoding method, said second still picture is encoded by a second encoding method different from the first encoding method, and said picture corresponds to said first and second still pictures and has a smaller number of pixels than said first and second still pictures, and wherein said first still picture, said second still picture and said picture are related pictures derived from common signal data; ~~represent the same object~~;

first outputting means for outputting a plurality of reproduced pictures from the reproducing operation; and

second outputting means for outputting said first still picture corresponding to a selected picture.

8. (Previously Presented) A video reproducing apparatus in accordance with claim 7, wherein said first encoding method is the MPEG standard and said second encoding method is the JPEG standard.

9. (Currently Amended) A video reproducing apparatus, comprising:
reproducing means for reproducing at least a first still picture, a second still picture and a picture from a recording medium, wherein said first still picture is encoded by a first encoding method, said second still picture is encoded by a second encoding method different from the first encoding method, and said picture corresponds to said first and second still pictures and has a smaller number of pixels than said first and second still pictures, and wherein said first still picture, said second still picture and said picture are related pictures derived from common signal data; and ~~represent the same object; and~~

displaying means for displaying at least one of said first still picture, said second still picture and said first picture;

wherein said displaying means displays a plurality of reproduced pictures from the reproducing means, and wherein said displaying means displays said first still picture corresponding to a selected picture.

10. (Previously Presented) A video reproducing method in accordance with claim 9, wherein said first encoding method is the MPEG standard and said second encoding method is the JPEG standard.

11. (Previously Presented) A recording medium in accordance with claim 1, wherein said first encoding method is according to a first encoding standard and said second encoding method is according to a second encoding standard.

12. (Previously Presented) A video reproducing method in accordance with claim 3, wherein said first encoding method is according to a first encoding standard and said second encoding method is according to a second encoding standard.

13. (Previously Presented) A video reproducing method in accordance with claim 5, wherein said first encoding method is according to a first encoding standard and said second encoding method is according to a second encoding standard.

14. (Currently Amended) A video reproducing apparatus method in accordance with claim 7, wherein said first encoding method is according to a first encoding standard and said second encoding method is according to a second encoding standard.

15. (Currently Amended) A video reproducing apparatus method in accordance with claim 9, wherein said first encoding method is according to a first encoding standard and said second encoding method is according to a second encoding standard.

REMARKS

This Amendment is responsive to the Office Action identified above, and is further responsive in any other manner indicated below.

EXAMINER INTERVIEW ACKNOWLEDGED

This paper is responsive to the Examiner Interview conducted 29 June 2004, by and between (as indicated on the Interview Summary document) Primary Examiner Vincent Boccio and attorney Paul J. Skwierawski, in the present application. More particularly, any foregoing amendments may include amendments discussed during, or resultant from, the Examiner Interview, and the following includes a reiteration of discussions/arguments had during the Examiner Interview.

PENDING CLAIMS

Claims 1-15 were pending in the application at the time of the Office Action. Unrelated to any prior art, scope or rejection, appropriate Claims have been amended or added in order to adjust a clarity and/or focus of Applicant's claimed invention. That is, the amendments to the claims are unrelated to any prior art or scope adjustment, and are simply clarified claims in which Applicant is presently interested. At entry of this paper, Claims 1-15 remain pending in the application for consideration and examination.

NON-REWRITTEN ALLOWABLE CLAIMS

Although Claims 2, 4, 6, 8 and 10 have been indicated as being allowable if rewritten, as indicated within the section number "3" on page 4 of the Office Action, rewriting has not yet been effected as it is believed that any base and intervening claims will be allowed responsive to this paper. Applicant respectfully reserves the right to rewrite the potentially allowable claims at a later time if necessary, and Applicant and the undersigned respectfully thank the Examiner for such indication of potentially allowable subject matter.

STANDING 35 USC §101 REJECTION - TRAVERSED

Claim 1 has been rejected under 35 USC §101 as being allegedly directed to non-statutory subject matter, *i.e.*, for the concerns listed within Item 2 beginning on page 2 of the Office Action. Applicant continues to respectfully traverse the rejection.

More particularly, Claim 1 definitely and easily meets §101 statutory subject matter requirements. Office Action comments admit that Claim 1 satisfies the utility requirements of 35 USC §101, and appears to be requiring that "significant functionality" also be shown (*e.g.*, in accordance with text recited within MPEP §2106). Applicant respectfully submits that Applicant's prior claims contained sufficient §101 functionality. More particularly, Applicant's recording medium had storeable therein three types of pictures (*i.e.*, first still picture with first encoding, second still picture with second encoding, and low resolution picture). A functionality of such claimed invention is that it represented a versatile picture storage which allowed any machine (*e.g.*, computer) using such medium to quickly display the low

resolution picture first. Further, by having first and second pictures of differing encodings, the likelihood was higher that the machine would be able to thereafter recognize and display one of the first and second pictures (having better image quality than the low resolution picture).

Moreover, it is respectfully submitted that the machine (*e.g.*, computer) would have been able to function or operate with such first still picture with first encoding, second still picture with second encoding, and low resolution picture, *i.e.*, without the claims explicitly reciting any picture "headers" useable by the machine. More particularly, as stated in MPEP §2106, "Office personnel must always remember to use the perspective of one skilled in the art....If elements of an invention are well known in the art, the applicant does not have to provide a disclosure which describes those elements. In such a case, the elements will be recognized as encompassing any and every part of recognized hardware or combination of hardware and software technique for implementing the defined requisite functionalities." It is respectfully submitted that it was well within the purview of those skilled in the art to be able to implement some type of descriptive information (*e.g.*, header, filename extension, etc.) associated with the respective pictures so as to allow the machine to recognize and decode the pictures.

Again, it appears that the rejection may stem from an Examiner's preference to have Claim 1 recite more of a picture-type claim, wherein further features/limitations are included within the claim. However, it is respectfully submitted that a picture-type claim is not required under US patent law, *i.e.*, all that is required is that sufficient features/limitations are recited to distinguish over the art.

Applicant's Claim 1 contains sufficient features/limitations to distinguish, as set forth in arguments made hereinafter.

Accordingly, Applicant respectfully submits that the standing 35 USC §101 rejection of independent Claim 1 is improper and should be withdrawn. Based upon the foregoing, reconsideration and withdrawal of the §101 rejection of Claim 1 are respectfully requested.

REJECTION UNDER 35 USC §102

The 35 USC §102 rejection of Claims 1, 3, 5, 7, 9 and 11-15 as being unpatentable over Timmermans (US 5,583,653 A) is respectfully traversed. Such rejection has been rendered obsolete by the present clarifying amendments to Applicant's claims, and accordingly, traversal arguments are not appropriate at this time. However, Applicant respectfully submits the following to preclude renewal of any such rejections against Applicant's clarified claims.

All descriptions of Applicant's disclosed and claimed invention, and all descriptions and rebuttal arguments regarding the applied prior art, as previously submitted by Applicant in any form, are repeated and incorporated herein by reference. Further, all Office Action statements regarding the prior art rejections are respectfully traversed. As additional arguments, Applicant respectfully submits the following.

In order to properly support a §102 anticipatory-type rejection, any applied art reference must disclose each and every limitation of any rejected claim. The applied art does not adequately support a §102 anticipatory-type rejection because, at

minimum, such applied art does not disclose (or suggest) the following discussed limitations of Applicant's claims.

Applicant's disclosed and claimed invention is directed to improved picture storing arrangements. More particularly, Applicant's disclosed and claimed invention (e.g., clarified Claim 1) includes the features/limitations of: a first still picture recorded thereon encoded by a first encoding method, wherein the first still picture having descriptive information associated therewith to allow a machine to recognize and decode the first still picture for display; a second still picture recorded thereon encoded by a second encoding method, wherein the second still picture having descriptive information associated therewith to allow the machine to recognize and decode the second still picture for display, wherein the second encoding method is different from the first encoding method; and, a picture recorded thereon corresponding to said first and second still pictures, which has a smaller number of pixels than said first and second still pictures, wherein the picture having descriptive information associated therewith to allow the machine to recognize and decode the picture for display, wherein said first still picture, said second still picture and said picture are related pictures derived from common signal data. Claim 2, for example, recites the features/limitations: wherein said first still picture is encoded by the MPEG standard as the first encoding method, and said second still picture is encoded by the JPEG standard as the second encoding method. Accordingly, Applicant's two highest resolution pictures are encoded according to differing standards, e.g., MPEG and JPEG. The other ones of Applicant's claims have similar or analogous features/limitations.

From language differentiation within Claim 1, it is clear that treatment of Applicant's first and second still pictures concern mutually differing encoding, while Applicant's picture concerns resolution. That is, it is clear from Applicant's specification and claims that encoding is different from resolution.

Turning now to rebuttal of the applied reference, it is respectfully submitted that Timmermans is deficient as a reference in that Timmermans does not disclose or suggest any arrangement disclosing or suggesting Applicant's "first still picture...encoded by a first encoding method, second still picture...encoded by a second encoding method,...and, a picture which has a smaller number of pixels than said first and second still pictures." That is, Timmermans appears to disclose pictures all using a common encoding method, but of differing resolutions. Office Action comments attempt to improperly equate Timmermans' changing resolution as differing types of encoding. Accordingly, it is respectfully submitted that such Office Action comments and characterization are improper and should be withdrawn.

As a result of all of the foregoing, it is respectfully submitted that the applied art (taken alone and in the Office Action combinations) would not support a §102 obviousness-type rejection of Applicant's claims. Accordingly, reconsideration and withdrawal of such §102 rejection, and express written allowance of all of the §102 rejected claims, are respectfully requested.

EXTENSIVE PROSECUTION NOTED

Applicant and the undersigned respectfully note the extensive prosecution which has been conducted to date with the present application, and thus Applicant

and the undersigned would gratefully appreciate any considerations or guidance from the Examiner to help move the present application quickly to allowance.

RESERVATION OF RIGHTS

It is respectfully submitted that any and all claim amendments and/or cancellations submitted within this paper and throughout prosecution of the present application are without prejudice or disclaimer of any scope or subject matter. Further, Applicant respectfully reserves all rights to file subsequent related application(s) (including reissue applications) directed to any/all previously claimed limitations/features which have been subsequently amended or cancelled, or to any/all limitations/features not yet claimed, *i.e.*, Applicant continues (indefinitely) to maintain no intention or desire to dedicate or surrender any limitations/features of subject matter of the present application to the public.

EXAMINER INVITED TO TELEPHONE

The Examiner is invited to telephone the undersigned at the local D.C. area telephone 703-312-6600, to discuss an Examiner's Amendment or other suggested action for accelerating prosecution and moving the present application to allowance.

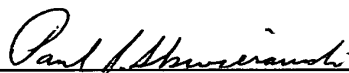
CONCLUSION

In view of the foregoing amendments and remarks, Applicant respectfully submits that the claims listed above as presently being under consideration in the

application are in condition for allowance. Accordingly, early allowance of such claims is respectfully requested.

This Amendment is being filed concurrently with a Request for Continued Examination (RCE), and is therefore timely, so no Petition for extension of time or fee is necessary. To whatever other extent is actually appropriate, Applicant respectfully petitions the Commissioner for an extension of time under 37 CFR §1.136. Further, no fees are required for entry of this Amendment. A Form PTO-2038 is submitted concurrently herewith which includes authorization for payment of the requisite filing fee of the RCE. Please charge any actual shortage in fees due to ATS&K Deposit Account No. 01-2135 (referencing Case No. 501.37977CX3).

Respectfully submitted,



Paul J. Skwierawski
Registration No. 32,173
ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 North Seventeenth Street, Suite 1800
Arlington, Virginia 22209-3801, USA
Telephone 703-312-6600
Facsimile 703-312-6666

Concurrent Submissions:
RCE
Form PTO-2038 (Fee Code 1801)

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

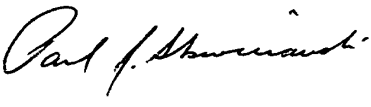
PTO/SB/30 (09-03)
Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

REQUEST FOR CONTINUED EXAMINATION (RCE) TRANSMITTAL	
Address to: Mail Stop RCE Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450	Application Number
	Filing Date
	First Named Inventor
	Group Art Unit
	Examiner Name
	Attorney Docket Number

This is a Request for Continued Examination (RCE) under 37 C.F.R. § 1.114 of the above-identified application.

Request for Continued Examination (RCE) practice under 37 CFR §1.114 does not apply to any utility or patent application filed prior to 8 June 1995, or to any design application. See instruction Sheet for RCEs (not to be submitted to the USPTO).

1. **Submission required under 37 CFR §1.114** Note: If the RCE is proper, any previously-filed unentered Amendments and Amendments enclosed with the RCE will be entered in the order in which they were filed unless Applicant instructs otherwise. If Applicant does not wish to have any previously-filed unentered Amendment(s) entered, Applicant must request non-entry of such Amendment(s).
- a. ☐ Previously submitted (If a final Office Action is outstanding, any amendments filed after the final Office Action may be considered as a submission even if this box is not checked.):
- i. ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on **RECEIVED**
- ii. ☐ Other: _____
- ☒ Enclosed:
- i. ☒ Amendment and Statement of Substance.
- ii. ☐ Affidavit(s)/Declaration(s).
- iii. ☐ Information Disclosure Statement (IDS)/Form PTO-1449/Reference(s).
- iv. ☐ Petition For Extension Of Time Under 37 CFR §1.136 (____ Months).
- v. ☐ Other: _____
2. **Miscellaneous**
- a. ☐ Suspension of action on the above-identified application is requested under 37 CFR §1.103(c) for a period of ____ months. (Period of suspension shall not exceed 3 months; Fee under 37 C.F.R. § 1.17(i) required)
- b. ☐ Other: _____
3. **Fees** The RCE fee under 37 CFR. §1.17(e) is required by 37 CFR §1.114 when RCE is filed.
- a. ☒ The Director is hereby authorized to charge **DEFICIENCIES ONLY** in the following fees, or credit any overpayments, to ATSK Deposit Account No. **01-2135**.
- i. ☒ RCE Fee required under 37 CFR § 1.17(e)/Additional Claims Fee(s) (Fee Code(s) **1801**) (**NO ADDITIONAL CLAIM FEES ARE REQUIRED**).
- ii. ☐ Extension of time fees (37 CFR §§ 1.136 and 1.17) (Fee Code ____).
- iii. ☐ Other: _____ (Fee Code ____).
- b. ☐ Check in the amount of \$ ____ enclosed.
- c. ☒ Credit Card Payment Form PTO-2038.
- WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on Form PTO-2308.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED			
Name (Print/Type)	Paul J. Skwierawski	Registration No. (Attorney/Agent)	32,173
Signature		Date	30 June 2004
CERTIFICATE OF MAILING OR TRANSMISSION			
I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to Commissioner For Patents, Mail Stop RCE, P.O. Box 1450, Alexandria, VA 22313-1450, or facsimile transmitted to the U.S. Patent and Trademark Office, on the date shown below.			
Name (Print/Type)			
Signature		Date	

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/191,504	07/10/2002	Masaru Takahashi	501.37977CX3	7116
20457	7590	04/07/2004		
ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-9889			EXAMINER BOCCIO, VINCENT F	
			ART UNIT	PAPER NUMBER
			2615	8

DATE MAILED: 04/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/191,504	TAKAHASHI ET AL.	
	Examiner	Art Unit	
	Vincent F. Boccio	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on TD, Amend-B & IDS.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,5,7,9 and 11-15 is/are rejected.
- 7) ☒ Claim(s) 2,4,6,8 and 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/446,338.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) ☒ Notice of References Cited (PTO-892) | 4) ☐ Interview Summary (PTO-413) |
| 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) ☐ Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u> </u> | 6) ☐ Other: _____ |

Art Unit: 2615

DETAILED ACTION
Response to Arguments

1. Applicant's arguments with respect to amended claims 1-2 and newly presented claims 3-15 have been considered but are moot in view of the new ground(s) of prior art rejection.

2. Applicant's arguments against amended claim 1, have been fully considered but they are not persuasive, with respect to the 101 rejection previously made and maintained by the examiner.

{A} In re applicant state, since, "claim 1 recites a physical object (i.e. a recording medium), and such an object has utility".

In response the examiner agrees, but, the issue is not utility, the issue with the medium claim, is the claim is void of any language dictating, some sort of "Functional Descriptive Material", that is read by a machine, such as a general purpose computer, to provide a means to decode the data, such as with respect to the MPEG standard, recited in claim 2, the examiner considers on, "a current mind set/understanding", under the 101 analysis, that the MPEG standard provides inherently, functional descriptive material in the form of the header data to allow the computer to locate, read, interpret and decode the data from the media to a display for example.

Claim 1, fails to recite or any limitation fails to show, suggest that there exists function descriptive material in any way, therefore, the 101 rejection stands in view of the recited elements claimed.

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claim 1 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 1 which recites,

A recording medium for recording thereon:

0 **a first still picture** encoded by a first encoding method

0 **second still pictures** encoded by a second encoding method;

and

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O a picture corresponding to the first and second still pictures, which has a smaller number of pixels than the first and second still pictures, wherein the first, second and picture represent the same object.

Again, claim 1, fails to recite any functional descriptive material recorded on the medium with the moving or still images or any linking information between, therefore, the medium merely is for recording the first and second still images and the picture, therefore the claims recite no distinct or specific structure or format and therefore are not directed toward statutory subject matter.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 3, 5, 7, 9 and 11-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Timmermans (US 5,583,653).

Regarding claim 1, Timmermans disclose and meets the limitations associated with a medium for recording thereon:

- first still pictures by a first encoding method (col. 7, "scanned picture" or a still image, with a resolution corresponding to an NTSC or Pal TV picture

or met by a reduced image by a factor of 2);

- second still pictures by a second encoding method and a picture;

(met by multiple encoding stages, or different encoding methods, wherein the image is reduced by a factor of 2, 4, 8, 16, therefore, different encoding methods and images);

and

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wherein the picture corresponding to the first and second still pictures, which have or having a smaller number of pixels (col. 7, lines 37-67) than the first and second still picture, wherein the first pictures, the second pictures and the pictures are of the same object (met by an encoding method with an additional factor of reduction with respect to the first and second still images, a reduction factor higher).

Regarding claims 3, 5, 7 and 9 Timmermans meets the limitations associated with a reproduction method, reproducing apparatus, having the medium with recited data structure, as analyzed and discussed above, meets the limitation of wherein the system can output a plurality of pictures from a reproducing operation and wherein outputting of the first still picture corresponding to a selected picture can be accomplished and is met by Timmermans (col. 4, lines 38-62, col. 2, line 49-, abstract).

Regarding claims 11-15, Timmermans further meets the limitation of first and second encoding standards, wherein as recited the claims fails to recite wherein the encoding methods are different,

furthermore, since Timmermans, provides multiple still pictures of different resolutions, also meets and reads on the recited limitation of different encoding standards, represented by different resolutions.

Allowable Subject Matter

3. Claims 2, 4, 6, 8, 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record fails to teach, fairly suggest, or disclose, including Timmermans, to suggest

- O a medium having first;
- O a second still images; and
- O a picture;

- O wherein the first still is encoded with respect to MPEG and the second still is encoded with respect to JPEG;

Art Unit: 2615

- O wherein the Picture has a smaller number of pixels than the first still picture (MPEG) and second still picture (JPEG);
- O wherein the first still and the second still and the picture, represent the same object.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Fax Information

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703) 872-9314, (for formal communication intended for entry)

or:

(703) 308-5359, (for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Application/Control Number: 10/191,504

Page 6

Art Unit: 2615

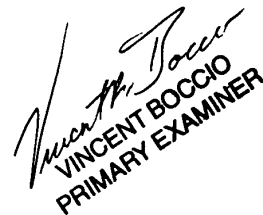
Contact Information

1. Any inquiry concerning this communication or earlier communications should be directed to the examiner of record, Monday-Thursday, 8:00 AM to 5:00 PM Vincent F. Boccio (703) 306-3022.

If any attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andy Christensen (703) 308-9644.

Any inquiry of a general nature or relating to the status of this application should be directed to Customer Service (703) 306-0377.

Primary Examiner, Boccio, Vincent
4/5/04


VINCENT BOCCIO
PRIMARY EXAMINER

Notice of References Cited	Application/Control No. 10/191,504	Applicant(s)/Patent Under Reexamination TAKAHASHI ET AL.	
	Examiner Vincent F. Boccio	Art Unit 2615	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-5,583,653 A	12-1996	Timmermans, Josef M. K.	386/46
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.



Sheet 1 of 1

Form PTO-1449	U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTY. DKT. NO. 501.37977CX3	SERIAL NO. 10/191,504
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary)		APPLICANT Masaru TAKAHASHI <i>et al.</i>	
		FILING DATE 10 July 2002	GROUP 2615

U.S. PATENT DOCUMENTS

Ex. Initial	Doc. No.	Date	Name	Class	Subclass	Filing Date
AA						
AB						
AC						
AD						
AE						
AF						
AG						
AH						

U.S. PATENT APPLICATIONS

	Application Number	Name	Filing Date
AI			
AJ			
AK			
AL			

FOREIGN PATENT DOCUMENTS

	Doc. No.	Date	Country	Class	Subclass	Translation/Abstract	
						Yes	No
VPS	AM	10-108133	04/24/1998	JP		Abstract	
	AN						
	AO						
	AP						
	AQ						
	AR						
	AS						
	AT						

OTHER DOCUMENTS

AU	
AV	
AW	
AX	
Examiner 	Date Considered 4/4/04



501.37977CX3/219900637US04

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

RECEIVED

FEB 12 2004

Applicant : Masaru TAKAHASHI *et al.*
Serial No. : 10/191,504
Filed : 10 July 2002
For : RECORDING MEDIUM
Art Unit : 2615
Examiner : V.F. Boccio
Conf. No. : 7116

RECEIVED

FEB 11 2004

Technology Center 2600

INFORMATION DISCLOSURE STATEMENT UNDER 37 CFR §1.97(c)

Commissioner for Patents
POB 1450
Alexandria, Virginia 22313-1450

10 February 2004

Sir:

In the matter of the above-identified application, Applicant hereby submits the attached information for consideration by the Office under 37 C.F.R. §§1.97 and 1.98 in the present application, and for printing on the face of any patent issuing hereon, as listed on the attached Form PTO-1449.

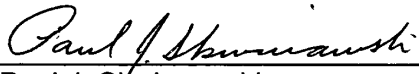
All of the information submitted herewith was first cited in a Japanese Patent Office (JPO) Action issued in a related foreign patent application on 9 December 2003, not more than three (3) months prior to the filing of this Statement.

In accordance with MPEP §609A(3), no separate concise explanation of relevance is required for the information that is not in the English language because an English language Abstract is submitted herewith for the cited reference.

This Statement is being submitted before issue of any action that closes prosecution in this case, and is accompanied by the statement under 37 CFR

§1.97(e)(1). Therefore, no Request or fee is necessary for entry and consideration of the attached information. To whatever other extent is actually possible and required, Applicant respectfully petitions the Commissioner for an extension of time under 37 CFR §1.136. Please charge any actual fees due to ATS&K Deposit Account No. 01-2135 (referencing Case No. 501.37977CX3).

Respectfully submitted,



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Facsimile 703-312-6666

ATTACHMENTS:
Form PTO-1449
JP 10-108133
English Language Abstract



#5/B2615
1-13-04
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501.37977CX3/219900637US04

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Masaru TAKAHASHI *et al.*
Serial No. : 10/191,504
Filed : 10 July 2002
For : RECORDING MEDIUM
Art Unit : 2615
Examiner : V.F. Boccio
Conf. No. : 7116

RECEIVED

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Technology Center 2600

AMENDMENT

Commissioner for Patents
POB 1450
Alexandria, Virginia 22313-1450

29 December 2003

Sir:

In response to the Office Action mailed 26 September 2003 in connection with the above-identified application, the following amendments and remarks are respectfully submitted.

In accordance with the revised format of the manner of making amendments under 37 CFR §1.121 as set forth in the Final Rule effective 30 July 2003, each section of amendment herein begins on a new page, and changes are shown by strike-through (or double brackets where appropriate) and underlining to indicate deletions and additions, respectively. A complete listing of all claims ever presented in the application is given with the current status of each claim, and only the text of all pending and withdrawn claims is presented in full, with those not being amended herein being presented in clean version.

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172.00 DP

IN THE CLAIMS:

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1. (Currently Amended) A recording medium for recording thereon:
a first still picture ~~moving pictures~~ encoded by a first encoding method;
~~first pictures corresponding to said moving pictures, which have pixels smaller~~
~~than said moving pictures;~~
a second still picture ~~pictures~~ encoded by a second encoding method; and
a picture ~~second pictures~~ corresponding to said first and second still pictures,
which has a smaller number of ~~have~~ pixels ~~smaller~~ than said first and second still
pictures,
wherein said first still picture, said second still picture and said picture
represent the same object.

2. (Currently Amended) A recording medium in accordance with claim 1,
wherein said first still picture ~~is moving pictures~~ ~~are~~ encoded by the MPEG standard
as the first encoding method, and said second still picture ~~is still pictures~~ ~~are~~
encoded by the JPEG standard as the second encoding method.

3. (New) A video reproducing method, comprising:
reproducing at least a first still picture, a second still picture and a picture from
a recording medium, wherein said first still picture is encoded by a first encoding
method, said second still picture is encoded by a second encoding method and said
picture corresponds to said first and second still pictures and has a smaller number
of pixels than said first and second still pictures, and wherein said first still picture,
said second still picture and said picture represent the same object;

B' *cont*
outputting a plurality of pictures from the reproducing operation; and
outputting said first still picture corresponding to a selected picture.

4. (New) A video reproducing method in accordance with claim 3, wherein
said first encoding method is the MPEG standard and said second encoding method
is the JPEG standard.

5. (New) A video reproducing method, comprising:
reproducing at least a first still picture, a second still picture and a picture
recorded on a recording medium, wherein said first still picture is encoded by a first
encoding method, said second still picture is encoded by a second encoding method,
and said picture corresponds to said first and second still pictures and has a smaller
number of pixels than said first and second still pictures, and wherein said first still
picture, said second still picture and said picture represent a same object;
displaying a plurality of pictures from the reproducing operation; and
displaying said first still picture corresponding to a selected picture.

6. (New) A video reproducing method in accordance with claim 5, wherein
said first encoding method is the MPEG standard and said second encoding
method is the JPEG standard.

7. (New) A video reproducing apparatus, comprising:
reproducing means for reproducing at least a first still picture, a second still
picture and a picture from a recording medium, wherein said first still picture is

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encoded by a first encoding method, said second still picture is encoded by a second encoding method, and said picture corresponds to said first and second still pictures and has a smaller number of pixels than said first and second still pictures, and wherein said first still picture, said second still picture and said picture represent the same object;

first outputting means for outputting a plurality of reproduced pictures from the reproducing operation; and

second outputting means for outputting said first still picture corresponding to a selected picture.

8. (New) A video reproducing apparatus in accordance with claim 7, wherein said first encoding method is the MPEG standard and said second encoding method is the JPEG standard.

9. (New) A video reproducing apparatus, comprising:

reproducing means for reproducing at least a first still picture, a second still picture and a picture from a recording medium, wherein said first still picture is encoded by a first encoding method, said second still picture is encoded by a second encoding method, and said picture corresponds to said first and second still pictures and has a smaller number of pixels than said first and second still pictures, and wherein said first still picture, said second still picture and said picture represent the same object; and

displaying means for displaying at least one of said first still picture, said second still picture and said first picture;

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cont

wherein said displaying means displays a plurality of reproduced pictures from the reproducing means, and wherein said displaying means displays said first still picture corresponding to a selected picture.

10. (New) A video reproducing method in accordance with claim 9, wherein said first encoding method is the MPEG standard and said second encoding method is the JPEG standard.

11. (New) A recording medium in accordance with claim 1, wherein said first encoding method is according to a first encoding standard and said second encoding method is according to a second encoding standard.

12. (New) A video reproducing method in accordance with claim 3, wherein said first encoding method is according to a first encoding standard and said second encoding method is according to a second encoding standard.

13. (New) A video reproducing method in accordance with claim 5, wherein said first encoding method is according to a first encoding standard and said second encoding method is according to a second encoding standard.

14. (New) A video reproducing method in accordance with claim 7, wherein said first encoding method is according to a first encoding standard and said second encoding method is according to a second encoding standard.

TAKAHASHI *et al.*, SN 10/191,504
Amdt dated 12/29/2003
Reply to OA mailed 09/26/2003

Dkt. 501.37977CX3/219900637US04
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15. (New) A video reproducing method in accordance with claim 9, wherein
said first encoding method is according to a first encoding standard and said second
encoding method is according to a second encoding standard.

REMARKS

This Amendment is responsive to the Office Action identified above, and is further responsive in any other manner indicated below.

PENDING CLAIMS

Claims 1 and 2 were pending in the application at the time of the Office Action. Unrelated to any prior art, scope or rejection, appropriate Claims have been amended or added in order to adjust a clarity and/or focus of Applicant's claimed invention. That is, the amendments to the claims are unrelated to any prior art or scope adjustment, and are simply clarified claims in which Applicant is presently interested. At entry of this paper, Claims 1-15 now are pending in the application for consideration and examination.

35 USC §101 REJECTION - TRAVERSED

Claim 1 has been rejected under 35 USC §101 as being allegedly directed to non-statutory subject matter, *i.e.*, for the concerns listed within Item 2 beginning on page 2 of the Office Action.

Applicant respectfully traverses the rejection.

More particularly, Claim 1 definitely and easily meets §101 statutory subject matter requirements, as Claim 1 recites a physical object (*i.e.*, a recording medium), and such object has utility. As stated in MPEP §2107 entitled "General Principles Governing Utility Rejections":

[T]o violate [35 USC] 101 the claimed invention must be totally incapable of achieving a useful result. . . A small degree of utility is sufficient. . . The claimed invention must only be capable of performing some beneficial function. . . An invention does not lack utility merely because the particular embodiment disclosed in the patent lacks perfection or performs crudely. . . A commercially successful product is not required. . . Nor is it essential that the invention accomplish all its intended function. . . or operate under all conditions. . . partial success being sufficient to demonstrate patentable utility. . . In short, the defense of non-utility cannot be sustained without proof of total incapacity. If an invention is only partially successful in achieving a useful result, a rejection of the claimed invention as a whole based on a lack of utility is not appropriate.

Applicant respectfully submits that the recording medium of Claim 1 easily satisfies utility requirements by storing picture information.

It appears that the rejection may stem from an Examiner's preference to have Claim 1 recite more of a picture-type claim, wherein further features/limitations are included within the claim. However, it is respectfully submitted that a picture-type claim is not required under US patent law, *i.e.*, all that is required is that sufficient features/limitations are recited to distinguish over the art. Applicant's Claim 1 contains sufficient features/limitations to distinguish, as set forth in arguments given further ahead.

Based upon the foregoing, reconsideration and withdrawal of the §101 rejection of Claim 1 are respectfully requested.

DOUBLE PATENTING REJECTION - STATUTORY DISCLAIMER FILED

The obviousness-type double patenting rejection of Claims 1 and 2 as set forth at Item 4 beginning on page 3 of the Office Action is respectfully traversed. However, in order to travel a path of least resistance in obtaining a patent on the

present application, submitted herewith is an executed Statutory Disclaimer to overcome the non-statutory double patenting rejection. As a result of the attached, reconsideration and withdrawal of the double patenting rejection of the subject claims are respectfully requested.

The above statements and the filing of any Statutory Disclaimer should not be taken as an indication or admission that the rejection was valid, but is merely use of a procedural approach to obtain a patent (without prejudice or disclaimer) as quickly as possible, given that the present application's patent will likely have coextensive term with the prior patent as measured from the same original filing date, regardless of the Statutory Disclaimer. Further discussions/arguments concerning such rejection(s), claims and/or reference are left for the future if/when appropriate.

REJECTION UNDER 35 USC §103

The 35 USC §103 rejection of Claims 1 and 2 as being unpatentable over Abe *et al.* (US 6,356,709 B1) in view of Anderson (US 6,512,548 B1) is respectfully traversed. Such rejection has been rendered obsolete by the present clarifying amendments to Applicant's claims, and accordingly, traversal arguments are not appropriate at this time. However, Applicant respectfully submits the following to preclude renewal of any such rejections against Applicant's clarified claims.

All descriptions of Applicant's disclosed and claimed invention, and all descriptions and rebuttal arguments regarding the applied prior art, as previously submitted by Applicant in any form, are repeated and incorporated herein by reference. Further, all Office Action statements regarding the prior art rejections are

respectfully traversed. As additional arguments, Applicant respectfully submits the following.

Applicant's disclosed and claimed invention is directed to improved picture storing arrangements. More particularly, Applicant's disclosed and claimed invention (e.g., clarified Claim 1) includes the features/limitations of: a first still picture encoded by a first encoding method; a second still picture encoded by a second encoding method; and a picture corresponding to said first and second still pictures, which has a smaller number of pixels than said first and second still pictures, wherein said first still picture, said second still picture and said picture represent the same object. Claim 2, for example, recites the features/limitations: wherein said first still picture is encoded by the MPEG standard as the first encoding method, and said second still picture is encoded by the JPEG standard as the second encoding method. Accordingly, Applicant's two highest resolution pictures are encoded according to differing standards, e.g., MPEG and JPEG. The other ones of Applicant's claims have similar or analogous features/limitations.

The applied references, taken alone, or in combination, would not have disclosed, resulted in, or suggested such arrangements. More particularly, in order to properly support a §103 obviousness-type rejection, the reference not only must suggest the claimed features, but also must itself contain the motivation for modifying the art to arrive at an approximation of the claimed features. However, the cited art does not adequately support a §103 obviousness-type rejection because it does not, at minimum, disclose (or suggest) the limitations of Applicant's clarified claims.

Applying the above to the primary reference, Abe *et al.* basically teaches arrangements for the recording of moving pictures or still pictures. More particularly,

switch 13 is selected one way or the other to change over a compression parameter for a moving or still picture, respectively.

Anderson, as a secondary reference, teaches arrangements for allowing both a "live view" and an "instant review" capability. In order to accomplish the same, Anderson appears to redundantly store "image data", "scrennail" and "thumbnail" images of differing resolutions (*i.e.*, high, medium and low, respectively).

Turing now to compatibility between the applied references, it is respectfully submitted that Abe *et al.* and Anderson are not suitable for §103 combination. More particularly, Abe *et al.* teaches that ONLY ONE TYPE of image (*i.e.*, moving OR still) should be recorded at any given time. Hence, Abe *et al.*'s switch 13 for changing over. More specifically, column 1, lines 60-65 in Abe *et al.* teach that redundant storage of differing types of pictures results in the recording capacity of the recording medium being "not utilized effectively." Hence, Abe *et al.* actually teaches away from the device of Anderson, which redundantly stores "image data," "scrennail" and "thumbnail" images of differing resolutions. Hence, the applied references would not combine to disclose (or suggest) the present invention, since each teaches away from the other.

In addition to the foregoing, the following additional remarks from Applicant's foreign representative also are submitted in support of traversal of the rejection and patentability of Applicant's claims.

Abe *et al.* solely teaches recording moving images and wherein a still image can be taken during the recording of moving images. On the other hand, Applicant's clarified Claims 1 and 2 don't have a "moving image" capability. Therefore, Claims 1 and 2 are clearly different from the disclosure of Abe *et al.*

Furthermore, Anderson solely teaches recording still images, and two kinds of pictures, such as scrennails and thumbnails. Applicant respectfully compares clarified Claims 1 and 2, and Anderson, as follows.

Claims 1 and 2	Anderson (see Fig. 5)
First still picture (MPEG)	X (no disclosure)
Second still picture (JPEG)	Compressed image data
A picture	Thumbnail
X (no disclosure)	Scrennail

It is clear that Anderson doesn't disclose Applicant's "first still picture". Therefore, clarified Claims 1 and 2 are clearly different from Anderson.

As a result of all of the foregoing, it is respectfully submitted that the applied art (taken alone and in the Office Action combinations) would not support a §103 obviousness-type rejection of Applicant's claims. Accordingly, reconsideration and withdrawal of such §103 rejection, and express written allowance of all of the §103 rejected claims, are respectfully requested.

SPECIFIC TRAVERSAL OF "OFFICIAL NOTICE"

Office Action comments in support of the art rejection(s) assert numerous times that certain claimed features were well known in the art, *i.e.*, without providing supportive art references for such assertion. With regard to such assertion of apparent judicial (*i.e.*, Examiner) notice of common knowledge or well-known prior art, attention is directed to MPEP §2144.03 which states, "If the applicant traverses such an assertion the examiner should cite a reference in support of his or her position." Accordingly, in view of Applicant's traversal in this regard, and in accordance with the provisions of MPEP §2144.03, Applicant respectfully requests

that a documentary proof be cited to explicitly show that such features were explicitly known in the art, or alternatively, Applicant respectfully requests withdrawal of all rejections based upon such unsupported judicial notice.

RESERVATION OF RIGHTS

It is respectfully submitted that any and all claim amendments and/or cancellations submitted within this paper and throughout prosecution of the present application are without prejudice or disclaimer of any scope or subject matter. Further, Applicant respectfully reserves all rights to file subsequent related application(s) (including reissue applications) directed to any/all previously claimed limitations/features which have been subsequently amended or cancelled, or to any/all limitations/features not yet claimed, *i.e.*, Applicant continues (indefinitely) to maintain no intention or desire to dedicate or surrender any limitations/features of subject matter of the present application to the public.

EXAMINER INVITED TO TELEPHONE

The Examiner is invited to telephone the undersigned at the local D.C. area telephone 703-312-6600, to discuss an Examiner's Amendment or other suggested action for accelerating prosecution and moving the present application to allowance.

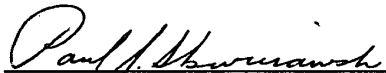
CONCLUSION

In view of the foregoing amendments and remarks, Applicant respectfully submits that the claims listed above as presently being under consideration in the

application are in condition for allowance. Accordingly, early allowance of such claims is respectfully requested.

This Amendment is being submitted within the shortened statutory period for response set by the Office Action mailed 26 September 2003 (26 December 2003 being a federal holiday in the District of Columbia, 27 December 2003 being a Saturday, and 28 December 2003 being a Sunday). Therefore, no Petition or fee is required. To whatever other extent is actually appropriate, Applicant respectfully petitions the Commissioner for an extension of time under 37 CFR §1.136. A Form PTO-2038 submitted concurrently herewith includes authorization for payment of the requisite claim fees for entry of this paper. Please charge any actual shortage in fees due to ATS&K Deposit Account No. 01-2135 (referencing Case No. 501.37977CX3).

Respectfully submitted,



Paul J. Skwierawski
Registration No. 32,173
ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 North Seventeenth Street, Suite 1800
Arlington, Virginia 22209-3801, USA
Telephone 703-312-6600
Facsimile 703-312-6666

ATTACHMENTS:
Statutory Disclaimer
Form PTO-2038 (Fee Codes 1201/1814)
Associate Power of Attorney

5 1/2

501.37977CX3/219900637US04

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Masaru TAKAHASHI *et al.*
Serial No. : 10/191,504
Filed : 10 July 2002
For : METHOD AND APPARATUS FOR RECORDING AND
REPRODUCING VIDEO DATA, AND RECORDING MEDIUM
Art Unit : 2615
Examiner : V.F. Boccio
Conf. No. : 7116

RECEIVED

JAN 07 2004

Technology Center 2600

ASSOCIATE POWER OF ATTORNEY

Commissioner for Patents
POB 1450
Alexandria, Virginia 22313-1450

29 December 2003

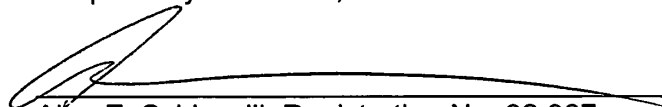
Sir:

The undersigned, as a principal attorney of record in the above-identified application, hereby appoints Paul J. Skwierawski, Reg. No. 32,173, as associate attorney of record, to prosecute and transact all business connected with this application and any related U.S./international application.

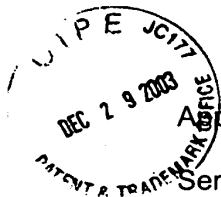
Please continue to direct all correspondence regarding this case to:

**ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 North Seventeenth Street, Suite 1800
Arlington, Virginia 22209-3801, USA
Telephone 703-312-6600
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Respectfully submitted,


Alan E. Schiavelli, Registration No. 32,087
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Facsimile 703-312-6666

Practitioner's Docket No. 501.37977CX3/219900637US04



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Masaru TAKAHASHI *et al.*
Serial No. : 10/191,504
Filed : 10 July 2002
For : RECORDING MEDIUM
Art Unit : 2615
Examiner : V.F. Boccio
Conf. No. : 7116

#6
~~113-09~~
K. Wind
1/14/04
#6 Terminal
Disclaimer

**STATUTORY DISCLAIMER TO OBVIATE
A DOUBLE-PATENTING REJECTION (37 C.F.R. Section 1.321(c))**

Commissioner for Patents
POB 1450
Alexandria, Virginia 22313-1450

29 December 2003

Sir:

IDENTIFICATION OF PERSON MAKING THIS DISCLAIMER

I, Paul J. SKWIERAWSKI, represent that I am an attorney of record.

EXTENT OF DISCLAIMANT'S INTEREST

The extent of the interest in this invention that the Disclaimant owns is in the whole of this invention, by virtue of the Assignment recorded 21 December 1999 at Reel 010592, Frames 0917 *et seq.* in Serial No. 09/4456,338 (now US 6,424,795 B1), upon which benefit is claimed in the present case under 35 USC §120.

**DISCLAIMER
(Obviousness-Type Double Patenting Rejection Over A Prior Patent)**

HITACHI, LTD. ("Disclaimant") hereby disclaims except as provided below, the terminal part of any patent granted on the instant application which would extend beyond the expiration date of US 6,424,795 B1, as presently shortened by any Statutory Disclaimer.

01/06/2004 KBETENAI 00000029 10191504

01 FC:1814

118.00 OP

Disclaimant hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the above-listed patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors, or assigns.

In making the above disclaimer, Disclaimant does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term as defined in 35 USC Sections 154 to 156 and 173 of the patent forming the basis of the double patenting rejection, namely, US 6,424,795 B1 as presently shortened by any Statutory Disclaimer, in the event that it later: expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR §1.321, has all claims cancelled by a Re-Examination Certificate, is reissued, or is in any manner terminated prior to expiration of its full statutory term as presently shortened by any Statutory Disclaimer, except for the separation of legal title stated above.

DISCLAIMER FEE (37 C.F.R. Section 1.20(d))

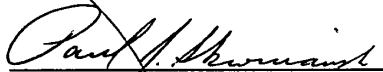
Other than a small entity--fee \$110.00 (Fee Code 1814).

FEE PAYMENT

Attached is a Form PTO-2038 (Credit Card Payment) authorizing payment of the sum of \$110.00.

Charge ATSK Deposit Account No. 01-2135 for any fee deficiency.

Date: 29 December 2003



Paul J. Skwierawski
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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/191,504	07/10/2002	Masaru Takahashi	501.37977CX3	7116

20457 7590 09/26/2003

ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 NORTH SEVENTEENTH STREET
SUITE 1800
ARLINGTON, VA 22209-9889

EXAMINER

BOCCIO, VINCENT F

ART UNIT	PAPER NUMBER
----------	--------------

2615

DATE MAILED: 09/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/191,504

Applicant(s)

TAKAHASHI ET AL.

Examiner

Vincent F. Boccio

Art Unit

2615

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1 and 2 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☐ Claim(s) 1 and 2 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3. 6) ☐ Other: _____.

DETAILED ACTION

The Group and/or Art Unit location of your application in the PTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Group Art Unit 2615.

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:
Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.
2. Claim 1 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 1 which recites,

"a recording medium for recording thereon:

moving pictures encoded by a first encoding method

first pictures corresponding to said moving pictures, which have pixels smaller than said moving pictures;

still pictures encoded by a second encoding method; and

second pictures corresponding to said still pictures, which have pixels smaller than the still picture"

the claims fails to recite any functional descriptive material recorded on the medium with the moving or still images or any linking information between,

therefore the medium merely is for recording the moving and still images, therefore the claims recite no distinct or specific structure or format and therefore are not directed toward

statutory subject matter.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969). A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR

1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1-2 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 3 of U.S. Patent No. 6,424,795. Although the conflicting claims are not identical, they are not patentably distinct from each other because see below.

Application claim 1, a medium having moving pictures with corresponding first pictures, still pictures with corresponding second pictures, wherein between the moving and the first the first having pixels smaller,

wherein between the still and second, the second having pixels smaller,

wherein patented claim 3, recites,

having moving with corresponding stills, wherein the moving and stills utilize the same encoding method, and wherein

the still pictures are encoded fine video signals when recording stills, therefore corresponding,

further recording other still images, but, the patented claims fails to particularly disclose,

recording corresponding to other stills or second with pixels smaller, than the other stills using the same encoding method.

The examiner takes official notice that encoding corresponding stills with respect to the other stills using the same encoding method, even with smaller pixels smaller is obvious, and wherein the corresponding stills with respect to moving that use the same encoding method, to also with smaller pixels, as is well known (reference art rejection below), therefore it would have been obvious to one skilled in the art to further recite, having stills corresponding to other stills, being smaller pixels, and wherein the still picture corresponding to the moving can have smaller pixels, as is obvious and well known to those skilled in the art.

Regarding claim 2, the patented claims recite wherein the

moving and stills utilize the same encoding method but fail to disclose the utilization of MPEG, further wherein the other and corresponding stills utilize JPEG.

The examiner takes official notice, that it is well known to generate moving with MPEG and corresponding stills and further to generate other images with corresponding images with JPEG, therefore it would have been obvious to one skilled in the art at the time of the invention to incorporate JPEG for the stills and MPEG for moving and corresponding still images, as is well

Allowance of claims 1-2 of the instant application would result in a time-wise extension of the monopoly previously granted for the invention defined by patent claim(s), therefore, obviousness type double patenting is deemed proper.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).
6. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Abe et al. (US 6,356,709) taken with Anderson (US 6,512,548).

Regarding claims 1-2, Abe teaches recording moving images and wherein a still image can be taken during the recording of moving images (col. 10, lines 37-52), wherein the still and moving images are encoded with the same encoding method (col. 2, lines 4-12), further wherein still picture are compressed to a smaller compression ratio (col. 5, lines 23-), but fails to particularly disclose wherein the still picture images having a smaller pixels.

The examiner takes official notice that by increasing the number of pixels per area of an image when taken, provides for more information and a higher resolution image, thereby increasing the size of the image file, but, providing a higher resolution image.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to modify Abe by incorporating capturing and encoding more pixels per image, than in the moving mode to provide higher resolution images, as is obvious to those skilled in the art.

Anderson teaches providing a device for capturing images of a resolution of 640 x 480 (col. 6, lines 8-10), and further generating additional images corresponding to the still images, such as screen-nails (col. 6, lines 33-34) and thumbnails,

Serial Number: 10/191,504
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Page 7

wherein the screen nails are 288 x 216, and are optionally compressed (col. 6, lines 17-29) and stored or recorded to a medium (Fig. 5), which the preferred compression format is JPEG (col. 6, lines 2-3).

Since, Abe teach that the recited video and associated first pictures, wherein the first having smaller pixels or higher resolution can be obviously generated to a medium; and

Anderson teaches in Fig. 1, a computer imaging system which generated second pictures and still pictures, wherein the stills are encoded with a lower pixel amount or smaller number of pixels to a medium, it would have been obvious to one skilled in the art that these generated images can be stored on a medium together from more than one system, such as system as taught by Abe and Anderson, for example in an editing environment to store images taken from systems of Abe and Anderson, as is considered obvious to one skilled in the art.

Contact Fax Information

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703) 872-9314, (for formal communication intended for entry)

or:

(703) 308-5359, (for informal or draft communications, please label "PROPOSED" or "DRAFT")
Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Serial Number: 10/191,504
Art Unit: 2615

Page 8

Contact Information

7. Any inquiry concerning this communication or earlier communications should be directed to the examiner of record, Monday-Thursday, 8:00 AM to 5:00 PM Vincent F. Boccio (703) 306-3022.

If any attempts to reach the examiner by telephone are unsuccessful, the examiners supervisor, Andy Christensen (703) 308-9644.

Any inquiry of a general nature or relating to the status of this application should be directed to Customer Service (703) 306-0377.

Primary Examiner, Boccio, Vin
September 22, 2003


VINCENT BOCCIO
PRIMARY EXAMINER

Notice of References Cited	Application/Control No. 10/191,504	Applicant(s)/Patent Under Reexamination TAKAHASHI ET AL.	
	Examiner Vincent F. Boccio	Art Unit 2615	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-6,512,548	01-2003	Anderson, Eric C.	348/333.05
	B	US-6,424,795	07-2002	Takahashi et al.	386/120
	C	US-6,356,709	03-2002	Abe et al.	386/117
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

#3

Form PTO-1449
Equivalent

U.S. Department of Commerce
Patent and Trademark Office

Atty. Docket No. 501.37977CX3
Serial No. (not yet assigned)
Applicant: M. TAKAHASHI et al
Filing Date: July 10, 2002
Group:

U.S. Patent Documents

Examiner Initials	Document No.	Date	Name	Class Subclass	Filing Date If Approp.
<u>VPS</u>	4,691,253	9/87	Silver		
<u>VPS</u>	5,138,459	8/92	Roberts et al		
<u>VPS</u>	5,444,482	8/95	Misawa et al		
<u>VPS</u>	5,987,179	11/99	Riek et al		
<u>VPS</u>	6,195,503	2/01	Ikedo et al		
<u>VPS</u>	6,226,449	5/01	Inoue et al		
<u>VPS</u>	6,300,976	10/01	Fukuoka		

J1080 U.S. PTO
10/19/04
07/10/02

Foreign Patent Documents

Document No.	Date	Country	Class Subclass	Translation Yes No
<u>VPS</u> WO 92/09169	1992	PCT		
<u>VPS</u> 7-212712	1995	Japan		
<u>VPS</u> 7-327196	1995	Japan		
<u>VPS</u> 10-108121	1998	Japan		
<u>VPS</u> 10-108133	1998	Japan		
<u>VPS</u> 10-200859	1998	Japan		
<u>VPS</u> 10-233995	1998	Japan		

Other Documents (including Author, Title, Date, Pertinent Pages, etc.)

VPS HDTV MPEG2, pp. 128-164

Examiner

Vincent Boer

Date Considered

9/10/02

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

10/19/02 10/19/02

Please type a plus sign (+) inside this box →



PTO/SB/05 (03-01)

Approved for use through 10/31/2002 OMB 0651-0032

U.S. Patent and Trademark Office U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

UTILITY PATENT APPLICATION TRANSMITTAL		Attorney Docket No. 501.37977CX3	
		First Inventor TAKAHASHI, MASARU	
		Title METHOD AND APPRATUS FOR RECORDING AND REPRODUCING VIDEO DATA, AND RECORDING MEDIUM	
		Express Mail Label No. 	
(Only for new nonprovisional applications under 37 CFR 1.53(b))			
APPLICATION ELEMENTS		ADDRESS TO:	
SEE MPEP chapter 600 concerning utility patent application contents.		Assistant Commissioner for Patents Box Patent Application Washington, DC 20231	
1. ☒ Fee Transmittal Form (e.g., PTO/SB/17) (Submit an original and a duplicate for fee processing)		7. ☐ CD-ROM or CD-R in duplicate, large table or Computer Program (Appendix)	
2. ☐ Applicant claims small entity status See 37 CFR 1.27		8. Nucleotide and/or Amino Acid Sequence Submission <i>if applicable, all necessary</i>	
3. ☒ Specification [Total Pages: 40] (perform arrangement set forth below)		a. ☐ Computer Readable Form (CRF)	
-Descriptive title of the invention -Cross Reference to Related Applications -Statement Regarding Fed sponsored R & D -Reference to sequence listing, a table, or a computer program listing appendix -Background of the Invention -Brief Summary of the Invention -Brief Description of the Drawings (if filed) -Detailed Description -Claim(s) -Abstract of the Disclosure		b. Specification Sequence Listing on	
4. ☒ Drawing(s) (35 U.S.C. 113) [Total Pages: 3]		i. ☐ CD-ROM or CD-R (2 copies), or	
5. Oath or Declaration [Total Pages: 2]		ii. ☐ paper	
a. ☐ Newly executed (original or copy)		c. ☐ Statements verifying identity of above copies	
b. ☒ Copy from a prior application (37 CFR 1.63(d)) (for continuation/divisional with Box 18 completed)			
i. ☐ DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) Named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b)			
6. ☐ Application Data Sheet See 37 CFR 1.76			
ACCOMPANYING APPLICATION PARTS			
9. ☐ Assignment Papers (cover sheet & documents(s))			
10. ☐ 37 CFR 3.73(b) Statement ☐ Power of Attorney (when there is an assignee)			
11. ☐ English Translation Document (if applicable)			
12. ☒ Information Disclosure Statement (IDS)/PTO-1449 ☐ Copies of IDS Citations			
13. ☒ Preliminary Amendment			
14. ☒ Return Receipt Postcard (MPEP 503) (Should be specifically itemized)			
15. ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed)			
16. ☐ Nonpublication Request under 35 U.S.C. 122 (b)(2)(B)(i) Applicant must attach form PTO/SB/35 or its equivalent			
17. ☐ Other			
18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment, or in an Application Data Sheet under 37 CFR 1.76: ☒ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No 09/446,338			
Prior application information Examiner: V. Boccia Group Art Unit: 2615 For CONTINUATION OR DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 5b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.			
19. CORRESPONDENCE ADDRESS			
☒ Customer Number or Bar Code Label		020457 (Insert Customer No. or Attach bar code label here)	
		or ☐ Correspondence address below	
Name ANTONELLI, TERRY, STOUT & KRAUS, LLP			
Address			
City		State	Zip Code
Country		Telephone (703) 312-6600	Fax (703) 312-6666
Name Melvin Kraus		Registration No. (Attorney/Agent) 22,466	
Signature <i>Melvin Kraus</i>		Date JULY 10, 2002	

Burden Hour Statement: This form is estimated to take .2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Box Patent Application, Washington, DC 20231.

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1. ☒ The Commissioner is hereby authorized to charge indicated fees and credit overpayments to: Deposit Account Number 01-2135 Deposit Account Name Antonelli, Terry, Stout & Kraus, LLP ☐ Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17 ☐ Applicant Claims small entity status See 37 CFR 1.27				3. ADDITIONAL FEES <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Fee Code</th> <th>Large Entity Fee (\$)</th> <th>Small Entity Fee Code</th> <th>Small Entity Fee (\$)</th> <th>Fee Description</th> <th>Fee Paid</th> </tr> </thead> <tbody> <tr> <td>105</td> <td>130</td> <td>205</td> <td>65</td> <td>Surcharge - late filing fee or oath</td> <td></td> </tr> <tr> <td>127</td> <td>50</td> <td>227</td> <td>25</td> <td>Surcharge - late provisional filing fee or cover sheet</td> <td></td> </tr> <tr> <td>139</td> <td>130</td> <td>139</td> <td>130</td> <td>Non-English specification</td> <td></td> </tr> <tr> <td>147</td> <td>2,520</td> <td>147</td> <td>2,520</td> <td>For filing a request for <i>ex parte</i> reexamination</td> <td></td> </tr> <tr> <td>112</td> <td>920*</td> <td>112</td> <td>920*</td> <td>Requesting publication of SIR prior to Examination action</td> <td></td> </tr> <tr> <td>113</td> <td>1,840*</td> <td>113</td> <td>1,840*</td> <td>Requesting publication of SIR after Examiner action</td> <td></td> </tr> <tr> <td>115</td> <td>110</td> <td>215</td> <td>55</td> <td>Extension for reply within first month</td> <td></td> </tr> <tr> <td>116</td> <td>400</td> <td>216</td> <td>200</td> <td>Extension for reply within second month</td> <td></td> </tr> <tr> <td>117</td> <td>920</td> <td>217</td> <td>460</td> <td>Extension for reply within third month</td> <td></td> </tr> <tr> <td>118</td> <td>1,440</td> <td>218</td> <td>720</td> <td>Extension for reply within fourth month</td> <td></td> </tr> <tr> <td>128</td> <td>1,960</td> <td>228</td> <td>980</td> <td>Extension for reply within fifth month</td> <td></td> </tr> <tr> <td>119</td> <td>320</td> <td>219</td> <td>160</td> <td>Notice of Appeal</td> <td></td> </tr> <tr> <td>120</td> <td>320</td> <td>220</td> <td>160</td> <td>Filing a brief in support of an appeal</td> <td></td> </tr> <tr> <td>121</td> <td>280</td> <td>221</td> <td>140</td> <td>Request for oral hearing</td> <td></td> </tr> <tr> <td>138</td> <td>1,510</td> <td>138</td> <td>1,510</td> <td>Petition to institute a public use proceeding</td> <td></td> </tr> <tr> <td>140</td> <td>110</td> <td>240</td> <td>55</td> <td>Petition to revive - unavoidable</td> <td></td> </tr> <tr> <td>141</td> <td>1,280</td> <td>241</td> <td>640</td> <td>Petition to revive - unintentional</td> <td></td> </tr> <tr> <td>142</td> <td>1,280</td> <td>242</td> <td>640</td> <td>Utility issue fee (or reissue)</td> <td></td> </tr> <tr> <td>143</td> <td>460</td> <td>243</td> <td>230</td> <td>Design issue fee</td> <td></td> </tr> <tr> <td>144</td> <td>620</td> <td>244</td> <td>310</td> <td>Plant issue fee</td> <td></td> </tr> <tr> <td>122</td> <td>130</td> <td>122</td> <td>130</td> <td>Petitions to the Commissioner</td> <td></td> </tr> <tr> <td>123</td> <td>50</td> <td>123</td> <td>50</td> <td>Processing fee under 37 CFR 1.17(q)</td> <td></td> </tr> <tr> <td>126</td> <td>180</td> <td>126</td> <td>180</td> <td>Submission of Information Disclosure Stmt</td> <td></td> </tr> <tr> <td>581</td> <td>40</td> <td>581</td> <td>40</td> <td>Recording each patent assignment per property (times number of properties)</td> <td></td> </tr> <tr> <td>146</td> <td>740</td> <td>246</td> <td>370</td> <td>For each additional invention to be examined (37 CFR § 1.129(a))</td> <td></td> </tr> <tr> <td>149</td> <td>740</td> <td>249</td> <td>370</td> <td>For each additional invention to be examined (37 CFR § 1.129(b))</td> <td></td> </tr> <tr> <td>179</td> <td>740</td> <td>279</td> <td>370</td> <td>Request for Continued Examination (RCE)</td> <td></td> </tr> <tr> <td>169</td> <td>900</td> <td>169</td> <td>900</td> <td>Request for expedited examination of a design application</td> <td></td> </tr> <tr> <td colspan="6" style="padding: 5px;">Other fee (specify) _____</td> </tr> <tr> <td colspan="6" style="text-align: right; 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SUBMITTED BY		Complete (if applicable)	
Name (Print/Type) Melvin Kraus	Registration No (Attorney/Agent) 22,466	Telephone (703) 312-6600	
Signature		Date 07/10/02	

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501.37977CX3

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): M. TAKAHASHI, et al
Serial No.: (not yet assigned)
Filed: July 10, 2002
For: METHOD AND APPARATUS FOR RECORDING AND
REPRODUCING VIDEO DATA, AND RECORDING MEDIUM

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D.C. 20231

July 10, 2002

Sir:

The following preliminary amendments and remarks are respectfully submitted in connection with the above-identified application.

TITLE OF THE INVENTION:

Please change the title of the invention to:
--RECORDING MEDIUM--.

IN THE SPECIFICATION:

Page 1, between the title of the invention and the heading "FIELD OF THE INVENTION", insert the following new paragraph:

--CROSS REFERENCE TO RELATED APPLICATION:

This is a continuation of U.S. application Serial No. 09/446,338, filed December 20, 1999, the subject matter of which is incorporated by reference herein.--

REMARKS

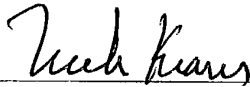
By the above amendment, the title of the invention has been changed to a title which is more clearly indicative of the invention, and the specification has been amended so as to incorporate the Cross Reference to the parent application.

Also enclosed is an Information Disclosure Statement.

Examination of the application and favorable action thereof is respectfully requested.

Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 01-2135 (501.37977CX3) and please credit any excess fees to such deposit account.

Respectfully submitted,



Melvin Kraus

Registration No. 22,466

ANTONELLI, TERRY, STOUT & KRAUS, LLP

MK/cee
(703) 312-6600

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SPECIFICATION

METHOD AND APPARATUS FOR RECORDING AND REPRODUCING
VIDEO DATA, AND RECORDING MEDIUM

FIELD OF THE INVENTION

The present invention relates to an apparatus and a method for recording moving and still pictures, and an apparatus and a method for reproducing recorded moving and still pictures, as well as a recording medium.

BACKGROUND ART

Recently, along with tendency toward large scale in capacity of recording medium such as rewritable optical disks, etc. and with improvement in techniques for compressing moving pictures, the techniques for digital cameras and recordable players, etc. that have the function of recording moving pictures on optical disks have been reviewed. Under the situation, recordings of both moving and still pictures on optical disks in a common format have coming into reality.

As such a compression method, it would be advantageous to use the MPEG (Moving Picture Expert Group) standard for recording moving pictures from the viewpoint of compression efficiency. The MPEG standard is a well-known technique

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described in, for example, "The Latest Guidebook to MPEG" (ASCII Co., Ltd., Aug. 1, 1994), etc. The detailed description for the MPEG will thus be omitted here.

As for a compression method for still pictures, the JPEG (Joint Photographic coding Experts Group) standard used for recording digital still pictures from general electronic still cameras may be replaced with another method if the method can record the data equivalent to one frame of moving pictures recorded by the MPEG as 1 picture. If the recordable player described above has a means for expanding pictures compressed by, for example, the MPEG compression method, and then both moving and still pictures can be reproduced. In this case, it is no need to use such an expanding means as JPEG for reproducing pictures, thereby the cost of the reproducing system can be reduced.

However, the data must be processed fast to encode moving pictures in real time and it is impossible to increase the number of pixels per frame of moving pictures so much. For example, the maximum number of pixels per frame is 720 in the horizontal direction and 480 in the vertical direction on the encoding level referred to as the main profile main level which handles the resolution of the present TV sets, required for the MPEG method. On the other hand, the encoding time for one sheet of still pictures is not limited so strictly, so that the number of pixels to be

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handled in accordance with the high resolution of the object photographing element can be increased. Consequently, most of the present electronic still cameras can record still pictures with the use of the JPEG compression method and the number of pixels to be handled by those cameras is being increased year after year.

In order to enable any reproducing apparatus such as recordable players and ordinary players to reproduce data on the basis of the MPEG, as well as record high resolution still pictures, it is only needed to record both MPEG I pictures and JPEG file pictures. Such techniques are disclosed in, for example, the Japanese Patent Unexamined Publication No.10-108133. According to the disclosed techniques, pictures is encoded and recorded with a plurality of different methods at a time and both moving and still pictures are encoded and recorded simultaneously. The conventional techniques, however, do not consider encoding of still pictures read from a fine photographing element with the use of such an encoding method as MPEG for moving pictures. In particular, no care is paid for the difference in reading pictures from a photographing element between reading fine still pictures and reading moving pictures.

Furthermore, the above conventional techniques do not consider any correspondence to recordings of both moving and still pictures, although they can record both encoded still

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pictures and partial still pictures so as to make it easier for an user to control the apparatus, for example, for searching pictures when in reproducing.

DISCLOSURE OF THE INVENTION

Generally, the number of pixels to be read from a photographing element within a unit time is limited. The number of pixels to be read per frame of moving pictures therefore is also limited. On the other hand, a long time can be spared to read a large number of pixels from still pictures slowly. Consequently, if an apparatus that employs a fine photographing element is used to record fine still pictures, a sheet of pictures is read by spending a time required for reading one or more frames. The reading method thus comes to differ between moving picture and still pictures.

Under the circumstances, it is the first object of the present invention to provide an apparatus and a method for recording pictures, which are preferred to solve the above conventional problems and enable recordable players and other ordinary players which reproduce moving pictures to reproduce and record fine still pictures, as well.

It is the second object of the present invention to provide an apparatus and a method for recording pictures, which is more improved in controlling such reproducing

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operations as searching even when in recording both moving and still pictures, as well as a recording medium in which pictures are recorded as described above.

Furthermore, it is the third object of the present invention to provide an apparatus and a method for reproducing both moving and still pictures, which can reproduce the recording medium on which pictures are recorded with the use of the recording apparatus and the recording method described above, as well as improved more in controlling such reproducing operations as searching and composed simply.

In order to achieve the first object, the recording method of the present invention used for a video recording apparatus that can record both moving and still pictures on a recording medium includes steps for recording moving pictures encoded with the use of the first encoding method when in recording moving pictures; and for recording still pictures encoded with the use of the second encoding method and other still pictures encoded by the first encoding method from single frame signals obtained from the still pictures when in recording still pictures. Furthermore, the video recording apparatus of the present invention comprises optical focusing means composed of an optical lens system; photoelectric converting means for converting pictures focused by the optical focusing means to electric

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signals; signal processing means for converting electric signals converted by the photoelectric converting means to video signals; driving means provided with two modes (moving picture photographing mode and still picture photographing mode) so as to drive reading of electric signals from the photoelectric converting means so that the video signals are converted to predetermined moving picture signals in the moving photographing mode and drive reading of electric signals from the photoelectric converting means so that the video signals are converted to video signals finer than the moving picture signals in the still picture photographing mode; signal converting means for converting the signal format of fine video signals in the still picture photographing mode to the same format as that of single frame moving picture signals in the moving picture photographing mode; moving picture encoding means for encoding moving picture signals output from the signal processing means with the use of the first encoding method in the moving picture photographing mode and encoding single frame signals output from the signal converting means with the use of the first encoding method in the still picture photographing mode; still picture encoding means for encoding fine video signals with the use of the second encoding method in the still picture photographing mode; recording controlling means for controlling a recording medium for recording encoded moving

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and still pictures and recording of moving and still pictures on the recording medium; system controlling means for controlling each of the above means one-dimensionally; and selecting means for selecting one of the recording modes. The recording apparatus can thus record moving images encoded by the moving encoding means when in recording moving pictures and record still pictures encoded by the still picture encoding means, as well as other still pictures encoded by the moving encoding means from single frame signals obtained from the still pictures when in recording still pictures.

The video recording apparatus of the present invention further includes moving picture storing means for storing single frame signals output from the signal converting means in the still picture photographing mode; and still picture storing means for storing fine video signals so that the recording apparatus records moving pictures by reading moving picture signals from the moving picture storing means and encoding them with the use of the moving picture encoding means when in recording moving pictures and records still pictures by reading still pictures from the fine still picture storing means and encoding them with the use of the still picture encoding means when in recording still pictures, and also records fine video signals read from the moving picture storing

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means and encoded by the moving picture encoding means. The fine video signals are stored once in the still picture storing means before they are converted to single frame signals by the signal converting means, then stored in the moving picture storing means.

In order to achieve the second object of the present invention, the present invention provides a recording method characterized in that when in recording moving pictures, moving pictures are recorded together with a still picture obtained by compressing signals of a frame representing the moving pictures to record and when in recording still pictures, compressed still pictures are also recorded together with non-compressed still pictures. The recording method also employs screen compressing means for compressing the screen of pictures of a frame representing the moving picture signals to record when in recording moving pictures and compressing the screen of still pictures to record when in recording still pictures, so that when in recording of moving pictures, moving pictures encoded by the moving encoding means are recorded together with still pictures whose screen is compressed by the screen compressing means and when in recording of still pictures, still pictures encoded by the still picture encoding means are recorded together with other still pictures encoded by the moving encoding means from single

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frame signals obtained from the still pictures, and further other still pictures whose screen is compressed by the screen compressing means.

Furthermore, the present invention provides the recording method characterized in that when in recording of moving pictures, moving pictures are recorded together with a still picture obtained by compressing the signals of a frame representing the moving pictures to record and when in recording of still pictures, still pictures obtained by compressing the single frame signals to be encoded by the first encoding method is also recorded. The video recording apparatus further includes screen compressing means for compressing the screen of pictures of a frame representing moving picture signals to record when in recording moving pictures and compressing the screen of single frame signals obtained from the still pictures when in recording still pictures, so that when in recording moving pictures, the moving pictures encoded by the moving picture encoding means are recorded together with the still pictures whose screen is compressed by the screen compressing means and when in recording still pictures, the still pictures encoded by the still picture encoding means are recorded together with still pictures encoded by the moving picture encoding means from single frame signals obtained from the still pictures,

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as well as other still pictures whose screen is compressed by the screen compressing means.

The present invention also provides a recording method for recording a still picture obtained by compressing signals of a frame representing the moving pictures to record when in recording moving pictures and recording either compressed still pictures or still pictures obtained by compressing single frame signals to be encoded by the first encoding method. In this case, the video recording apparatus of the present invention further includes screen compressing means for compressing the screen of pictures of a frame representing the object moving picture signals when in recording moving pictures and compressing the screen of either the still pictures or single frame signals obtained from the still pictures when in recording still pictures, so that when in recording moving pictures, moving pictures encoded by the moving picture encoding means are recorded together with still pictures whose screen is compressed by the screen compressing means and when in recording still pictures, still pictures encoded by the still picture encoding means are recorded together with other still pictures encoded by the moving picture encoding means from single frame signals obtained from the same still pictures, and further other still pictures whose screen is compressed by the screen compressing means.

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Furthermore, the present invention further provides a recording medium on which moving pictures encoded by the first encoding means are recorded together with still pictures obtained by compressing the screen of a representative one of the moving pictures, other still pictures encoded by the second encoding method, single frame moving pictures created from the still pictures encoded by the first encoding method, and further other still pictures whose screen is compressed.

In order to achieve the third object of the present invention, the present invention provides a reproducing method that can reproduce the above recording medium, wherein it is possible to reproduce and output single frame moving pictures created from the still pictures encoded by the first encoding method corresponding to the selected still picture to at least one output destination when a still picture whose screen is compressed is selected and called. In this case, the reproducing method allows a still picture corresponding to the called still picture to be output in accordance with the picture resolution of the output destination. Furthermore, the video reproducing apparatus of the present invention further includes picture selecting means for specifying one of reproduced still pictures whose screen is compressed; reproducing controlling means for controlling reproduction of single frame moving pictures

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created from still pictured encoded by the first encoding method corresponding to the selected still picture when the selected still picture is a still picture whose screen is compressed; moving picture decoding means for decoding reproduced single frame moving pictures using the first encoding method.

Furthermore, the present invention provides a reproducing method used for a video reproducing apparatus that can reproduce the above recording medium, wherein a single frame moving picture created from a still picture encoded by the first encoding method corresponding to a selected still picture is reproduced and displayed when a still picture whose screen is compressed is selected and called. In this case, the reproducing apparatus that uses the above reproducing method is further provided with picture selecting means for specifying one of reproduced still pictures whose screen is compressed; reproducing control means for reproducing single frame moving pictures created from the still pictures encoded by the first encoding means corresponding to the selected still picture when the selected still picture is a still picture whose screen is compressed; moving picture decoding means for decoding the reproduced single frame moving pictures using the first encoding method; and displaying means for displaying decoded single frame moving pictures.

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BRIEF DESCRIPTION OF THE DRAWINGS

Fig.1 is a system block diagram of a recording apparatus united with a camera in an embodiment of a video recording apparatus of the present invention.

Fig.2 is a recording format of a recording medium used for the recording apparatus united with a camera.

Fig.3 is a system block diagram of a recording apparatus united with a camera in another embodiment of the video recording apparatus of the present invention.

Fig.4 is a recording format of a recording medium used for the recording apparatus united with a camera.

Fig.5 is a system block diagram of a video reproducing apparatus in an embodiment of the present invention.

Fig.6 is a system block diagram of the video reproducing apparatus in another embodiment of the present invention.

BEST MODE FOR CARRYING OUT THE INVENTION

Hereunder, the embodiments of the present invention will be described with reference to the accompanying drawings.

<First Embodiment>

Fig.1 is a system block diagram indicating a video recording apparatus united with a camera in an embodiment

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of the present invention. In Fig.1, numeral 101 is an optical lens for focusing an object picture and 102 is a CCD sensor, which is photoelectric converting means for converting the light of focused pictures to electric signals. Numeral 103 is a signal processing unit for converting picture information converted to electric signals further to video signals and 104 is a driving unit for driving the CCD sensor. Numeral 105 is a moving picture compressing unit for compressing video signals in accordance with such an encoding standard as MPEG used for moving pictures. Numeral 106 is a fine still picture compressing unit for compressing video signals in accordance with such an encoding standard as JPEG used for fine still pictures and 107 is a moving picture memory for storing pictures temporarily when the moving picture compressing unit 105 performs a compression processing. Numeral 108 is a still picture memory for storing pictures temporarily when the fine still picture compressing unit 106 performs a compressing processing. Numeral 109 is a signal converting unit for converting the signal format of fine still signals to the same signal format as that of single frame moving picture signals. Numeral 110 is a microphone for converting collected audios to electric audio signals and 111 is an audio compressing unit for converting audio signals to digital signals and compressing predetermined

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digital audios. Numeral 112 is a multiplexing unit for multiplexing compressed moving picture streams generated in the moving picture compressing unit 105 and compressed audio streams generated in the audio compressing unit 111. Numeral 113 is a recording control unit for managing recorded data files of moving and still pictures to record and controlling the recording with the use of a predetermined file system. Numeral 114 is such a recording medium as an optical disk, etc. Numeral 115 is a system control unit for controlling the driving unit 104, the moving picture compressing unit 105, the fine still picture compressing unit 106, the moving picture memory 107, the still picture memory 108, and the recording control unit 113 one-dimensionally. Numeral 116 is a switch used by the user to select a recording mode between the moving picture photographing mode and the still picture photographing mode.

If the moving picture photographing mode is selected by the switch 116, the system control unit 115 controls the whole system as follows. The driving unit 104 drives the CCD sensor 102 to generate moving picture signals, so that the CCD sensor 102 converts the pictures focused by the optical lens 101 to electric signals. Then, the signal processing unit 103 converts the electric signals to digital signals, which become video signals. The video signals are

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then stored in the moving picture memory 107. While video signals in the compression process are transferred from the moving picture compressing unit 105 to the moving picture memory 107, the video signals are converted sequentially to compressed moving picture streams and audios collected by the microphone 110 are compressed in the audio compressing unit 111. After that, moving picture streams generated by the moving picture compressing unit 105 and compressed audio streams generated in the audio compressing unit 111 are multiplexed by the multiplexing unit 112. The multiplexed streams are recorded on the recording medium 114 via the recording control unit 113 in a predetermined recording format to be described later.

If the still picture photographing mode is selected by the switch 116, the system control unit 115 controls the whole system as follows. The driving unit 104 drives the CCD sensor 102 to generate still picture signals, so that the CCD sensor 102 converts the pictures focused by the optical lens 101 to electric signals, then the signal processing unit 103 converts the electric signals to digital signals, which become video signals. If the CCD sensor 102 is driven to generate still picture signals, fine video signals are output so that video signals for a sheet of still pictures are output in a time exceeding the one-frame period of moving picture signals. The still picture memory 108

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stores video signals equivalent to one sheet of still pictures. After that, the fine still picture compressing unit 106 compresses still pictures for one sheet stored in the still picture memory 108 and the compressed still pictures are recorded on the recording medium 114 via the recording control unit 113 as still picture file data. Then, the signal converting unit 109 converts the signal format of a sheet of pictures stored in the still picture memory 108 to the same signal format as that of single frame moving picture signals, then the converted signals are stored in the moving picture memory 107. Then, the moving picture compressing unit 105 compresses signals to MPEG I pictures, etc., then the I pictures are stored on the recording medium 114 via the recording control unit 113 as moving picture streams.

According to this embodiment, therefore, when in photographing still pictures, still pictures in the format of the compressed moving picture streams converted from fine still pictures are recorded together with a fine still picture file. Those pictures can thus be reproduced in any of recordable players and other ordinary players for reproducing moving pictures. The same pictures can also be fetched as fine still pictures so as to be handled on personal computers.

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Although signals read from the still picture memory 108 are converted in the signal converting unit 109 in this embodiment, fine video signals output from the signal processing unit 103 may also be converted directly in the signal converting unit 109. In this case, fine still picture signals and single frame moving picture image signals are stored in the still picture memory 108 and in the moving picture memory 107 simultaneously.

Furthermore, the moving picture memory 107 and the still picture memory 108 in this embodiment may be composed as different address spaces in one memory.

The signal converting unit 109 may also be composed so that the CPU obtains still pictures directly from the still picture memory 108 using a program and converts the still pictures to single frame moving pictures through an arithmetic operation, thereby writing the pictures in the moving picture memory 107 directly.

The moving picture compressing unit 105 and the fine still picture compressing unit 106 may also be composed respectively so that both units 105 and 106 can share a processing circuit for such processings as discrete cosine conversion and can switch the mode between moving picture image compression and fine still picture compression. In this case, it is only needed to change the mode between when recording a fine still picture file and when recording still

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pictures in the format of compressed moving picture streams converted from fine still pictures.

Fig.2 shows an example of the recording file format for moving and still pictures in a video recording apparatus in this embodiment. In Fig.2, numeral 201 is a root directory, which is the top hierarchical layer of the logic data file management structure on an optical disk, which is a recording medium. Numeral 202 is a data directory named as DVD_RTAV for recording data files of moving pictures (including multiplexed audios), still pictures, and audio data. The VR_MOVIE.VRO is a data file for storing moving pictures and the VR_STILL.VRO is a data file for recording still pictures, which are MPEG I pictures and compressed audio data. The VR_AUDIO.VRO is a data file for recording audio data when in after-recording of audios. The VR_MANGR.IFO is a management file indicating how data files are recorded in each of VR_MOVIE.VRO, VR_STILL.VRO, and VR_AUDIO.VRO files. Numeral 203 is a directory for recording other data files than the compressed moving pictures file. Although such a directory name as JPEG is picked up as an example in this embodiment, this directory name is not restricted at all and JPEG files may be recorded directly in the root directory without creating any JPEG file under the directory named as JPEG.

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In the moving picture photographing mode, moving pictures are recorded in the VR_MOVIE.VRO file under the DVD_RTAV directory 202 shown in Fig.2, as well as the management information in the management file VR_MANGR.IFO is rewritten. In the still picture photographing mode, still pictures, which are MPEG I pictures, are recorded in the VR_STILL.VRO file and the management information in the management file VR_MANGR.IFO is rewritten. In addition, a JPEG-compressed picture data file is recorded as 00000001.jpg under the JPEG directory 203, and each time still pictures are photographed, MPEG I picture still pictures are added in the VR_STILL.VRO file, as well as still pictures are recorded with a new file name sequentially as a serial number like 00000002.jpg each time still pictures are photographed.

Although file names are described as serial numbers like 00000001.jpg, 00000002.jpg, and the file extension is described as jpg in this embodiment, both file name and file extension are not restricted at all.

According to this embodiment, therefore, still pictures, which are MPEG I pictures, converted from fine still pictures, as well as a JPEG fine still pictures file are recorded when still pictures are photographed, so it is possible to reproduce those still pictures even in any of recordable players and other ordinary players which

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reproduce moving pictures. In addition, the same pictures can be taken out as JPEG fine still pictures and handled on personal computers, etc.

<Second Embodiment>

Fig.3 is a system block diagram indicating an embodiment of a recording apparatus united with a camera used as a video recording apparatus of the present invention. In this embodiment, a compressed screen displayed for searching pictures, that is, thumb nail pictures, are also recorded when in reproducing pictures. In Fig.2, numeral 101 is an optical lens for focusing pictures and 102 is a CCD sensor, which is photoelectric converting means for converting the light on focused pictures to electric signals. Numeral 103 is a signal processing unit for converting picture information converted to electric signals further to video signals and 104 is a driving unit for driving the CCD sensor 102. Numeral 105 is a moving picture compressing unit for compressing video signals in accordance with such a moving picture encoding standard as MPEG. Numeral 106 is a fine still picture compressing unit for compressing video signals in accordance with such a fine still picture encoding standard as JPEG and 107 is a moving picture memory for storing pictures temporarily when the moving picture compressing unit 105 performs a compression processing and 108 is a still

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picture memory for storing pictures temporarily when the fine still picture compressing unit 106 performs a compression processing. Numeral 109 is a signal converting unit for converting the signal format of fine still picture signals to the same signal format as that of single frame moving picture signals and 110 is a microphone for converting collected audios to electric audio signals. Numeral 111 is an audio compressing unit for converting audio signals to digital signals and compressing predetermined digital audios. Numeral 112 is a multiplexing unit for multiplexing compressed moving picture streams generated in the moving picture compressing unit 105 and compressed audio streams generated in the audio compressing unit 111. Numeral 113 is a recording control unit for managing recording of moving and still pictures in data files and controlling the recording with the use of a predetermined file system. Numeral 114 is such a recording medium as an optical disk, etc. Numeral 115 is a system control unit for controlling the driving unit 104, the moving picture compressing unit 105, the fine still picture compressing unit 106, the moving picture memory 107, the still picture memory 108, and the recording control unit 113 one-dimensionally. Numeral 116 is a switch used by the user to select the recording mode between moving picture photographing and still picture photographing. The

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configurations and operations of those items are the same as those in the first embodiment shown in Fig.1. Numeral 117 is a screen compressing unit for creating thumb nail pictures by compressing the screen of moving pictures or fine still pictures.

While the moving picture photographing mode is selected by the switch 116, the compressed moving streams generated in the moving picture compressing unit 105 and the compressed audio streams generated in the audio compressing unit 111 are multiplexed and recorded on the recording medium 114 just like in the first embodiment. At the same time, pictures of a frame representing object moving pictures, for example, the start frame picture, is read from the moving picture memory 107, then the screen is compressed by the screen compressing unit 117 and the pictures are stored in the still picture memory 108. In this case, it is premised that the size of the compressed screen is a thumb nail size, for example, 160 pixels in the horizontal direction and 120 pixels in the vertical direction. When recording of moving pictures is ended, the fine still picture compressing unit 106 compresses the thumb nail pictures stored in the still picture memory 108 and records the pictures as thumb nail file data on the recording medium 114. The thumb nail file data differs from any of moving picture stream data and still picture file data.

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If the still picture photographing mode is selected by the switch 116, at first, still picture file data generated in the fine still picture compressing unit 106 are recorded on the recording medium 114 together with still pictures in the compressed moving picture stream format generated in the moving picture compressing unit 105 just like in the first embodiment. Then, fine still pictures are read from the still picture memory 108. After that, the screen is compressed by the screen compressing unit 117 and the read fine still pictures are stored again in the still picture memory 108. At this time, the size of the compressed screen is a thumb nail size, for example, 160 pixels in the horizontal direction and 120 pixels in the vertical direction. After that, the thumb nail pictures stored in the still picture memory 108 are compressed in the fine still picture compressing unit 106, then recorded on the recording medium 114 as thumb nail file data, which is different from any of moving picture stream data and still picture file data.

According to this embodiment, because the same compressed pictures as representative moving pictures or still pictures are recorded when in photographing of moving pictures and still pictures, it is possible to display such screens as the searching screen including this compressed

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pictures quickly when in reproducing so as to make it easier for the user to control the apparatus.

In the above embodiment, if the still picture photographing mode is selected by the switch 116, then still pictures whose signal format is converted to the same one as that of single frame moving picture signals are read from the moving picture memory 107 and stored in the still picture memory 108 after the screen is compressed by the screen compressing unit 117. After that, it is possible to compress still pictures in the fine still picture compressing unit 106 and record them on the recording medium 114 as thumb nail file data.

It is also possible to read either of the fine still pictures stored in the still picture memory 108 or the still pictures whose signal format is changed to the same one as that of the single frame moving picture image signals stored in the moving picture memory 107, then store them in the still picture memory 108 after the screen is compressed by the screen compressing unit 117, and then compress the still pictures in the fine still picture compressing unit 106 and record them on the recording medium 114 as thumb nail file data.

According to this embodiment, because the same compressed pictures as representative moving pictures or still pictures are recorded when in photographing of moving

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pictures and still pictures, it is possible to display such screens as the searching screen including this compressed pictures quickly when in reproducing so as to make it easier for the user to control the apparatus.

Because the signal converting unit 109 and the screen compressing unit 117 are similar in processing contents, they may be united into a processing unit.

The screen compressing unit 117 may be composed so that the CPU obtains moving or still pictures from the moving picture memory 107 or the still picture memory 108 using a program and compresses the pictures through an arithmetic operation, then writes the compressed pictures in the still picture memory 108 directly.

Although thumb nail pictures are encoded by the fine still picture compressing unit 106 in this embodiment, the pictures may be encoded with another different encoding method.

Thumb nail pictures may also be encoded by the CPU through an arithmetic operation. In this case, the CPU obtains thumb nail pictures directly from the still picture memory 108 using a program, then writes the encoded pictures in a buffer memory disposed in the not-illustrated rear stage (the multiplexing unit 112 or the recording control unit 113).

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Fig.4 shows an example of the file format for recording moving pictures, still pictures, and thumb nail pictures in the video recording apparatus of this embodiment. In Fig.4, numeral 201 is a root directory, which is the top hierarchical layer of the logic data file management structure on an optical disk, which is a recording medium. Numeral 202 is a directory named as DVD_RTAV used to record data files for moving pictures (including multiplexed audios), still pictures, and audio data. Numeral 203 is a directory for recording JPEG data files for storing compressed still pictures. The contents in the files are the same as those in each file in the file format shown in Fig.2. Numeral 204 is a directory for recording data files containing compressed thumb nail pictures respectively. Although THUMBNAIL is used as a directory name as an example in this embodiment, this directory name is not restricted at all; a data file containing compressed thumb nail pictures may be placed directly in the root directory. Furthermore, although moving picture thumb nail and still picture thumb nail are not separated in different directories in this embodiment, they may be separated in different directories.

In the moving picture photographing mode, moving pictures are recorded in the VR_MOVIE.VRO file under the DVD_RTAV directory 202 shown in Fig.4, as well as the

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management information in the management file VR_MANGR.IFO is rewritten. Furthermore, a thumb nail picture file containing JPEG-compressed data is recorded with a file name of t0000001.jpg under the THUMBNAIL directory 204. In the still picture photographing mode, MPEG I-picture still pictures are recorded in the VR_STILL.VRO file and the management information in the management file VR_MANGR.IFO is rewritten, as well as a fine still picture data file containing JPEG-compressed data is recorded with a file name of 00000001.jpg under the JPEG directory 203, and furthermore, the thumb nail picture data file containing JPEG-compressed data is recorded with a file name of t0000002.jpg under the THUMBNAIL directory 204. After that, each time moving or still pictures are photographed, the pictures are recorded with a file name sequentially as a serial number like t0000003.jpg under the THUMBNAIL directory 204.

Although both fine still pictures and thumb nail pictures are recorded in a JPEG data file respectively in this embodiment, both fine still and thumb nail pictures may be recorded in any file format and in any different file formats.

Although serial numbers are used as file names, for example, like t0000001.jpg, t0000002.jpg, and jpg is used

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as the file extension in this embodiment, the file names and the file extension are not limited only to them.

According to this embodiment, because the same compressed pictures as representative moving pictures or still pictures are recorded when in photographing of moving pictures and still pictures, it is possible to display such screens as the searching screen including this compressed pictures quickly when in reproducing so as to make it easier for the user to control the apparatus.

<Third Embodiment>

Fig.5 is a system block diagram indicating an embodiment of the video reproducing apparatus of the present invention. In this embodiment, pictures are reproduced from a recording medium on which the pictures are recorded by the video recording apparatus of the present invention. In Fig.5, numeral 114 is such a recording medium as an optical disk, and the like. Numeral 118 is a reproducing control unit for managing data files of both moving and still pictures to be reproduced and controlling the reproduction of those pictures with the use of a predetermined file system. Numeral 119 is a separating unit for separating compressed moving streams from compressed audio streams and transmitting separated streams to the moving picture expanding unit 120 and the audio expanding unit 126 respectively. Numeral 120 is a moving picture expanding

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unit for expanding compressed moving picture streams or a compressed still picture data file to restore original video signals in accordance with such a moving picture encoding standard as MPEG. Numeral 121 is a moving picture memory for storing pictures temporarily when the moving picture expanding unit 120 expands pictures. Numeral 122 is a thumb nail picture expanding unit for expanding compressed thumb nail pictures to restore original thumb nail pictures in accordance with such an encoding standard as JPEG. Numeral 123 is a thumb nail picture memory for storing pictures temporarily when the thumb nail picture expanding unit 122 expands pictures. Numeral 124 is a video processing unit for converting restored moving, still, or thumb nail pictures to video signals. Numeral 125 is a video output terminal connected to an external display apparatus or recording apparatus for displaying moving pictures and used to output moving, still, or thumb nail pictures in a moving picture signal format. Numeral 126 is an audio expanding unit for expanding audio streams compressed with a predetermined digital audio compression method to restore original audio signals. Numeral 127 is an audio output terminal for outputting restored audio signals and 128 is a system control unit for controlling the reproducing control unit 118, the moving picture expanding unit 120, the moving picture memory 121, the thumb nail picture expanding

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unit 122, and the thumb nail picture memory 123 one-dimensionally. Numeral 129 is such input buttons as a cursor button and a decision button used by the user to select an object picture from thumb nail pictures displayed on the screen.

The recording medium 114 contains moving, still, and thumb nail pictures recorded in the file format shown in Fig.4. If pictures are reproduced from the recording medium 114, the system control unit 128 controls the whole system as follows to display a list of thumb nail pictures. The reproducing control unit 118 reproduces the thumb nail data files recorded on the recording medium 114 sequentially, then the thumb nail picture expanding unit 122 expands each of those thumb nail data files and lists up those files in the thumb nail picture memory 123. The list of the thumb nail data files created in the thumb nail picture memory 123 is then output from the video output terminal 125 via the video processing unit 124 and displayed on an external display apparatus connected to the terminal. Then, the user selects an object picture from the list of the thumb nail pictures with the use of the input buttons 129.

If a moving image is selected, the system control unit 128 controls the whole system as follows. The reproducing control unit 118 reproduces a moving picture data file corresponding to the selected thumb nail, then the

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separating unit 119 separates compressed moving picture streams from compressed audio streams. The compressed moving picture streams are converted to video signals sequentially, while the moving picture expanding unit 120 transfers the video signals to the moving picture memory 121. The video signals are then read from the moving picture memory 121 and output from the video output terminal 125 via the video processing unit 124. The compressed audio streams are expanded in the audio expanding unit 126 and output from the audio output terminal 127.

If a still picture is selected, the system control unit 128 controls the whole system as follows. The reproducing control unit 118 reproduces a data file in such a compressed moving picture stream format as the MPEG I-picture one. The data file is selected from two types of still picture data files corresponding to the selected thumb nail. Then, the moving picture expanding unit 120 restores the reproduced data file to still pictures in the same signal format as that of the single-frame moving picture signals and stores the picture in the moving picture memory 121. The still pictures are then read repetitively from the moving picture memory 121 and output from the video output terminal 125 via the video processing unit 124.

According to this embodiment, therefore, when a still picture thumb nail is selected to display a still picture,

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a data file in the compressed moving picture stream format is selected from two types of still picture data files corresponding to the thumb nail so as to be reproduced and output from the video output terminal in the moving picture format. It is thus possible to omit the signal converting circuit for converting the format of the fine still picture signals to the same signal format as that of the single frame moving picture signals, thereby the apparatus circuit is simplified. Furthermore, if no fine still picture signal is output as described in this embodiment, the fine still picture expanding circuit can also be omitted.

If the output destination is an apparatus for outputting fine still picture signals, a fine still picture data file selected from two types of still picture data files corresponding to the selected thumb nail may be output, of course. The output file may be selected such way according to the resolution of the destination apparatus.

<Fourth Embodiment>

Fig.6 is a system block diagram indicating an embodiment of the video reproducing apparatus of the present invention. In this embodiment, the video reproducing apparatus can incorporate such a display medium as a liquid crystal panel in itself so as to display reproduced moving, still, and thumb nail pictures. In Fig.6, numeral 114 is such a recording medium as an optical disk, etc. Numeral

118 is a reproducing control unit for managing data files of both moving and still pictures to be reproduced and controlling the reproduction of those pictures with the use of a predetermined file system. Numeral 119 is a separating unit for separating compressed moving streams from compressed audio streams and transmitting separated streams to the moving picture expanding unit 120 and the audio expanding unit 126 respectively. Numeral 120 is a moving picture expanding unit for expanding compressed moving picture streams or a compressed still picture data file to restore original video signals in accordance with such a moving picture encoding standard as MPEG. Numeral 121 is a moving picture memory for storing pictures temporarily when the moving picture expanding unit 120 expands pictures. Numeral 122 is a thumb nail picture expanding unit for expanding compressed thumb nail pictures to restore original thumb nail pictures in accordance with such an encoding standard as JPEG. Numeral 123 is a thumb nail picture memory for storing pictures temporarily when the thumb nail picture expanding unit 122 expands pictures. Numeral 124 is a video processing unit for converting restored moving, still, or thumb nail pictures to video signals. Numeral 126 is an audio expanding unit for expanding audio streams compressed with a predetermined digital audio compression method to restore original audio

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signals. Numeral 128 is a system control unit for controlling the reproducing control unit 118, the moving picture expanding unit 120, the moving picture memory 121, the thumb nail picture expanding unit 122, and the thumb nail picture memory 123 one-dimensionally. Numeral 129 is such input buttons as a cursor button and a decision button used by the user to select an object picture from thumb nail pictures displayed on the screen. The configurations and operations of those items are the same as those in the third embodiment shown in Fig.5. Numeral 130 is such a display medium as a liquid crystal panel for displaying reproduced moving, still, and thumb nail pictures and 131 is a speaker for sounding reproduced audios.

If pictures are reproduced from the recording medium 114 just like in the third embodiment, a list of thumb nail pictures is created and displayed on the display medium 130. Then, the user selects an object picture from the list of the thumb nail pictures with the use of the input buttons 131.

If a moving image is selected, a moving picture data file corresponding to the selected thumb nail is reproduced and displayed on the display medium 130 just like in the third embodiment. The audios are sounded from the speaker 131.

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If a still picture is selected, a data file in such a compressed moving picture stream format as the MPEG I-picture one is selected from two types of still picture data files corresponding to the selected thumb nail just like in the third embodiment. Then, the reproduced data file is displayed on the display medium 130.

According to this embodiment, therefore, when a still picture thumb nail is selected to display a still picture, a data file in the compressed moving picture stream format is selected from two types of still picture data files corresponding to the thumb nail so as to be reproduced and output from the video output terminal set in the moving picture format. It is thus possible to omit the signal converting circuit for converting the format of the fine still picture signals to the same signal format as that of the single frame moving picture signals, thereby the apparatus circuit is simplified. Furthermore, if no fine still picture signal is output as described in this embodiment, the fine still picture expanding circuit can also be omitted.

If the output destination is an apparatus for outputting fine still picture signals, a fine still picture data file selected from two types of still picture data files corresponding to the selected thumb nail may be output, of

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course. The output file may be selected such way according to the resolution of the destination apparatus.

As described above, according to the present invention, therefore, fine frame moving pictures converted from fine still pictures, as well as a fine still picture data file can be recorded when in photographing still pictures. For example, pictures can be reproduced even by any of recordable players for reproducing such moving pictures as MPEG ones and other ordinary players. Furthermore, photographed still pictures can be handled as fine still pictures even on personal computers.

According to this embodiment, because the same compressed pictures as representative moving pictures or still pictures are recorded when in photographing of moving pictures and still pictures, it is possible to display such screens as the searching screen including this compressed pictures quickly when in reproducing so as to make it easier for the user to control the apparatus.

Furthermore, if a still picture thumb nail is selected to display a still picture when in reproducing, a data file in the compressed moving picture stream format is selected from two types of still picture data files so as to be reproduced and output from the video output terminal set in the moving picture format. It is thus possible to omit the signal converting circuit for converting the format of the

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fine still picture signals to the same signal format as that of the single frame moving picture signals, thereby the apparatus circuit is simplified. Furthermore, if no fine still picture signal is output as described in this embodiment, the fine still picture expanding circuit can also be omitted.

WHAT IS CLAIMED IS:

1. A recording medium for recording thereon:
moving pictures encoded by a first encoding method;
first pictures corresponding to said moving pictures, which
have pixels smaller than said moving pictures;
still pictures encoded by a second encoding method; and
second pictures corresponding to said still pictures, which
have pixels smaller than said still pictures.

2. A recording medium in accordance with claim 1, wherein
said moving pictures are encoded by the MPEG standard as the
first encoding method and said still pictures are encoded by the
JPEG standard as the second encoding method.

ABSTRACT OF THE DISCLOSURE

A recording medium which records thereon moving pictures encoded by a first encoding method, first pictures corresponding to the moving pictures and which have pixels smaller than the moving pictures, still pictures encoded by a second encoding method, and second pictures corresponding to the still pictures and which have pixels smaller than the still pictures.

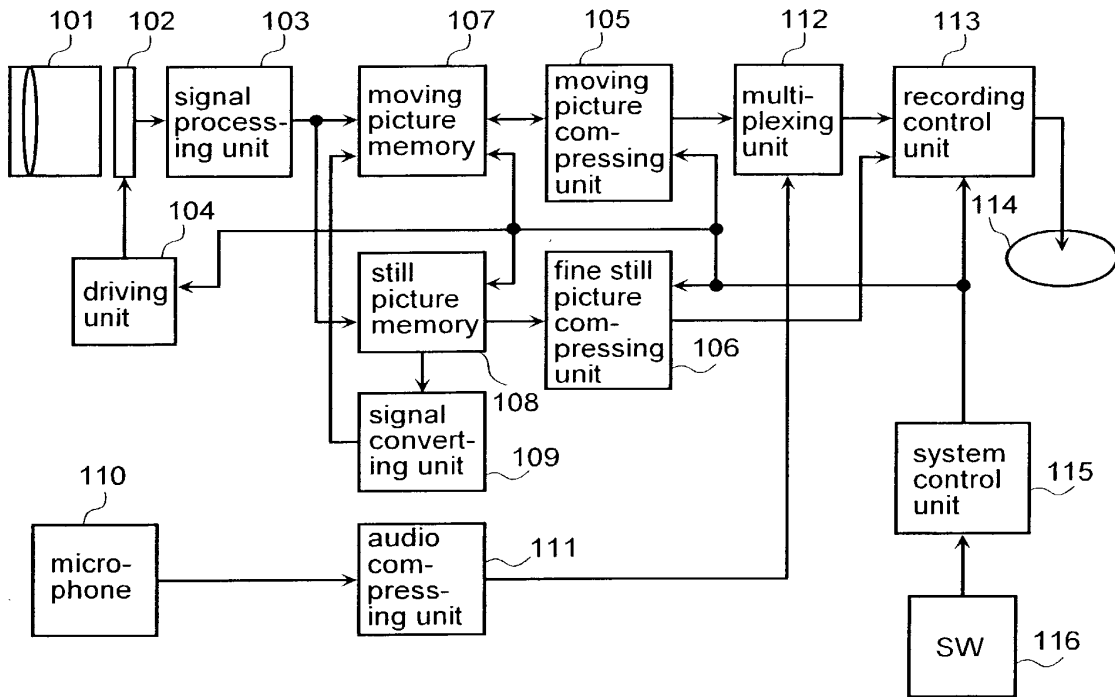
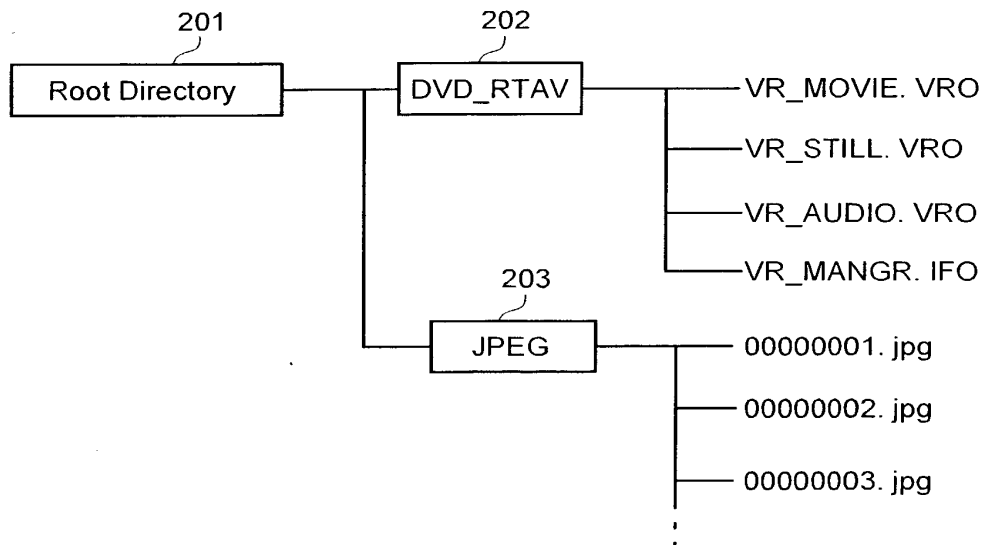
FIG.1**FIG.2**

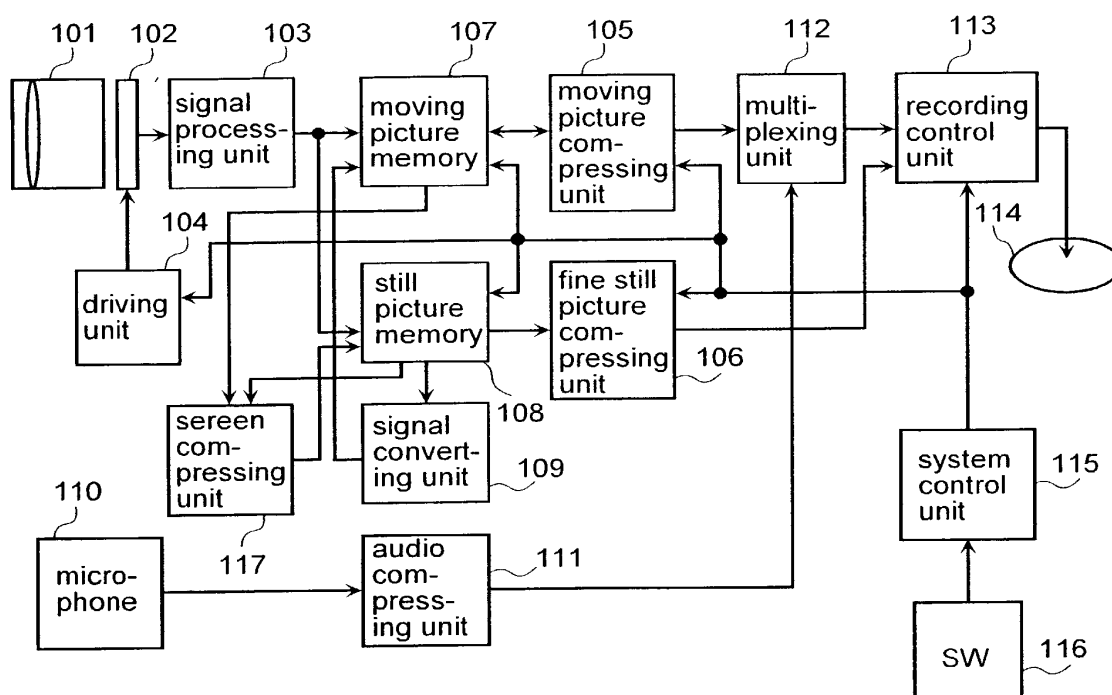
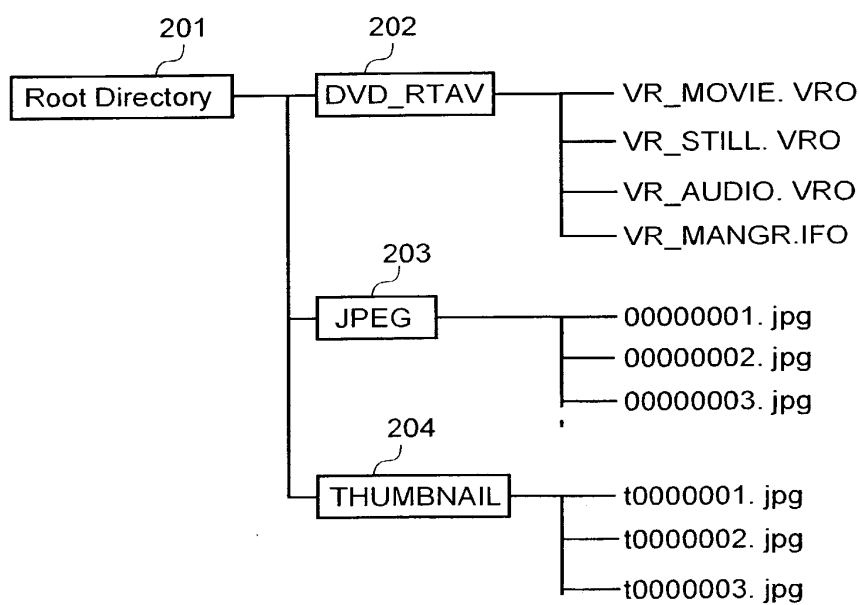
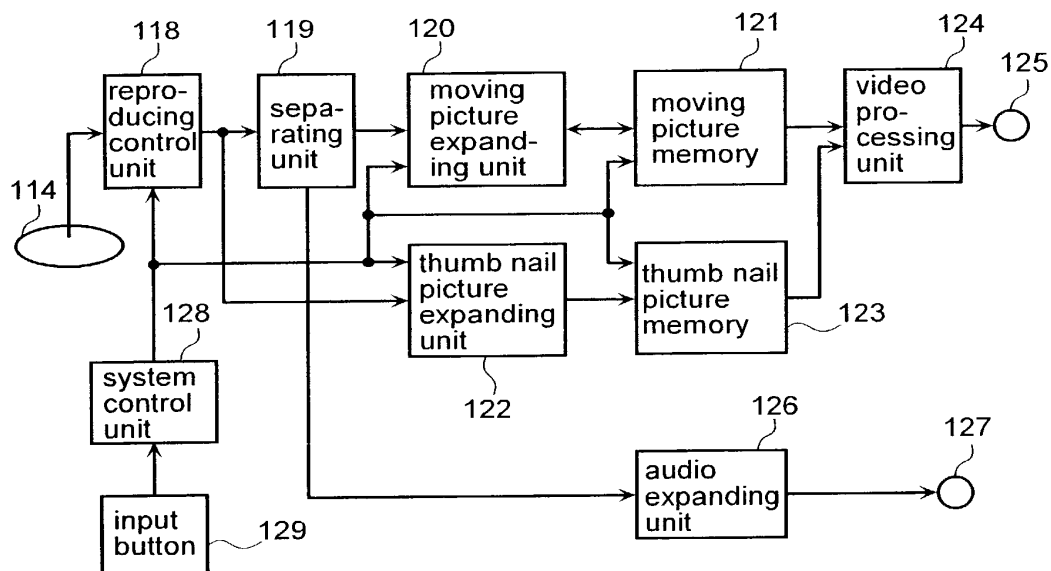
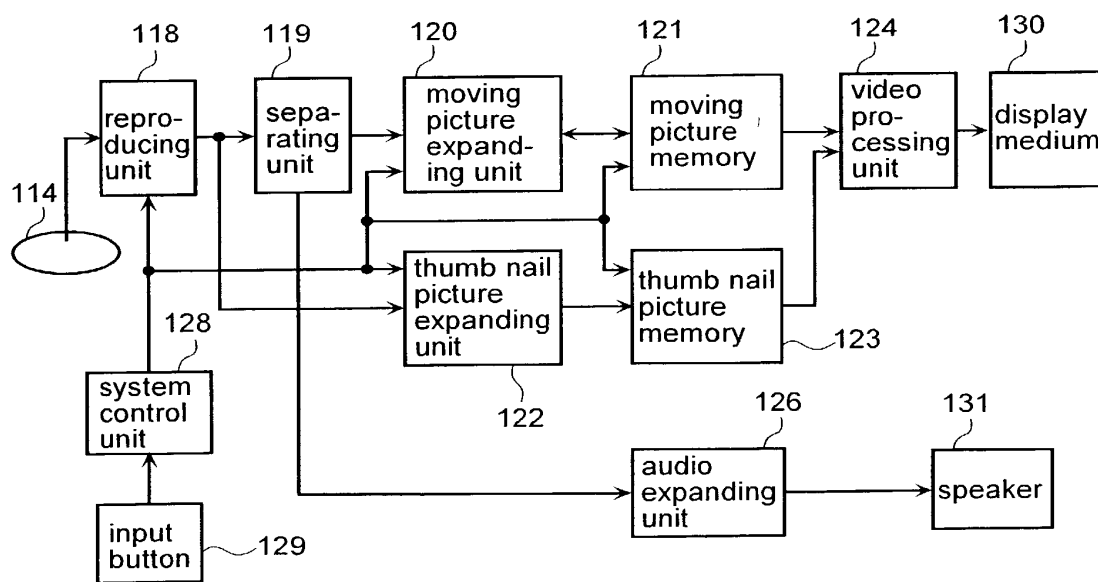
FIG.3**FIG.4**

FIG.5**FIG.6**

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name, I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

" METHOD AND APPARATUS FOR RECORDING AND REPRODUCING VIDEO DATA,
AND RECORDING MEDIUM "

the specification of which (check one)

☐

is attached hereto.

☒

was filed on 20/09/1999

as Application Serial No. PCT/JP99/05107

and was amended on _____

(if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

Priority Claimed

<u>P11-189868</u>	<u>Japan</u>	<u>05/07/1999</u>	☒	☐
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No
_____	_____	_____	☐	☐
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No
_____	_____	_____	☐	☐
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No
_____	_____	_____	☐	☐
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No
_____	_____	_____	☐	☐
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

_____	_____	_____
(Application Serial No.)	(Filing Date)	(Status: patented, pending, abandoned)
_____	_____	_____
(Application Serial No.)	(Filing Date)	(Status: patented, pending, abandoned)
_____	_____	_____
(Application Serial No.)	(Filing Date)	(Status: patented, pending, abandoned)
_____	_____	_____
(Application Serial No.)	(Filing Date)	(Status: patented, pending, abandoned)

I hereby appoint as principal attorneys; Donald R. Antonelli, Reg. No. 20,296; David T. Terry, Reg. No. 20,178; Melvin Kraus, Reg. No. 22,466; Stanley A. Wal, Reg. No. 26,432; William I. Solomon, Reg. No. 28,565; Gregory E. Montone, Reg. No. 28,141; Ronald J. Shore, Reg. No. 28,577; Donald E. Stout, Reg. No. 26,422; Alan E. Schiavelli, Reg. No. 32,087; James N. Dresser, Reg. No. 22,973 and Carl I. Brundidge, Reg. No. 29,621 to prosecute and transact all business connected with this application and any related United States application and international applications. Please direct all communications to the following address:

Antonelli, Terry, Stout & Kraus
Suite 1800
1300 North Seventeenth Street
Arlington, Virginia 22209
Telephone: (703) 312-6600
Fax: (703) 312-6666

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United State Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

	(Full Name)	(Signature)
Date <u>Dec. 1, 1999</u>	Inventor <u>Masaru TAKAHASHI</u>	<u>Masaru Takahashi</u>
Residence <u>Same as post office address</u>		Citizenship <u>Japan</u>
Post Office Address <u>5-2-64-313, Sugita, Isogo-ku, Yokohama-shi, KANAGAWA, JAPAN</u>		
Date <u>Dec. 1, 1999</u>	Inventor <u>Junji SHIOKAWA</u>	<u>Junji Shio'kawa</u>
Residence <u>Same as post office address</u>		Citizenship <u>Japan</u>
Post Office Address <u>4-1-36-102, Higashi kaigan kita, Chigasaki-shi, KANAGAWA, JAPAN</u>		
Date _____	Inventor _____	
Residence _____		Citizenship _____
Post Office Address _____		
Date _____	Inventor _____	
Residence _____		Citizenship _____
Post Office Address _____		
Date _____	Inventor _____	
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Date _____	Inventor _____	
Residence _____		Citizenship _____
Post Office Address _____		

J1050 U.S. PTO
10/19/04
07/10/02

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PATENT NUMBER and
ISSUE DATE

U.S. UTILITY Patent Application

APPL NUM 10191504	FILING DATE 07/10/2002	CLASS 386	SUBCLASS 120	GAU 2615	EXAMINER Boccia
**APPLICANTS: Takahashi Masaru; Shiokawa Junji;					
**CONTINUING DATA VERIFIED: THIS APPLICATION IS A CON OF 09/446,338 12/20/1999 PAT 6,424,795					
NOTE-DISCLAIMER The term of this patent shall not extend beyond the expiration date of Pat. No. <u>6,424,795</u>					
** FOREIGN APPLICATIONS VERIFIED: JAPAN P11-189868 07/05/1999					
PG-PUB ☐ DO NOT PUBLISH ☐		RESCIND ☐			
Foreign priority claimed ☒ yes ☐ no		35 USC 119 conditions met ☒ yes ☐ no		ATTORNEY DOCKET NO 501.37977CX3	
TITLE : Recording medium					

U.S. DEPT. OF COMM./PAT. & TM.-PTO-436L (Rev. 12-94)

NOTICE OF ALLOWANCE MAILED		CLAIMS ALLOWED	
		Total Claims	Print Claim for O.G.
Assistant Examiner			
ISSUE FEE		DRAWING	
Amount Due	Date Paid	Sheets Drwg.	Figs. Drwg.
		Print Fig.	
		Primary Examiner	
☒ TERMINAL DISCLAIMER		PREPARED FOR ISSUE	
		Application Examiner	
WARNING: The information disclosed herein may be restricted. Unauthorized disclosure may be prohibited by the United States Code Title 35, Sections 122, 181 and 368, Possession outside the U.S. Patent & Trademark Office is restricted to authorized employees and contractors only.			

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SEARCH

SEARCH			
Class	Sub.	Date	Exmr.
386	120 117 112 121 124 125	3/24/01	✓
348	220.1 231.99 333.05		
Updated	Search all	3/27/01	✓

INTERFERENCE SEARCHED

INTERFERENCE SEARCHED			
Class	Sub.	Date	Exmr.

SEARCH NOTES

(List databases searched. Attach search strategy inside.)

	Date	Exmr.
Tha. Tran (2015) Consultation object 101 Argument	3/27/07	VEN
Test Lead End	5/6/03	

ISSUING CLASSIFICATION
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^ Continued on Issue Slip Inside File Jacket

INDEX OF CLAIMS											
✓		Rejected	- (Through numeral) ...		Canceled	N		Non-elected	A		Appeal
□		Allowed	+		Restricted	I		Interference	O		Objected

DC 533 AL 8-28-02

Claim		Restricted		Date	
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PTO/SB/05 (03-01)

Approved for use through 10/31/2002. OMB 0651-0032
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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UTILITY PATENT APPLICATION TRANSMITTAL (Only for new nonprovisional applications under 37 CFR 1.53(b))		Attorney Docket No. 501.37977CX3	
		First Inventor TAKAHASHI, MASARU	
		Title METHOD AND APPRATUS FOR RECORDING AND REPRODUCING VIDEO DATA, AND RECORDING MEDIUM	
		Express Mail Label No.	

APPLICATION ELEMENTS SEE MPEP chapter 600 concerning utility patent application contents.		ADDRESS TO: Assistant Commissioner for Patents Box Patent Application Washington, DC 20231	
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1. ☒ Fee Transmittal Form (e.g., PTO/SB/17) (Submit an original and a duplicate for fee processing) 2. ☐ Applicant claims small entity status. See 37 CFR 1.27. 3. ☒ Specification [Total Pages: 40] (preferred arrangement set forth below) -Descriptive title of the invention -Cross Reference to Related Applications -Statement Regarding Fed sponsored R & D -Reference to sequence listing, a table, or a computer program listing appendix -Background of the Invention -Brief Summary of the Invention -Brief Description of the Drawings (if filed) -Detailed Description -Claim(s) -Abstract of the Disclosure 4. ☒ Drawing(s) (35 U.S.C. 113) [Total Pages: 3] 5. Oath or Declaration [Total Pages: 2] a. ☐ Newly executed (original or copy) b. ☒ Copy from a prior application (37 CFR 1.63 (d)) (for continuation/divisional with Box 18 completed) i. ☐ DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) Named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b) 6. ☐ Application Data Sheet. See 37 CFR 1.76	7. ☐ CD-ROM or CD-R in duplicate, large table or Computer Program (Appendix) 8. Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary) a. ☐ Computer Readable Form (CRF) b. Specification Sequence Listing on: i. ☐ CD-ROM or CD-R (2 copies); or ii. ☐ paper c. ☐ Statements verifying identity of above copies
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ACCOMPANYING APPLICATION PARTS	
9. ☐ Assignment Papers (cover sheet & documents(s)) 10. ☐ 37 CFR 3.73(b) Statement ☐ Power of Attorney (when there is an assignee) 11. ☐ English Translation Document (if applicable) 12. ☒ Information Disclosure ☐ Copies of IDS Citations Statement (IDS)/PTO-1449 13. ☒ Preliminary Amendment 14. ☒ Return Receipt Postcard (MPEP 503) (Should be specifically itemized) 15. ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed) 16. ☐ Nonpublication Request under 35 U.S.C. 122 (b)(2)(B)(i). Applicant must attach form PTO/SB/35 or its equivalent. 17. ☐ Other:	

18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment, or in an Application Data Sheet under 37 CFR 1.76:

☒ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: **09/446,338**

Prior application information: Examiner: **V. Boccia** Group Art Unit: **2615**

For CONTINUATION OR DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 5b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

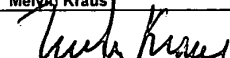
19. CORRESPONDENCE ADDRESS

☒ Customer Number or Bar Code Label		020457		or ☐ Correspondence address below	
(Insert Customer No. or Attach bar code label here)					
Name ANTONELLI, TERRY, STOUT & KRAUS, LLP					
Address					
City		State		Zip Code	
Country		Telephone	(703) 312-6600	Fax	(703) 312-6666
Name	Melvin Kraus	Registration No. (Attorney/Agent)		22,466	
Signature	<i>Melvin Kraus</i>	Date	JULY 10, 2002		

Burden Hour Statement: This form is estimated to take .2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Box Patent Application, Washington, DC 20231.

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FEE TRANSMITTAL for FY 2002 <i>Patent fees are subject to annual revision.</i>				Complete if Known																																																																																																																																																																																				
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1. ☒ The Commissioner is hereby authorized to charge indicated fees and credit overpayments to: Deposit Account Number 01-2135 Deposit Account Name Antonelli, Terry, Stout & Kraus, LLP ☐ Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17 ☐ Applicant Claims small entity status. See 37 CFR 1.27						3. ADDITIONAL FEES <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Fee Code</th> <th>Large Entity Fee (\$)</th> <th>Small Entity Fee (\$)</th> <th>Fee Description</th> <th>Fee Paid</th> </tr> </thead> <tbody> <tr><td>105</td><td>130</td><td>205</td><td>65</td><td>Surcharge - late filing fee or oath</td><td></td></tr> <tr><td>127</td><td>50</td><td>227</td><td>25</td><td>Surcharge - late provisional filing fee or cover sheet</td><td></td></tr> <tr><td>139</td><td>130</td><td>139</td><td>130</td><td>Non-English specification</td><td></td></tr> <tr><td>147</td><td>2,520</td><td>147</td><td>2,520</td><td>For filing a request for <i>ex parte</i> reexamination</td><td></td></tr> <tr><td>112</td><td>920*</td><td>112</td><td>920*</td><td>Requesting publication of SIR prior to Examination action</td><td></td></tr> <tr><td>113</td><td>1,840*</td><td>113</td><td>1,840*</td><td>Requesting publication of SIR after Examiner action</td><td></td></tr> <tr><td>115</td><td>110</td><td>215</td><td>55</td><td>Extension for reply within first month</td><td></td></tr> <tr><td>116</td><td>400</td><td>216</td><td>200</td><td>Extension for reply within second month</td><td></td></tr> <tr><td>117</td><td>920</td><td>217</td><td>460</td><td>Extension for reply within third month</td><td></td></tr> <tr><td>118</td><td>1,440</td><td>218</td><td>720</td><td>Extension for reply within fourth month</td><td></td></tr> <tr><td>128</td><td>1,960</td><td>228</td><td>980</td><td>Extension for reply within fifth month</td><td></td></tr> <tr><td>119</td><td>320</td><td>219</td><td>160</td><td>Notice of Appeal</td><td></td></tr> <tr><td>120</td><td>320</td><td>220</td><td>160</td><td>Filing a brief in support of an appeal</td><td></td></tr> <tr><td>121</td><td>280</td><td>221</td><td>140</td><td>Request for oral hearing</td><td></td></tr> <tr><td>138</td><td>1,510</td><td>138</td><td>1,510</td><td>Petition to institute a public use proceeding</td><td></td></tr> <tr><td>140</td><td>110</td><td>240</td><td>55</td><td>Petition to revive - unavoidable</td><td></td></tr> <tr><td>141</td><td>1,280</td><td>241</td><td>640</td><td>Petition to revive - unintentional</td><td></td></tr> <tr><td>142</td><td>1,280</td><td>242</td><td>640</td><td>Utility issue fee (or reissue)</td><td></td></tr> <tr><td>143</td><td>460</td><td>243</td><td>230</td><td>Design issue fee</td><td></td></tr> <tr><td>144</td><td>620</td><td>244</td><td>310</td><td>Plant issue fee</td><td></td></tr> <tr><td>122</td><td>130</td><td>122</td><td>130</td><td>Petitions to the Commissioner</td><td></td></tr> <tr><td>123</td><td>50</td><td>123</td><td>50</td><td>Processing fee under 37 CFR 1.17(q)</td><td></td></tr> <tr><td>126</td><td>180</td><td>126</td><td>180</td><td>Submission of Information Disclosure Stmt</td><td></td></tr> <tr><td>581</td><td>40</td><td>581</td><td>40</td><td>Recording each patent assignment per property (times number of properties)</td><td></td></tr> <tr><td>146</td><td>740</td><td>246</td><td>370</td><td>For each additional invention to be examined (37 CFR § 1.129(a))</td><td></td></tr> <tr><td>149</td><td>740</td><td>249</td><td>370</td><td>For each additional invention to be examined (37 CFR § 1.129(b))</td><td></td></tr> <tr><td>179</td><td>740</td><td>279</td><td>370</td><td>Request for Continued Examination (RCE)</td><td></td></tr> <tr><td>169</td><td>900</td><td>169</td><td>900</td><td>Request for expedited examination of a design application</td><td></td></tr> </tbody> </table>						Fee Code	Large Entity Fee (\$)	Small Entity Fee (\$)	Fee Description	Fee Paid	105	130	205	65	Surcharge - late filing fee or oath		127	50	227	25	Surcharge - late provisional filing fee or cover sheet		139	130	139	130	Non-English specification		147	2,520	147	2,520	For filing a request for <i>ex parte</i> reexamination		112	920*	112	920*	Requesting publication of SIR prior to Examination action		113	1,840*	113	1,840*	Requesting publication of SIR after Examiner action		115	110	215	55	Extension for reply within first month		116	400	216	200	Extension for reply within second month		117	920	217	460	Extension for reply within third month		118	1,440	218	720	Extension for reply within fourth month		128	1,960	228	980	Extension for reply within fifth month		119	320	219	160	Notice of Appeal		120	320	220	160	Filing a brief in support of an appeal		121	280	221	140	Request for oral hearing		138	1,510	138	1,510	Petition to institute a public use proceeding		140	110	240	55	Petition to revive - unavoidable		141	1,280	241	640	Petition to revive - unintentional		142	1,280	242	640	Utility issue fee (or reissue)		143	460	243	230	Design issue fee		144	620	244	310	Plant issue fee		122	130	122	130	Petitions to the Commissioner		123	50	123	50	Processing fee under 37 CFR 1.17(q)		126	180	126	180	Submission of Information Disclosure Stmt		581	40	581	40	Recording each patent assignment per property (times number of properties)		146	740	246	370	For each additional invention to be examined (37 CFR § 1.129(a))		149	740	249	370	For each additional invention to be examined (37 CFR § 1.129(b))		179	740	279	370	Request for Continued Examination (RCE)		169	900	169	900	Request for expedited examination of a design application	
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SUBMITTED BY		Complete (if applicable)			
Name (Print/Type)	Melyio Kraus	Registration No. (Attorney/Agent)	22,486	Telephone	(703) 312-6600
Signature		Date	07/10/02		

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FIG.1

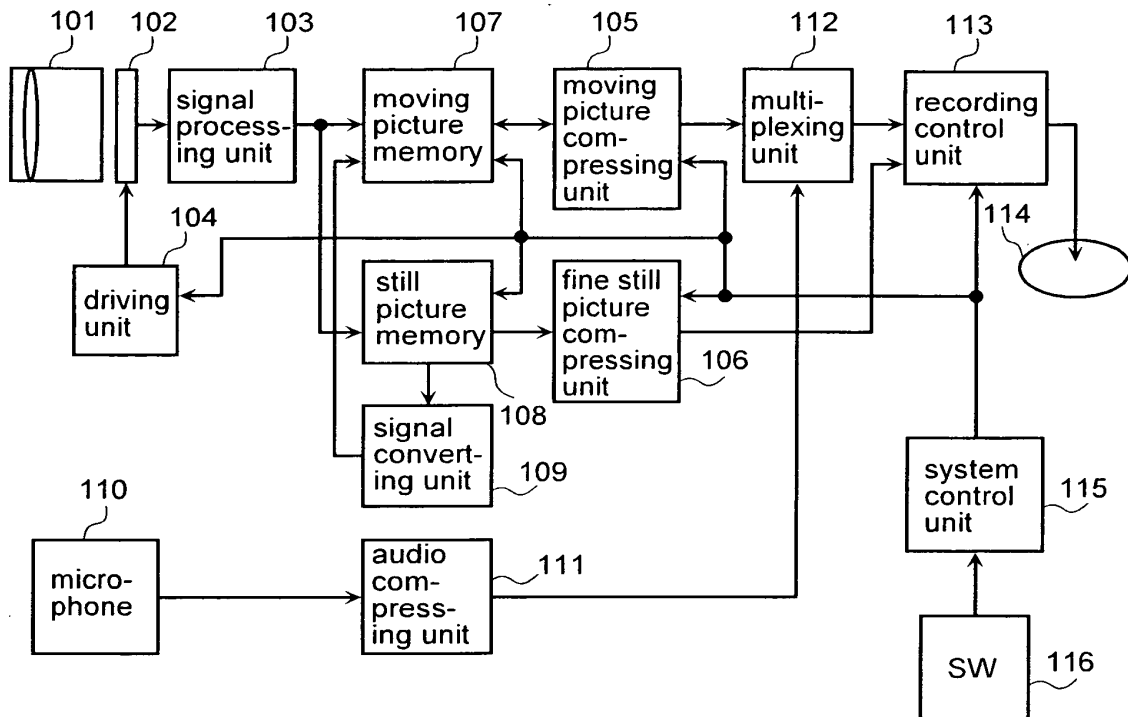


FIG.2

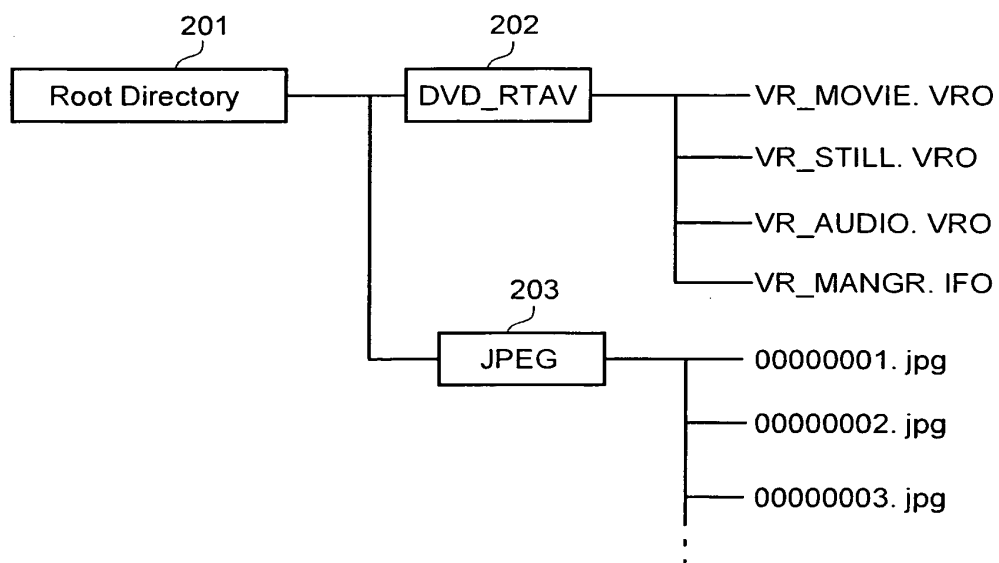


FIG.3

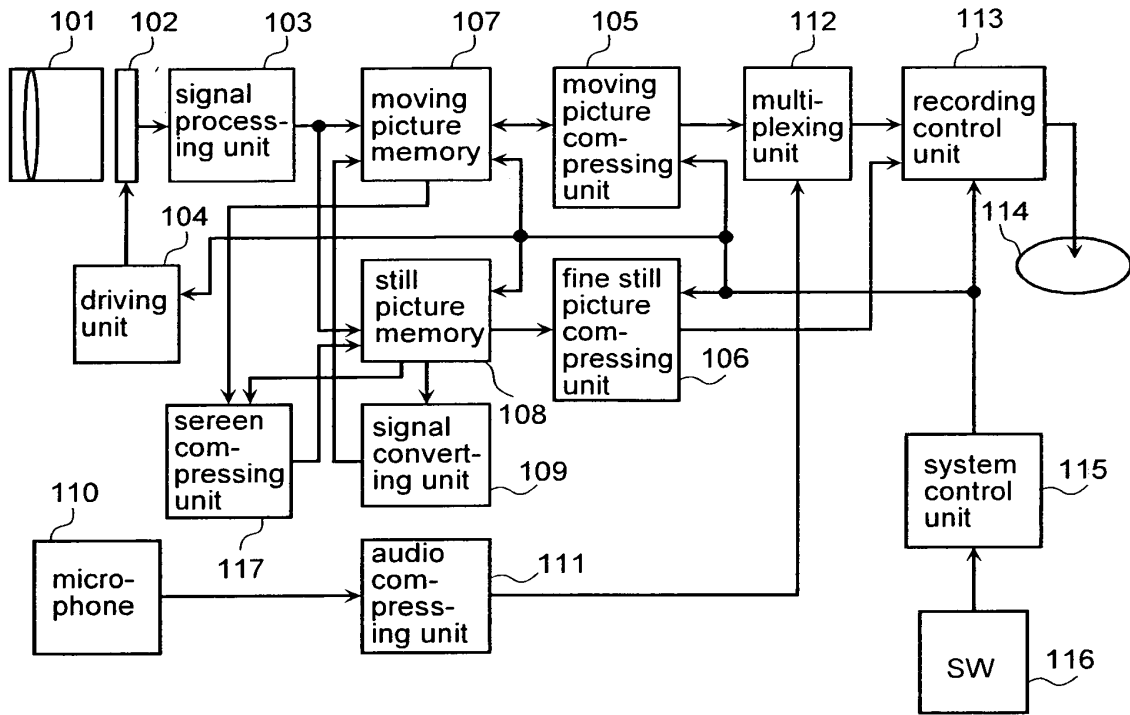


FIG.4

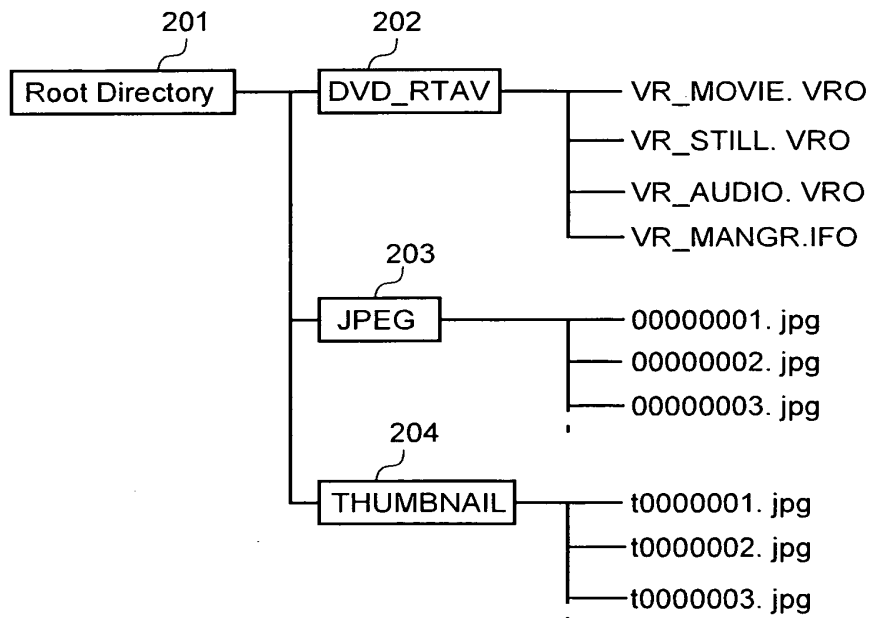
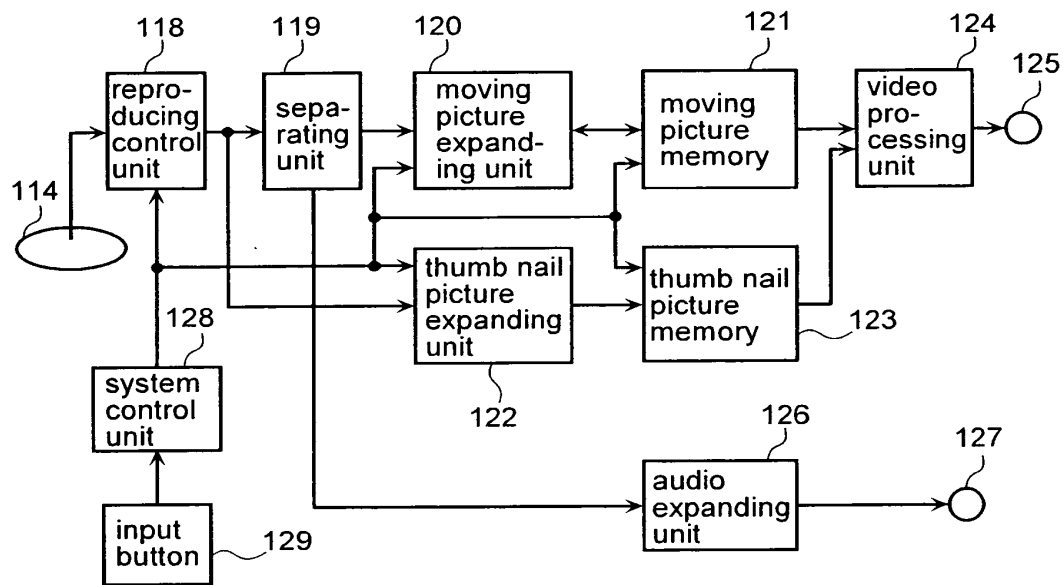
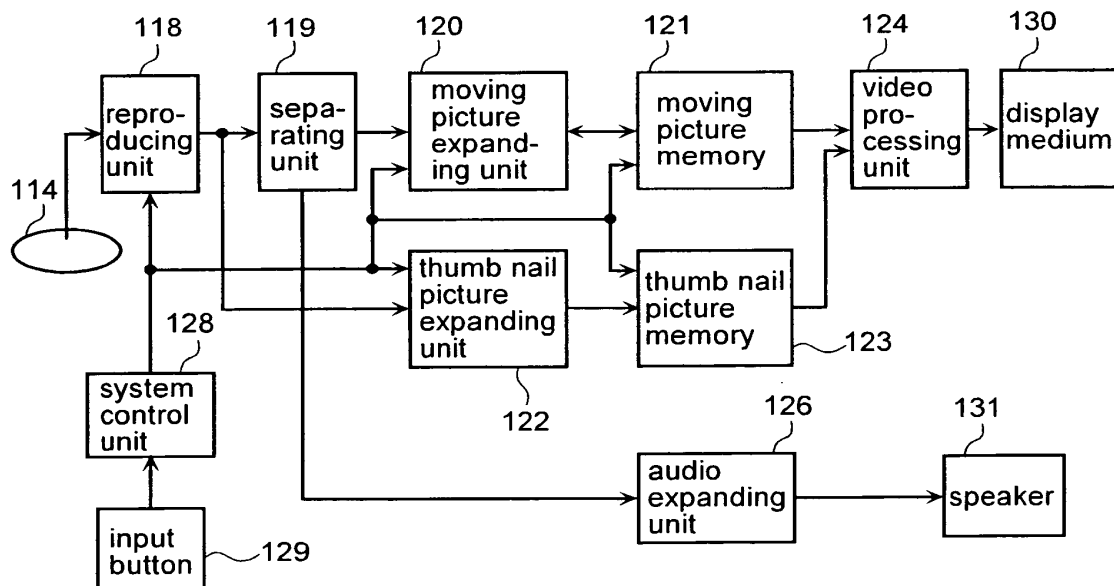


FIG.5**FIG.6**

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SPECIFICATION

RECORDING MEDIUM

~~METHOD AND APPARATUS FOR RECORDING AND REPRODUCING
VIDEO DATA, AND RECORDING MEDIUM~~

Ins 27

FIELD OF THE INVENTION

The present invention relates to an apparatus and a method for recording moving and still pictures, and an apparatus and a method for reproducing recorded moving and still pictures, as well as a recording medium.

BACKGROUND ART

Recently, along with tendency toward large scale in capacity of recording medium such as rewritable optical disks, etc. and with improvement in techniques for compressing moving pictures, the techniques for digital cameras and recordable players, etc. that have the function of recording moving pictures on optical disks have been reviewed. Under the situation, recordings of both moving and still pictures on optical disks in a common format have coming into reality.

As such a compression method, it would be advantageous to use the MPEG (Moving Picture Expert Group) standard for recording moving pictures from the viewpoint of compression efficiency. The MPEG standard is a well-known technique

described in, for example, "The Latest Guidebook to MPEG" (ASCII Co., Ltd., Aug. 1, 1994), etc. The detailed description for the MPEG will thus be omitted here.

As for a compression method for still pictures, the JPEG (Joint Photographic coding Experts Group) standard used for recording digital still pictures from general electronic still cameras may be replaced with another method if the method can record the data equivalent to one frame of moving pictures recorded by the MPEG as I picture. If the recordable player described above has a means for expanding pictures compressed by, for example, the MPEG compression method, and then both moving and still pictures can be reproduced. In this case, it is no need to use such an expanding means as JPEG for reproducing pictures, thereby the cost of the reproducing system can be reduced.

However, the data must be processed fast to encode moving pictures in real time and it is impossible to increase the number of pixels per frame of moving pictures so much. For example, the maximum number of pixels per frame is 720 in the horizontal direction and 480 in the vertical direction on the encoding level referred to as the main profile main level which handles the resolution of the present TV sets, required for the MPEG method. On the other hand, the encoding time for one sheet of still pictures is not limited so strictly, so that the number of pixels to be

handled in accordance with the high resolution of the object photographing element can be increased. Consequently, most of the present electronic still cameras can record still pictures with the use of the JPEG compression method and the number of pixels to be handled by those cameras is being increased year after year.

In order to enable any reproducing apparatus such as recordable players and ordinary players to reproduce data on the basis of the MPEG, as well as record high resolution still pictures, it is only needed to record both MPEG I pictures and JPEG file pictures. Such techniques are disclosed in, for example, the Japanese Patent Unexamined Publication No.10-108133. According to the disclosed techniques, pictures is encoded and recorded with a plurality of different methods at a time and both moving and still pictures are encoded and recorded simultaneously. The conventional techniques, however, do not consider encoding of still pictures read from a fine photographing element with the use of such an encoding method as MPEG for moving pictures. In particular, no care is paid for the difference in reading pictures from a photographing element between reading fine still pictures and reading moving pictures.

Furthermore, the above conventional techniques do not consider any correspondence to recordings of both moving and still pictures, although they can record both encoded still

pictures and partial still pictures so as to make it easier for an user to control the apparatus, for example, for searching pictures when in reproducing.

DISCLOSURE OF THE INVENTION

Generally, the number of pixels to be read from a photographing element within a unit time is limited. The number of pixels to be read per frame of moving pictures therefore is also limited. On the other hand, a long time can be spared to read a large number of pixels from still pictures slowly. Consequently, if an apparatus that employs a fine photographing element is used to record fine still pictures, a sheet of pictures is read by spending a time required for reading one or more frames. The reading method thus comes to differ between moving picture and still pictures.

Under the circumstances, it is the first object of the present invention to provide an apparatus and a method for recording pictures, which are preferred to solve the above conventional problems and enable recordable players and other ordinary players which reproduce moving pictures to reproduce and record fine still pictures, as well.

It is the second object of the present invention to provide an apparatus and a method for recording pictures, which is more improved in controlling such reproducing

operations as searching even when in recording both moving and still pictures, as well as a recording medium in which pictures are recorded as described above.

Furthermore, it is the third object of the present invention to provide an apparatus and a method for reproducing both moving and still pictures, which can reproduce the recording medium on which pictures are recorded with the use of the recording apparatus and the recording method described above, as well as improved more in controlling such reproducing operations as searching and composed simply.

In order to achieve the first object, the recording method of the present invention used for a video recording apparatus that can record both moving and still pictures on a recording medium includes steps for recording moving pictures encoded with the use of the first encoding method when in recording moving pictures; and for recording still pictures encoded with the use of the second encoding method and other still pictures encoded by the first encoding method from single frame signals obtained from the still pictures when in recording still pictures. Furthermore, the video recording apparatus of the present invention comprises optical focusing means composed of an optical lens system; photoelectric converting means for converting pictures focused by the optical focusing means to electric

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signals; signal processing means for converting electric signals converted by the photoelectric converting means to video signals; driving means provided with two modes (moving picture photographing mode and still picture photographing mode) so as to drive reading of electric signals from the photoelectric converting means so that the video signals are converted to predetermined moving picture signals in the moving photographing mode and drive reading of electric signals from the photoelectric converting means so that the video signals are converted to video signals finer than the moving picture signals in the still picture photographing mode; signal converting means for converting the signal format of fine video signals in the still picture photographing mode to the same format as that of single frame moving picture signals in the moving picture photographing mode; moving picture encoding means for encoding moving picture signals output from the signal processing means with the use of the first encoding method in the moving picture photographing mode and encoding single frame signals output from the signal converting means with the use of the first encoding method in the still picture photographing mode; still picture encoding means for encoding fine video signals with the use of the second encoding method in the still picture photographing mode; recording controlling means for controlling a recording medium for recording encoded moving

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and still pictures and recording of moving and still pictures on the recording medium; system controlling means for controlling each of the above means one-dimensionally; and selecting means for selecting one of the recording modes. The recording apparatus can thus record moving images encoded by the moving encoding means when in recording moving pictures and record still pictures encoded by the still picture encoding means, as well as other still pictures encoded by the moving encoding means from single frame signals obtained from the still pictures when in recording still pictures.

The video recording apparatus of the present invention further includes moving picture storing means for storing single frame signals output from the signal converting means in the still picture photographing mode; and still picture storing means for storing fine video signals so that the recording apparatus records moving pictures by reading moving picture signals from the moving picture storing means and encoding them with the use of the moving picture encoding means when in recording moving pictures and records still pictures by reading still pictures from the fine still picture storing means and encoding them with the use of the still picture encoding means when in recording still pictures, and also records fine video signals read from the moving picture storing

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means and encoded by the moving picture encoding means. The fine video signals are stored once in the still picture storing means before they are converted to single frame signals by the signal converting means, then stored in the moving picture storing means.

In order to achieve the second object of the present invention, the present invention provides a recording method characterized in that when in recording moving pictures, moving pictures are recorded together with a still picture obtained by compressing signals of a frame representing the moving pictures to record and when in recording still pictures, compressed still pictures are also recorded together with non-compressed still pictures. The recording method also employs screen compressing means for compressing the screen of pictures of a frame representing the moving picture signals to record when in recording moving pictures and compressing the screen of still pictures to record when in recording still pictures, so that when in recording of moving pictures, moving pictures encoded by the moving encoding means are recorded together with still pictures whose screen is compressed by the screen compressing means and when in recording of still pictures, still pictures encoded by the still picture encoding means are recorded together with other still pictures encoded by the moving encoding means from single

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frame signals obtained from the still pictures, and further other still pictures whose screen is compressed by the screen compressing means.

Furthermore, the present invention provides the recording method characterized in that when in recording of moving pictures, moving pictures are recorded together with a still picture obtained by compressing the signals of a frame representing the moving pictures to record and when in recording of still pictures, still pictures obtained by compressing the single frame signals to be encoded by the first encoding method is also recorded. The video recording apparatus further includes screen compressing means for compressing the screen of pictures of a frame representing moving picture signals to record when in recording moving pictures and compressing the screen of single frame signals obtained from the still pictures when in recording still pictures, so that when in recording moving pictures, the moving pictures encoded by the moving picture encoding means are recorded together with the still pictures whose screen is compressed by the screen compressing means and when in recording still pictures, the still pictures encoded by the still picture encoding means are recorded together with still pictures encoded by the moving picture encoding means from single frame signals obtained from the still pictures,

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as well as other still pictures whose screen is compressed by the screen compressing means.

The present invention also provides a recording method for recording a still picture obtained by compressing signals of a frame representing the moving pictures to record when in recording moving pictures and recording either compressed still pictures or still pictures obtained by compressing single frame signals to be encoded by the first encoding method. In this case, the video recording apparatus of the present invention further includes screen compressing means for compressing the screen of pictures of a frame representing the object moving picture signals when in recording moving pictures and compressing the screen of either the still pictures or single frame signals obtained from the still pictures when in recording still pictures, so that when in recording moving pictures, moving pictures encoded by the moving picture encoding means are recorded together with still pictures whose screen is compressed by the screen compressing means and when in recording still pictures, still pictures encoded by the still picture encoding means are recorded together with other still pictures encoded by the moving picture encoding means from single frame signals obtained from the same still pictures, and further other still pictures whose screen is compressed by the screen compressing means.

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Furthermore, the present invention further provides a recording medium on which moving pictures encoded by the first encoding means are recorded together with still pictures obtained by compressing the screen of a representative one of the moving pictures, other still pictures encoded by the second encoding method, single frame moving pictures created from the still pictures encoded by the first encoding method, and further other still pictures whose screen is compressed.

In order to achieve the third object of the present invention, the present invention provides a reproducing method that can reproduce the above recording medium, wherein it is possible to reproduce and output single frame moving pictures created from the still pictures encoded by the first encoding method corresponding to the selected still picture to at least one output destination when a still picture whose screen is compressed is selected and called. In this case, the reproducing method allows a still picture corresponding to the called still picture to be output in accordance with the picture resolution of the output destination. Furthermore, the video reproducing apparatus of the present invention further includes picture selecting means for specifying one of reproduced still pictures whose screen is compressed; reproducing controlling means for controlling reproduction of single frame moving pictures

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created from still pictured encoded by the first encoding method corresponding to the selected still picture when the selected still picture is a still picture whose screen is compressed; moving picture decoding means for decoding reproduced single frame moving pictures using the first encoding method.

Furthermore, the present invention provides a reproducing method used for a video reproducing apparatus that can reproduce the above recording medium, wherein a single frame moving picture created from a still picture encoded by the first encoding method corresponding to a selected still picture is reproduced and displayed when a still picture whose screen is compressed is selected and called. In this case, the reproducing apparatus that uses the above reproducing method is further provided with picture selecting means for specifying one of reproduced still pictures whose screen is compressed; reproducing control means for reproducing single frame moving pictures created from the still pictures encoded by the first encoding means corresponding to the selected still picture when the selected still picture is a still picture whose screen is compressed; moving picture decoding means for decoding the reproduced single frame moving pictures using the first encoding method; and displaying means for displaying decoded single frame moving pictures.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig.1 is a system block diagram of a recording apparatus united with a camera in an embodiment of a video recording apparatus of the present invention.

Fig.2 is a recording format of a recording medium used for the recording apparatus united with a camera.

Fig.3 is a system block diagram of a recording apparatus united with a camera in another embodiment of the video recording apparatus of the present invention.

Fig.4 is a recording format of a recording medium used for the recording apparatus united with a camera.

Fig.5 is a system block diagram of a video reproducing apparatus in an embodiment of the present invention.

Fig.6 is a system block diagram of the video reproducing apparatus in another embodiment of the present invention.

BEST MODE FOR CARRYING OUT THE INVENTION

Hereunder, the embodiments of the present invention will be described with reference to the accompanying drawings.

<First Embodiment>

Fig.1 is a system block diagram indicating a video recording apparatus united with a camera in an embodiment

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of the present invention. In Fig.1, numeral 101 is an optical lens for focusing an object picture and 102 is a CCD sensor, which is photoelectric converting means for converting the light of focused pictures to electric signals. Numeral 103 is a signal processing unit for converting picture information converted to electric signals further to video signals and 104 is a driving unit for driving the CCD sensor. Numeral 105 is a moving picture compressing unit for compressing video signals in accordance with such an encoding standard as MPEG used for moving pictures. Numeral 106 is a fine still picture compressing unit for compressing video signals in accordance with such an encoding standard as JPEG used for fine still pictures and 107 is a moving picture memory for storing pictures temporarily when the moving picture compressing unit 105 performs a compression processing. Numeral 108 is a still picture memory for storing pictures temporarily when the fine still picture compressing unit 106 performs a compressing processing. Numeral 109 is a signal converting unit for converting the signal format of fine still signals to the same signal format as that of single frame moving picture signals. Numeral 110 is a microphone for converting collected audios to electric audio signals and 111 is an audio compressing unit for converting audio signals to digital signals and compressing predetermined

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digital audios. Numeral 112 is a multiplexing unit for multiplexing compressed moving picture streams generated in the moving picture compressing unit 105 and compressed audio streams generated in the audio compressing unit 111.

Numeral 113 is a recording control unit for managing recorded data files of moving and still pictures to record and controlling the recording with the use of a predetermined file system. Numeral 114 is such a recording medium as an optical disk, etc. Numeral 115 is a system control unit for controlling the driving unit 104, the moving picture compressing unit 105, the fine still picture compressing unit 106, the moving picture memory 107, the still picture memory 108, and the recording control unit 113 one-dimensionally. Numeral 116 is a switch used by the user to select a recording mode between the moving picture photographing mode and the still picture photographing mode.

If the moving picture photographing mode is selected by the switch 116, the system control unit 115 controls the whole system as follows. The driving unit 104 drives the CCD sensor 102 to generate moving picture signals, so that the CCD sensor 102 converts the pictures focused by the optical lens 101 to electric signals. Then, the signal processing unit 103 converts the electric signals to digital signals, which become video signals. The video signals are

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then stored in the moving picture memory 107. While video signals in the compression process are transferred from the moving picture compressing unit 105 to the moving picture memory 107, the video signals are converted sequentially to compressed moving picture streams and audios collected by the microphone 110 are compressed in the audio compressing unit 111. After that, moving picture streams generated by the moving picture compressing unit 105 and compressed audio streams generated in the audio compressing unit 111 are multiplexed by the multiplexing unit 112. The multiplexed streams are recorded on the recording medium 114 via the recording control unit 113 in a predetermined recording format to be described later.

If the still picture photographing mode is selected by the switch 116, the system control unit 115 controls the whole system as follows. The driving unit 104 drives the CCD sensor 102 to generate still picture signals, so that the CCD sensor 102 converts the pictures focused by the optical lens 101 to electric signals, then the signal processing unit 103 converts the electric signals to digital signals, which become video signals. If the CCD sensor 102 is driven to generate still picture signals, fine video signals are output so that video signals for a sheet of still pictures are output in a time exceeding the one-frame period of moving picture signals. The still picture memory 108

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stores video signals equivalent to one sheet of still pictures. After that, the fine still picture compressing unit 106 compresses still pictures for one sheet stored in the still picture memory 108 and the compressed still pictures are recorded on the recording medium 114 via the recording control unit 113 as still picture file data. Then, the signal converting unit 109 converts the signal format of a sheet of pictures stored in the still picture memory 108 to the same signal format as that of single frame moving picture signals, then the converted signals are stored in the moving picture memory 107. Then, the moving picture compressing unit 105 compresses signals to MPEG I pictures, etc., then the I pictures are stored on the recording medium 114 via the recording control unit 113 as moving picture streams.

According to this embodiment, therefore, when in photographing still pictures, still pictures in the format of the compressed moving picture streams converted from fine still pictures are recorded together with a fine still picture file. Those pictures can thus be reproduced in any of recordable players and other ordinary players for reproducing moving pictures. The same pictures can also be fetched as fine still pictures so as to be handled on personal computers.

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Although signals read from the still picture memory 108 are converted in the signal converting unit 109 in this embodiment, fine video signals output from the signal processing unit 103 may also be converted directly in the signal converting unit 109. In this case, fine still picture signals and single frame moving picture image signals are stored in the still picture memory 108 and in the moving picture memory 107 simultaneously.

Furthermore, the moving picture memory 107 and the still picture memory 108 in this embodiment may be composed as different address spaces in one memory.

The signal converting unit 109 may also be composed so that the CPU obtains still pictures directly from the still picture memory 108 using a program and converts the still pictures to single frame moving pictures through an arithmetic operation, thereby writing the pictures in the moving picture memory 107 directly.

The moving picture compressing unit 105 and the fine still picture compressing unit 106 may also be composed respectively so that both units 105 and 106 can share a processing circuit for such processings as discrete cosine conversion and can switch the mode between moving picture image compression and fine still picture compression. In this case, it is only needed to change the mode between when recording a fine still picture file and when recording still

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pictures in the format of compressed moving picture streams converted from fine still pictures..

Fig.2 shows an example of the recording file format for moving and still pictures in a video recording apparatus in this embodiment. In Fig.2, numeral 201 is a root directory, which is the top hierarchical layer of the logic data file management structure on an optical disk, which is a recording medium. Numeral 202 is a data directory named as DVD_RTAV for recording data files of moving pictures (including multiplexed audios), still pictures, and audio data. The VR_MOVIE.VRO is a data file for storing moving pictures and the VR_STILL.VRO is a data file for recording still pictures, which are MPEG I pictures and compressed audio data. The VR_AUDIO.VRO is a data file for recording audio data when in after-recording of audios. The VR_MANGR.IFO is a management file indicating how data files are recorded in each of VR_MOVIE.VRO, VR_STILL.VRO, and VR_AUDIO.VRO files. Numeral 203 is a directory for recording other data files than the compressed moving pictures file. Although such a directory name as JPEG is picked up as an example in this embodiment, this directory name is not restricted at all and JPEG files may be recorded directly in the route directory without creating any JPEG file under the directory named as JPEG.

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In the moving picture photographing mode, moving pictures are recorded in the VR_MOVIE.VRO file under the DVD_RTAV directory 202 shown in Fig.2, as well as the management information in the management file VR_MANGR.IFO is rewritten. In the still picture photographing mode, still pictures, which are-MPEG I pictures, are recorded in the VR_STILL.VRO file and the management information in the management file VR_MANGR.IFO is rewritten. In addition, a JPEG-compressed picture data file is recorded as 00000001.jpg under the JPEG directory 203, and each time still pictures are photographed, MPEG I picture still pictures are added in the VR_STILL.VRO file, as well as still pictures are recorded with a new file name sequentially as a serial number like 00000002.jpg each time still pictures are photographed.

Although file names are described as serial numbers like 00000001.jpg, 00000002.jpg, and the file extension is described as jpg in this embodiment, both file name and file extension are not restricted at all.

According to this embodiment, therefore, still pictures, which are MPEG I pictures, converted from fine still pictures, as well as a JPEG fine still pictures file are recorded when still pictures are photographed, so it is possible to reproduce those still pictures even in any of recordable players and other ordinary players which

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reproduce moving pictures. In addition, the same pictures can be taken out as JPEG fine still pictures and handled on personal computers, etc.

<Second Embodiment>

Fig.3 is a system block diagram indicating an embodiment of a recording apparatus united with a camera used as a video recording apparatus of the present invention. In this embodiment, a compressed screen displayed for searching pictures, that is, thumb nail pictures, are also recorded when in reproducing pictures. In Fig.2, numeral 101 is an optical lens for focusing pictures and 102 is a CCD sensor, which is photoelectric converting means for converting the light on focused pictures to electric signals. Numeral 103 is a signal processing unit for converting picture information converted to electric signals further to video signals and 104 is a driving unit for driving the CCD sensor 102. Numeral 105 is a moving picture compressing unit for compressing video signals in accordance with such a moving picture encoding standard as MPEG. Numeral 106 is a fine still picture compressing unit for compressing video signals in accordance with such a fine still picture encoding standard as JPEG and 107 is a moving picture memory for storing pictures temporarily when the moving picture compressing unit 105 performs a compression processing and 108 is a still

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picture memory for storing pictures temporarily when the fine still picture compressing unit 106 performs a compression processing. Numeral 109 is a signal converting unit for converting the signal format of fine still picture signals to the same signal format as that of single frame moving picture signals and 110 is a microphone for converting collected audios to electric audio signals. Numeral 111 is an audio compressing unit for converting audio signals to digital signals and compressing predetermined digital audios. Numeral 112 is a multiplexing unit for multiplexing compressed moving picture streams generated in the moving picture compressing unit 105 and compressed audio streams generated in the audio compressing unit 111. Numeral 113 is a recording control unit for managing recording of moving and still pictures in data files and controlling the recording with the use of a predetermined file system. Numeral 114 is such a recording medium as an optical disk, etc. Numeral 115 is a system control unit for controlling the driving unit 104, the moving picture compressing unit 105, the fine still picture compressing unit 106, the moving picture memory 107, the still picture memory 108, and the recording control unit 113 one-dimensionally. Numeral 116 is a switch used by the user to select the recording mode between moving picture photographing and still picture photographing. The

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configurations and operations of those items are the same as those in the first embodiment shown in Fig.1. Numeral 117 is a screen compressing unit for creating thumb nail pictures by compressing the screen of moving pictures or fine still pictures.

While the moving picture photographing mode is selected by the switch 116, the compressed moving streams generated in the moving picture compressing unit 105 and the compressed audio streams generated in the audio compressing unit 111 are multiplexed and recorded on the recording medium 114 just like in the first embodiment. At the same time, pictures of a frame representing object moving pictures, for example, the start frame picture, is read from the moving picture memory 107, then the screen is compressed by the screen compressing unit 117 and the pictures are stored in the still picture memory 108. In this case, it is premised that the size of the compressed screen is a thumb nail size, for example, 160 pixels in the horizontal direction and 120 pixels in the vertical direction. When recording of moving pictures is ended, the fine still picture compressing unit 106 compresses the thumb nail pictures stored in the still picture memory 108 and records the pictures as thumb nail file data on the recording medium 114. The thumb nail file data differs from any of moving picture stream data and still picture file data.

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If the still picture photographing mode is selected by the switch 116, at first, still picture file data generated in the fine still picture compressing unit 106 are recorded on the recording medium 114 together with still pictures in the compressed moving picture stream format generated in the moving picture compressing unit 105 just like in the first embodiment. Then, fine still pictures are read from the still picture memory 108. After that, the screen is compressed by the screen compressing unit 117 and the read fine still pictures are stored again in the still picture memory 108. At this time, the size of the compressed screen is a thumb nail size, for example, 160 pixels in the horizontal direction and 120 pixels in the vertical direction. After that, the thumb nail pictures stored in the still picture memory 108 are compressed in the fine still picture compressing unit 106, then recorded on the recording medium 114 as thumb nail file data, which is different from any of moving picture stream data and still picture file data.

According to this embodiment, because the same compressed pictures as representative moving pictures or still pictures are recorded when in photographing of moving pictures and still pictures, it is possible to display such screens as the searching screen including this compressed

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pictures quickly when in reproducing so as to make it easier for the user to control the apparatus.

In the above embodiment, if the still picture photographing mode is selected by the switch 116, then still pictures whose signal format is converted to the same one as that of single frame moving picture signals are read from the moving picture memory 107 and stored in the still picture memory 108 after the screen is compressed by the screen compressing unit 117. After that, it is possible to compress still pictures in the fine still picture compressing unit 106 and record them on the recording medium 114 as thumb nail file data.

It is also possible to read either of the fine still pictures stored in the still picture memory 108 or the still pictures whose signal format is changed to the same one as that of the single frame moving picture image signals stored in the moving picture memory 107, then store them in the still picture memory 108 after the screen is compressed by the screen compressing unit 117, and then compress the still pictures in the fine still picture compressing unit 106 and record them on the recording medium 114 as thumb nail file data.

According to this embodiment, because the same compressed pictures as representative moving pictures or still pictures are recorded when in photographing of moving

pictures and still pictures, it is possible to display such screens as the searching screen including this compressed pictures quickly when in reproducing so as to make it easier for the user to control the apparatus.

Because the signal converting unit 109 and the screen compressing unit 117 are similar in processing contents, they may be united into a processing unit.

The screen compressing unit 117 may be composed so that the CPU obtains moving or still pictures from the moving picture memory 107 or the still picture memory 108 using a program and compresses the pictures through an arithmetic operation, then writes the compressed pictures in the still picture memory 108 directly.

Although thumb nail pictures are encoded by the fine still picture compressing unit 106 in this embodiment, the pictures may be encoded with another different encoding method.

Thumb nail pictures may also be encoded by the CPU through an arithmetic operation. In this case, the CPU obtains thumb nail pictures directly from the still picture memory 108 using a program, then writes the encoded pictures in a buffer memory disposed in the not-illustrated rear stage (the multiplexing unit 112 or the recording control unit 113).

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Fig.4 shows an example of the file format for recording moving pictures, still pictures, and thumb nail pictures in the video recording apparatus of this embodiment. In Fig.4, numeral 201 is a root directory, which is the top hierarchical layer of the logic data file management structure on an optical disk, which is a recording medium. Numeral 202 is a directory named as DVD_RTAV used to record data files for moving pictures (including multiplexed audios), still pictures, and audio data. Numeral 203 is a directory for recording JPEG data files for storing compressed still pictures. The contents in the files are the same as those in each file in the file format shown in Fig.2. Numeral 204 is a directory for recording data files containing compressed thumb nail pictures respectively. Although THUMBNAIL is used as a directory name as an example in this embodiment, this directory name is not restricted at all; a data file containing compressed thumb nail pictures may be placed directly in the root directory. Furthermore, although moving picture thumb nail and still picture thumb nail are not separated in different directories in this embodiment, they may be separated in different directories.

In the moving picture photographing mode, moving pictures are recorded in the VR_MOVIE.VRO file under the DVD_RTAV directory 202 shown in Fig.4, as well as the

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management information in the management file VR_MANGR.IFO is rewritten. Furthermore, a thumb nail picture file containing JPEG-compressed data is recorded with a file name of t0000001.jpg under the THUMBNAIL directory 204. In the still picture photographing mode, MPEG I-picture still pictures are recorded in the VR_STILL.VRO file and the management information in the management file VR_MANGR.IFO is rewritten, as well as a fine still picture data file containing JPEG-compressed data is recorded with a file name of 00000001.jpg under the JPEG directory 203, and furthermore, the thumb nail picture data file containing JPEG-compressed data is recorded with a file name of t0000002.jpg under the THUMBNAIL directory 204. After that, each time moving or still pictures are photographed, the pictures are recorded with a file name sequentially as a serial number like t0000003.jpg under the THUMBNAIL directory 204.

Although both fine still pictures and thumb nail pictures are recorded in a JPEG data file respectively in this embodiment, both fine still and thumb nail pictures may be recorded in any file format and in any different file formats.

Although serial numbers are used as file names, for example, like t0000001.jpg, t0000002.jpg, and jpg is used

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as the file extension in this embodiment, the file names and the file extension are not limited only to them.

According to this embodiment, because the same compressed pictures as representative moving pictures or still pictures are recorded when in photographing of moving pictures and still pictures, it is possible to display such screens as the searching screen including this compressed pictures quickly when in reproducing so as to make it easier for the user to control the apparatus.

<Third Embodiment>

Fig.5 is a system block diagram indicating an embodiment of the video reproducing apparatus of the present invention. In this embodiment, pictures are reproduced from a recording medium on which the pictures are recorded by the video recording apparatus of the present invention. In Fig.5, numeral 114 is such a recording medium as an optical disk, and the like. Numeral 118 is a reproducing control unit for managing data files of both moving and still pictures to be reproduced and controlling the reproduction of those pictures with the use of a predetermined file system. Numeral 119 is a separating unit for separating compressed moving streams from compressed audio streams and transmitting separated streams to the moving picture expanding unit 120 and the audio expanding unit 126 respectively. Numeral 120 is a moving picture expanding

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unit for expanding compressed moving picture streams or a compressed still picture data file to restore original video signals in accordance with such a moving picture encoding standard as MPEG. Numeral 121 is a moving picture memory for storing pictures temporarily when the moving picture expanding unit 120 expands pictures. Numeral 122 is a thumb nail picture expanding unit for expanding compressed thumb nail pictures to restore original thumb nail pictures in accordance with such an encoding standard as JPEG. Numeral 123 is a thumb nail picture memory for storing pictures temporarily when the thumb nail picture expanding unit 122 expands pictures. Numeral 124 is a video processing unit for converting restored moving, still, or thumb nail pictures to video signals. Numeral 125 is a video output terminal connected to an external display apparatus or recording apparatus for displaying moving pictures and used to output moving, still, or thumb nail pictures in a moving picture signal format. Numeral 126 is an audio expanding unit for expanding audio streams compressed with a predetermined digital audio compression method to restore original audio signals. Numeral 127 is an audio output terminal for outputting restored audio signals and 128 is a system control unit for controlling the reproducing control unit 118, the moving picture expanding unit 120, the moving picture memory 121, the thumb nail picture expanding

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unit 122, and the thumb nail picture memory 123 one-dimensionally. Numeral 129 is such input buttons as a cursor button and a decision button used by the user to select an object picture from thumb nail pictures displayed on the screen.

The recording medium 114 contains moving, still, and thumb nail pictures recorded in the file format shown in Fig.4. If pictures are reproduced from the recording medium 114, the system control unit 128 controls the whole system as follows to display a list of thumb nail pictures. The reproducing control unit 118 reproduces the thumb nail data files recorded on the recording medium 114 sequentially, then the thumb nail picture expanding unit 122 expands each of those thumb nail data files and lists up those files in the thumb nail picture memory 123. The list of the thumb nail data files created in the thumb nail picture memory 123 is then output from the video output terminal 125 via the video processing unit 124 and displayed on an external display apparatus connected to the terminal. Then, the user selects an object picture from the list of the thumb nail pictures with the use of the input buttons 129.

If a moving image is selected, the system control unit 128 controls the whole system as follows. The reproducing control unit 118 reproduces a moving picture data file corresponding to the selected thumb nail, then the

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separating unit 119 separates compressed moving picture streams from compressed audio streams. The compressed moving picture streams are converted to video signals sequentially, while the moving picture expanding unit 120 transfers the video signals to the moving picture memory 121. The video signals are then read from the moving picture memory 121 and output from the video output terminal 125 via the video processing unit 124. The compressed audio streams are expanded in the audio expanding unit 126 and output from the audio output terminal 127.

If a still picture is selected, the system control unit 128 controls the whole system as follows. The reproducing control unit 118 reproduces a data file in such a compressed moving picture stream format as the MPEG I-picture one. The data file is selected from two types of still picture data files corresponding to the selected thumb nail. Then, the moving picture expanding unit 120 restores the reproduced data file to still pictures in the same signal format as that of the single-frame moving picture signals and stores the picture in the moving picture memory 121. The still pictures are then read repetitively from the moving picture memory 121 and output from the video output terminal 125 via the video processing unit 124.

According to this embodiment, therefore, when a still picture thumb nail is selected to display a still picture,

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a data file in the compressed moving picture stream format is selected from two types of still picture data files corresponding to the thumb nail so as to be reproduced and output from the video output terminal in the moving picture format. It is thus possible to omit the signal converting circuit for converting the format of the fine still picture signals to the same signal format as that of the single frame moving picture signals, thereby the apparatus circuit is simplified. Furthermore, if no fine still picture signal is output as described in this embodiment, the fine still picture expanding circuit can also be omitted.

If the output destination is an apparatus for outputting fine still picture signals, a fine still picture data file selected from two types of still picture data files corresponding to the selected thumb nail may be output, of course. The output file may be selected such way according to the resolution of the destination apparatus.

<Fourth Embodiment>

Fig.6 is a system block diagram indicating an embodiment of the video reproducing apparatus of the present invention. In this embodiment, the video reproducing apparatus can incorporate such a display medium as a liquid crystal panel in itself so as to display reproduced moving, still, and thumb nail pictures. In Fig.6, numeral 114 is such a recording medium as an optical disk, etc. Numeral

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118 is a reproducing control unit for managing data files of both moving and still pictures to be reproduced and controlling the reproduction of those pictures with the use of a predetermined file system. Numeral 119 is a separating unit for separating compressed moving streams from compressed audio streams and transmitting separated streams to the moving picture expanding unit 120 and the audio expanding unit 126 respectively. Numeral 120 is a moving picture expanding unit for expanding compressed moving picture streams or a compressed still picture data file to restore original video signals in accordance with such a moving picture encoding standard as MPEG. Numeral 121 is a moving picture memory for storing pictures temporarily when the moving picture expanding unit 120 expands pictures. Numeral 122 is a thumb nail picture expanding unit for expanding compressed thumb nail pictures to restore original thumb nail pictures in accordance with such an encoding standard as JPEG. Numeral 123 is a thumb nail picture memory for storing pictures temporarily when the thumb nail picture expanding unit 122 expands pictures. Numeral 124 is a video processing unit for converting restored moving, still, or thumb nail pictures to video signals. Numeral 126 is an audio expanding unit for expanding audio streams compressed with a predetermined digital audio compression method to restore original audio

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signals. Numeral 128 is a system control unit for controlling the reproducing control unit 118, the moving picture expanding unit 120, the moving picture memory 121, the thumb nail picture expanding unit 122, and the thumb nail picture memory 123 one-dimensionally. Numeral 129 is such input buttons as a cursor button and a decision button used by the user to select an object picture from thumb nail pictures displayed on the screen. The configurations and operations of those items are the same as those in the third embodiment shown in Fig.5. Numeral 130 is such a display medium as a liquid crystal panel for displaying reproduced moving, still, and thumb nail pictures and 131 is a speaker for sounding reproduced audios.

If pictures are reproduced from the recording medium 114 just like in the third embodiment, a list of thumb nail pictures is created and displayed on the display medium 130. Then, the user selects an object picture from the list of the thumb nail pictures with the use of the input buttons 131.

If a moving image is selected, a moving picture data file corresponding to the selected thumb nail is reproduced and displayed on the display medium 130 just like in the third embodiment. The audios are sounded from the speaker 131.

If a still picture is selected, a data file in such a compressed moving picture stream format as the MPEG I-picture one is selected from two types of still picture data files corresponding to the selected thumb nail just like in the third embodiment. Then, the reproduced data file is displayed on the display medium 130.

According to this embodiment, therefore, when a still picture thumb nail is selected to display a still picture, a data file in the compressed moving picture stream format is selected from two types of still picture data files corresponding to the thumb nail so as to be reproduced and output from the video output terminal set in the moving picture format. It is thus possible to omit the signal converting circuit for converting the format of the fine still picture signals to the same signal format as that of the single frame moving picture signals, thereby the apparatus circuit is simplified. Furthermore, if no fine still picture signal is output as described in this embodiment, the fine still picture expanding circuit can also be omitted.

If the output destination is an apparatus for outputting fine still picture signals, a fine still picture data file selected from two types of still picture data files corresponding to the selected thumb nail may be output, of

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course. The output file may be selected such way according to the resolution of the destination apparatus.

As described above, according to the present invention, therefore, fine frame moving pictures converted from fine still pictures, as well as a fine still picture data file can be recorded when in photographing still pictures. For example, pictures can be reproduced even by any of recordable players for reproducing such moving pictures as MPEG ones and other ordinary players. Furthermore, photographed still pictures can be handled as fine still pictures even on personal computers.

According to this embodiment, because the same compressed pictures as representative moving pictures or still pictures are recorded when in photographing of moving pictures and still pictures, it is possible to display such screens as the searching screen including this compressed pictures quickly when in reproducing so as to make it easier for the user to control the apparatus.

Furthermore, if a still picture thumb nail is selected to display a still picture when in reproducing, a data file in the compressed moving picture stream format is selected from two types of still picture data files so as to be reproduced and output from the video output terminal set in the moving picture format. It is thus possible to omit the signal converting circuit for converting the format of the

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fine still picture signals to the same signal format as that of the single frame moving picture signals, thereby the apparatus circuit is simplified. Furthermore, if no fine still picture signal is output as described in this embodiment, the fine still picture expanding circuit can also be omitted.

WHAT IS CLAIMED IS:

1. A recording medium for recording thereon:
moving pictures encoded by a first encoding method;
first pictures corresponding to said moving pictures, which
have pixels smaller than said moving pictures;
still pictures encoded by a second encoding method; and
second pictures corresponding to said still pictures, which
have pixels smaller than said still pictures.

2. A recording medium in accordance with claim 1, wherein
said moving pictures are encoded by the MPEG standard as the
first encoding method and said still pictures are encoded by the
JPEG standard as the second encoding method.

ADD B1

ABSTRACT OF THE DISCLOSURE

A recording medium which records thereon moving pictures encoded by a first encoding method, first pictures corresponding to the moving pictures and which have pixels smaller than the moving pictures, still pictures encoded by a second encoding method, and second pictures corresponding to the still pictures and which have pixels smaller than the still pictures.

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name, I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

" METHOD AND APPARATUS FOR RECORDING AND REPRODUCING VIDEO DATA,
AND RECORDING MEDIUM "

the specification of which (check one)

☐

is attached hereto.

☒

was filed on 20/09/1999

as Application Serial No. PCT/JP99/05107

and was amended on _____

(if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

Priority Claimed

<u>P11-189868</u> (Number)	<u>Japan</u> (Country)	<u>05/07/1999</u> (Day/Month/Year Filed)	☒ Yes	☐ No
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	☐ Yes	☐ No
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	☐ Yes	☐ No
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	☐ Yes	☐ No
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	☐ Yes	☐ No
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	☐ Yes	☐ No

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

_____ (Application Serial No.)	_____ (Filing Date)	_____ (Status: patented, pending, abandoned)
_____ (Application Serial No.)	_____ (Filing Date)	_____ (Status: patented, pending, abandoned)
_____ (Application Serial No.)	_____ (Filing Date)	_____ (Status: patented, pending, abandoned)
_____ (Application Serial No.)	_____ (Filing Date)	_____ (Status: patented, pending, abandoned)

(Continued on Page 2)

I hereby appoint as principal attorneys; Donald R. Antonelli, Reg. No. 20,296; David T. Terry, Reg. No. 20,178; Melvin Kraus, Reg. No. 22,466; Stanley A. Wal, Reg. No. 26,432; William I. Solomon, Reg. No. 28,565; Gregory E. Montone, Reg. No. 28,141; Ronald J. Shore, Reg. No. 28,577; Donald E. Stout, Reg. No. 26,422; Alan E. Schiavelli, Reg. No. 32,087; James N. Dresser, Reg. No. 22,973 and Carl I. Brundidge, Reg. No. 29,621 to prosecute and transact all business connected with this application and any related United States application and international applications. Please direct all communications to the following address:

Antonelli, Terry, Stout & Kraus
Suite 1800
1300 North Seventeenth Street
Arlington, Virginia 22209
Telephone: (703) 312-6600
Fax: (703) 312-6666

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United State Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

	(Full Name)	(Signature)
Date <u>Dec. 1, 1999</u>	Inventor <u>Masaru TAKAHASHI</u>	<u>Masaru Takahashi</u>
Residence <u>Same as post office address</u>		Citizenship <u>Japan</u>
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Date <u>Dec. 1, 1999</u>	Inventor <u>Junji SHIOKAWA</u>	<u>Junji Shio'kawa</u>
Residence <u>Same as post office address</u>		Citizenship <u>Japan</u>
Post Office Address <u>4-1-36-102, Higashi kaigan kita, Chigasaki-shi, KANAGAWA, JAPAN</u>		
Date _____	Inventor _____	
Residence _____		Citizenship _____
Post Office Address _____		
Date _____	Inventor _____	
Residence _____		Citizenship _____
Post Office Address _____		
Date _____	Inventor _____	
Residence _____		Citizenship _____
Post Office Address _____		
Date _____	Inventor _____	
Residence _____		Citizenship _____
Post Office Address _____		
Date _____	Inventor _____	
Residence _____		Citizenship _____
Post Office Address _____		
Date _____	Inventor _____	
Residence _____		Citizenship _____
Post Office Address _____		
Date _____	Inventor _____	
Residence _____		Citizenship _____
Post Office Address _____		

PATENT APPLICATION SERIAL NO. _____

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE
FEE RECORD SHEET

07/15/2002 VYANG1 00000023 10191504

01 FC:101

740.00 0P

PTO-1556
(5/87)

*U.S. Government Printing Office: 2001 — 481-697/59173

PATENT APPLICATION FEE DETERMINATION RECORD

Effective October 1, 2001

Application or Docket Number

10191504

CLAIMS AS FILED - PART I

(Column 1) (Column 2)

TOTAL CLAIMS	2		
FOR	NUMBER FILED	NUMBER EXTRA	
TOTAL CHARGEABLE CLAIMS	2 minus 20 =	*	—
INDEPENDENT CLAIMS	1 minus 3 =	*	—
MULTIPLE DEPENDENT CLAIM PRESENT ☐			

* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

(Column 1) (Column 2) (Column 3)

AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	
	Total	*	2	Minus	** 20	=
	Independent	*	1	Minus	*** 3	=
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐					

(Column 1) (Column 2) (Column 3)

AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	
	Total	*	15	Minus	** 20	=
	Independent	*	5	Minus	*** 3	= 2
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐					

(Column 1) (Column 2) (Column 3)

AMENDMENT C		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	
	Total	*		Minus	**	=
	Independent	*		Minus	***	=
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐					

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

SMALL ENTITY TYPE ☐

OR OTHER THAN SMALL ENTITY

RATE	FEE
BASIC FEE	370.00
X\$ 9=	
X42=	
+140=	
TOTAL	

RATE	FEE
BASIC FEE	740.00
X\$18=	
X84=	
+280=	
TOTAL	740

SMALL ENTITY OR

OTHER THAN SMALL ENTITY

RATE	ADDITIONAL FEE
X\$ 9=	
X42=	
+140=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$18=	
X84=	
+280=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$ 9=	
X42=	
+140=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$18=	
X84=	17
+280=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$ 9=	
X42=	
+140=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$18=	
X84=	
+280=	
TOTAL ADDIT. FEE	

501.37977CX3

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): M. TAKAHASHI, et al
Serial No.: (not yet assigned)
Filed: July 10, 2002
For: METHOD AND APPARATUS FOR RECORDING AND
REPRODUCING VIDEO DATA, AND RECORDING MEDIUM

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D.C. 20231

July 10, 2002

Sir:

The following preliminary amendments and remarks are respectfully submitted in connection with the above-identified application.

TITLE OF THE INVENTION:

Please change the title of the invention to:
--RECORDING MEDIUM--.

IN THE SPECIFICATION:

Page 1, between the title of the invention and the heading "FIELD OF THE INVENTION", insert the following new paragraph:

--CROSS REFERENCE TO RELATED APPLICATION:

AI This is a continuation of U.S. application Serial No. 09/446,338, filed December 20, 1999, the subject matter of which is incorporated by reference herein.--

REMARKS

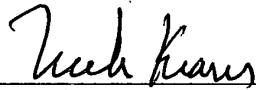
By the above amendment, the title of the invention has been changed to a title which is more clearly indicative of the invention, and the specification has been amended so as to incorporate the Cross Reference to the parent application.

Also enclosed is an Information Disclosure Statement.

Examination of the application and favorable action thereof is respectfully requested.

Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 01-2135 (501.37977CX3) and please credit any excess fees to such deposit account.

Respectfully submitted,



Melvin Kraus

Registration No. 22,466

ANTONELLI, TERRY, STOUT & KRAUS, LLP

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#3

501.37977CX3

J1050 U.S. PTO
10/19/1504
07/10/02

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): M. TAKAHASHI, et al

Serial No.: (not yet assigned)

Filed: July 10, 2002

For: METHOD AND APPARATUS FOR RECORDING AND REPRODUCING
VIDEO DATA, AND RECORDING MEDIUM

INFORMATION DISCLOSURE STATEMENT
UNDER 37 CFR 1.97 & 1.98

Commissioner for Patents
Washington, D.C. 20231

July 10, 2002

Sir:

In the matter of the above-identified application, this information disclosure statement is being submitted with the following citation as specified in 37 CFR 1.97(d).

"A copy of any patent, publication or other information listed in an information disclosure statement is not required to be provided if it was previously cited by or submitted to the Office in a prior application, provided that the prior application is properly identified in the statement and relied upon for an earlier filing date under 35 U.S.C. 120."

Applicant(s) are submitting herewith a copy of Form PTO-1449 which list documents cited in parent application(s) Serial No. 09/446,338, filed December 20, 1999

It is respectfully requested that this information disclosure statement be considered by the Examiner.

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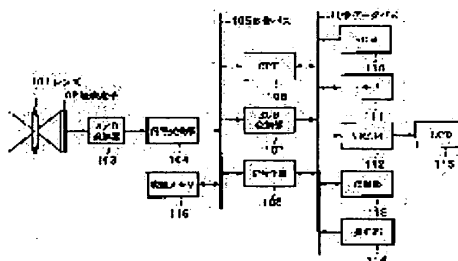
(72)Inventor : ISHIKAWA MOTOHIRO

(54) IMAGE PICKUP DEVICE AND ITS CONTROL METHOD

(57)Abstract:

PROBLEM TO BE SOLVED: To allow even an information processing unit having a different kind of environment to simply read and reproduce video data to be picked up.

SOLUTION: When an image pickup instruction (depression of a shutter) is received from an operation section 114, luminance and color difference data from a signal conversion section 104 are stored once in a video memory 116, the data are coded into data of the JPEG system by a coding section 108 and stored in a memory 111. Then the same video data stored in the video memory 116 are thinned this time, an RGB conversion section 107 converts the data form into the RGB form and the resulting data are stored in the memory 111. Then link information denoting the relation of the two coded data stored in the memory 111 is generated, and the link information and the coded data are unified and stored in a recording medium in a recording section 113.



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【特許請求の範囲】

【請求項1】 撮影した映像を電気信号に変換する撮像手段と、

前記撮像手段により撮像された映像データに対して異なる複数の符号化処理を行なう符号化手段と、

前記符号化手段によって得られた複数の符号化映像データの関連性を示すリンクデータを作成し、前記リンクデータと共に前記複数の符号化映像データを所定の記憶媒体に記憶保持させる制御手段とを有することを特徴とする撮像装置。

【請求項2】 前記複数の符号化処理とは前記映像データを符号化した際の符号量がそれぞれ異なるようにする処理であることを特徴とする請求項1に記載の撮像装置。

【請求項3】 前記符号化手段はJ P E G形式の符号化を行なうことを特徴とする請求項2に記載の撮像装置。

【請求項4】 前記符号化手段は、前記記憶媒体に記憶された映像データを間引きし、R G B形式のデータを生成することを特徴とする請求項1または2のいずれかに記載の撮像装置。

【請求項5】 前記記憶媒体は、装置に着脱自在であることを特徴とする請求項1乃至4のいずれかに記載の撮影装置。

【請求項6】 更に、前記撮像手段によって撮像された映像データを記憶し、その記憶された映像データを前記符号化手段に供給する記憶手段を有することを特徴とする請求項1乃至5のいずれかに記載の撮影装置。

【請求項7】 更に、前記撮像手段によって得られた映像を表示する表示手段と、
前記撮像手段によって撮像された映像データに基づいて前記表示手段に表示し得る形式のデータに生成する生成手段とを有することを特徴とする請求項1乃至6のいずれかに記載の撮像装置。

【請求項8】 更に、前記撮像手段によって撮像された映像データを前記記憶媒体上に記憶保持することを指示する指示手段を有し、

前記記憶手段、前記符号化手段及び前記制御手段は前記指示手段の指示があった場合に動作することを特徴とする請求項第6項に記載の撮像装置。

【請求項9】 前記指示手段による指示には、動画記憶保持指示と静止画記憶保持指示があつて、
前記動画記憶保持指示があつた場合には静止画記憶保持の場合よりも、高い圧縮率になる符号化を使用して前記映像データを前記記憶媒体に記憶保持させることを特徴とする請求項第8項に記載の撮像装置。

【請求項10】 前記指示手段によって前記静止画記憶保持指示があつた場合であつて、前記動画記憶保持動作を行なっている最中であれば待機し、動画記憶保持動作が完了した場合に前記記憶媒体に記憶保持させることを特徴とする請求項第9項に記載の撮像装置。

【請求項11】 撮影した映像を電気信号に変換する撮像工程と、

前記撮像工程により撮像された映像データに対して異なる複数の符号化映像データを所定の記憶媒体に記憶保持させる制御工程とを有することを特徴とする撮像装置の制御方法。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は撮像装置及びその制御方法に関するものである。

【従来の技術】デジタル形式の映像の撮影・記録では、大容量の映像信号を高速に伝送・記録する必要から、J P E G等の符号化圧縮技術によりその情報量を効率良く少なくし、かつ画質の劣化が少ない手法が用いられている。

【0002】このような符号化圧縮処理を行う撮影装置（デジタルカメラ）として、たとえば図2に示す構成を採用したとする。以下、同図に従って説明する。

【0003】撮影される映像は、レンズ101を通じて、ここではC C Dとしている撮像素子102上に結像され、光電変換により電気信号に変換され、更にA/D変換器103によりデジタル信号に変換される。このデジタル信号は、次段の信号変換部104により、輝度及び色差信号からなる映像信号に変換され、順次映像メモリ116に一時記憶される。1画面分の映像信号を映像メモリ116に記録した時点で、映像信号は任意の大きさのブロックを単位として符号化部108へ送られ、圧縮処理を施した符号化映像データに変換される。この符号化映像データは記録部113へ送られ、例えばメモ리카ード等の取り外し可能な記録媒体上に記録・保存される。

【0004】記録媒体上の映像データの再生は次のように行う。

【0005】記録媒体上のデータはC P U 106の制御により先ずメモリ111上に読み出され、順次符号化部108へ送られる。符号化部108では圧縮符号化された映像データを解凍または伸長し、輝度及び色差信号からなる映像信号に変換する。この映像信号は、R G B変換部107で表示用L C D 115で使用するデータ形式、ここではR G B形式に変換され、順次V R A M 112に記録される。V R A M 112上の信号は、任意のタイミングでL C D 115へ送られ、再生映像が観察者に対して表示される。

【0006】また、撮影された映像データは、この記録媒体を介して外部の機器へ転送する。外部機器側では、この記録媒体にアクセスするためのドライバを利用し、データの転送を行うが、媒体上のデータの記録形式が外部機器で直接扱うことのできない、異なった記録形式の場合には、データ形式の変換を同時に行い、変換されたデータを取り外し可能な記録媒体上または外部機器内の

記録媒体上に記録する。

【0007】

【発明が解決しようとする課題】さて、上述したように、撮影された映像データは取り外し可能な記録媒体上に記録されるが、ここでの記録形式は媒体の記録効率を高めるため、汎用性の低い高圧縮符号化方法を用いて記録されていた。このため、外部機器では媒体上のデータに対して変換処理を行う必要があり、この処理を行なうことができるドライバまたはソフトウェアを備える外部機器のみでしかデータを利用することができなかった。また、符号化された映像信号は、再生時には復号化する必要があり、高速な処理が行えなかった。

【0008】

【課題を解決するための手段】本発明はかかる点に鑑みなされたものであり、撮影した映像データを、異なる種類の環境を持った情報処理装置でも簡単に読み込み、再現することを可能ならしめる撮像装置及びその制御方法を提供しようとするものである。

【0009】この課題を解決するため、たとえば本発明の撮像装置は以下の構成を備える。すなわち、撮影した映像を電気信号に変換する撮像手段と、前記撮像手段により撮像された映像データに対して異なる複数の符号化処理を行なう符号化手段と、前記符号化手段によって得られた複数の符号化映像データの関連性を示すリンクデータを作成し、前記リンクデータと共に前記複数の符号化映像データを所定の記憶媒体に記憶保持させる制御手段とを有する。

【0010】

【発明の実施の形態】以下、添付図面に従って本発明に係る実施形態の一例を詳細に説明する。

【0011】実施形態における撮影装置のブロック構成を図1に示す。以下、各構成をその動作と共に説明する。

【0012】撮影者により撮影された映像は、レンズ101を通じて撮像素子102上に結像され、撮像素子102の光電効果によりアナログ電気信号に変換される。この信号は次段のA/D変換器103によりデジタル信号に変換される。デジタルデータは順次信号変換部104へ送られ、輝度及び色差信号からなる映像信号に変換され、映像バス105へ出力される。

【0013】撮影者が撮影する被写体を決定するためのフレーミングを行っている時点では、映像信号は表示のため映像バス105からRGB変換部107に入力されRGB形式の信号に変換する。そして、後段のデータバス109へ出力される。データバス109上の信号は、CPU106の制御によってVRAM112へ記録され、VRAM112からは任意のタイミングでデータをLCD115へ送り、撮影者に対して映像を表示する。

【0014】撮影者が被写体を決定し、記録のため操作部114上の図示しないシャッタースイッチを押した時

点で、映像信号の記録動作が開始される。シャッタースイッチを押した時点で撮影された輝度・色差信号からなる映像信号（信号変換部104の出力信号）は、そのまま記録媒体に記録することも可能であるが、後段の記録媒体上により多くのデータを記録するため、符号化圧縮処理を符号化部108で行い、データの冗長性を削減し、記録効率を上げている。この符号化処理のため、映像信号は一時的に映像メモリ116に記録される。

【0015】映像メモリ116内に一定量の映像データが記録された時点で、CPU106の制御により、映像信号に対し符号化部108に転送させ、第1の符号化処理が開始される。この第1の符号化処理は、撮影者が望む圧縮率・映像サイズ等のパラメータでの処理が行われる。なお、圧縮率等は、いわゆる装置に設けられたファインモードやノーマルモード等の設定によるものである。

【0016】映像信号に対する符号化圧縮処理としては、ここでは例としてJPEG形式に基づいたDCT（離散コサイン変換）及びHuffman変換を行う。輝度及び色差信号からなる映像信号が1画面分映像メモリ116に記録された時点で符号化圧縮処理が開始される。映像信号は符号化部108へ送られるが、DCT処理のため輝度信号は縦8×横16画素、色差信号は8×8画素を最小単位として、ラスタスキャンからジグザグスキャンへ変換して映像メモリ116より読み出される。DCT及びHuffman変換それ自身は公知であるので、その説明は省略する。符号化部108で必要となる、圧縮率・記録する映像の大きさ・出力データ形式等の設定は、撮影前に撮影者によって設定されていた値を、シャッタースイッチが押された時点でCPU106が符号化部108へ送ることで行っている。

【0017】映像信号は符号化部108へ入力された時点で、順次符号化処理を施され、データバス109へ送られ、後段のメモリ111へ一時的に記録される。以上の処理を繰り返し、1画面分全ての映像信号の符号化処理を行う。この処理の前後、CPU106は必要ならば符号化映像データに対して任意の形式のヘッダ・フッタ（たとえば撮影日時情報等）を生成し、映像データと共にメモリ111上に記録する。

【0018】さて、上述した第1の符号化処理が終了した時点では、前段の映像メモリ116には符号化処理前の輝度・色差信号からなる映像信号データが、後段のメモリ111には撮影者が設定したパラメータによる符号化処理を受けた第1の符号化データ303が保持されている。

【0019】そこで、第1の符号化処理が終了すると、再び前段の映像メモリ116内の映像信号データに対して第2の符号化処理を開始する。この第2の符号化処理は、撮影装置自身が映像の再生表示時に扱いやすい、または映像データが外部機器に受け渡された場合に必要と

なる形式で映像信号を変換する処理である。ここでは第1の符号化処理で用いられたデータ量に比べて映像のサイズを間引きした小さな画像を、RGB形式に変換した映像データを生成する処理としている。また、ここにデータ量を小さくするために汎用性の高い符号化処理を加えることも可能である。この第2の符号化処理では、撮影者の設定した符号化パラメータに関らず、予め装置内のROM110に記録されたパラメータをCPU106が読み出し、これに基づいて第1の符号化処理が行われた同一の映像信号に対して再度符号化処理を行う。

【0020】第2の符号化処理では、先ず映像メモリ116内に保持されている映像信号から、CPU106の制御により、補間等の任意の方法を用いてそのサイズを小さくした映像信号を生成する。この信号は順次RGB変換部107へ送られ、輝度・色差形式からRGB形式へ変換され、後段のメモリ111に一時記録される。この時、第1の符号化処理の場合と同様に、CPU106は必要に応じてRGB信号データのヘッダ・フッタを生成、共に記録する。

【0021】第2の符号化処理を終了した時点では、前段の映像メモリ116には符号化処理前の輝度・色差信号からなる映像信号データが、後段のメモリ111には撮影者が設定したパラメータによる第1の符号化処理を受けた第1の符号化データ303と、予め決められた形式による第2の符号化処理を受けた第2の符号化データ304とが保持されている。この後、更に同一の映像信号を用いて、符号化時の圧縮率のみを変化させたもの、輝度情報のみを符号化したもの等、第nの符号化形式による第nの符号化データの生成も可能であるが、ここでは以上の2つの形式による符号化データを記録部113上の取り外し可能な記録媒体上に記録する。

【0022】記録時、CPU106はメモリ111上の2つの符号化データを記録部113内の記録媒体上に記録する前に、2つの符号化データの関連性を示すリンクデータを生成し、メモリ111上に記録する。この2つの符号化データ及びリンクデータを、想定する外部機器が読むことのできる、図3に示す形式で記録部113内の記録媒体上へ記録する。この場合、第2の符号化データ304は、第1の符号化データ303のデータ量削減版であるサムネイルデータという位置付けをされて記録される。データの記録後は次の撮影に備えるため前後のメモリ内のデータを破棄し、再びフレーミング動作に戻る。

【0023】なお、実施形態における記録媒体は、たとえば、メモリカード、磁気ディスク（ハードディスク等）、磁気テープ等いかなるものでもよい。

【0024】上記処理はCPU106が制御実行することで達成されるが、このプログラムはROM110に格納されており、整理して説明すれば図5のようになる。なお、同図のフローチャートは操作部114のシャッタス

イッチが操作された場合の処理である。

【0025】先ず、ステップS1においては、信号変換部104から得られた1画面分の輝度及び色差のデジタルデータを映像メモリ116に格納させる。次いで、ステップS2に進み、操作部114で指定されたモード（たとえばファインモードやノーマルモード等）に対応するパラメータをROM110から読み込み、符号化部108にセットし、映像メモリ116内の所定ブロック単位のデータを符号化部108に転送させ、符号化を行わせる。先に説明したように実施形態では、JPEG形式に基づいたDCT（離散コサイン変換）及びHuffman変換を行うことになる。こうして得られた符号化データを第1の符号化データとしてメモリ111に一旦格納させる（ステップS3）。

【0026】次いで、ステップS4に進み、映像メモリ116から輝度データ及び色差データを間引きして読み込み、RGB変換部107でRGB形式のデータを作成させ、ステップS5で、生成されたデータを第2の符号化データとしてメモリ111に格納する。

【0027】この後、ステップS6において、上記のようにしてメモリ111に格納された2つの符号化データのリンクデータを生成し、ステップS7において最終的に記録部113に搭載された取り外し可能な記憶媒体に記憶保存させる。

【0028】次に、記録媒体上に記録された映像データ301を再生する処理について述べる。記録した映像の表示では、ここではRGB形式で記録されている第2の符号化データ304をそのまま用いる。撮影者から記録した任意の映像の表示の指示が操作部114より入力されると、CPU106は記録媒体上の指示された映像データを検索し、その中の第2の符号化データ304をメモリ111上に読み込む。そして、第2の符号化データ304の持つ画素数が、表示用LCD115の必要とする画素数に一致する場合は、メモリ111上のデータはLCD115のRGB各画素の並びに合致するように順序を入れ替えられ、VRAM112に記録、任意のタイミングでVRAM112からLCD115へデータを転送・表示する。第2の符号化データ304の持つ画素数が、表示用LCD115の必要とする画素数に一致しない場合は、符号化データに対してCPU106が拡大・縮小のための補間処理を行った後、VRAM112へ記録、LCD115へ映像の表示を行う。第2の符号化データ304が何らかの圧縮処理を施されていた場合は、CPU106がこの符号化データを伸長もしくは解凍した後、同様の処理を行うことで映像の表示を行う。

【0029】この場合、第2の符号化データ304は第1の符号化データ303に比べ画像サイズが小さいため、表示処理を素早く行うことができ、また使用するメモリ領域も小さいため、後段のメモリ111の大きさを小さくすることも可能である。

【0030】次に、記録した映像データ301を、取り外し可能な記録媒体を介して外部機器、ここでは任意のOSが動作するコンピュータ上へ転送する場合の処理について述べる。記録媒体からコンピュータへデータを転送する場合、OSによって一つのデータファイルに対して必要とされる情報量が異なる場合があり、例えばあるOSでは映像データ単独での読み込みが可能だが、違うOSでは映像データの他にアイコンやサムネイル用のデータやアプリケーションとの関連づけを示すものが必要となる。この様なOSの差に対しては、第1、第2の符号化データを、それぞれのOSが必要とするデータに対応させることで後の処理を不必要とすることができる。この場合、映像データ単独での取込可能なOSでは、映像データとして第1、第2の符号化データの二つの情報が利用できることになる。この様な形式で予め記録媒体上に記録することにより、データの取り込の際に余分なドライバまたはアプリケーションを利用する必要がなくなり、簡単にデータの転送を実現でき、汎用性の高い記録媒体の利用ができる。

【0031】以上説明したように本実施形態に従えば、撮影された映像データを汎用性のあるデータと装置自身に都合が良いデータの2つ、或いは、それ以上の形式のデータとして記憶媒体に記憶させることで、この記憶媒体内の同じ映像データを表示する側にとってはいずれかの映像データを読み出して表示させれば良くなり、専用のドライバ等は不要になる。

【0032】なお、上記実施形態では、映像メモリ116に映像データが格納された後、第1の符号化、第2の符号化の順で処理したが、この順序は逆であっても良いし、3以上の符号化する場合には如何なる順序で行ってもよい。なぜなら、これらの処理はいずれも、映像メモリ116に格納されているデータに対し行っているからである。

【0033】また、上記実施形態では、記録部113のデータを着脱自在であるものとして説明したが、たとえば通信インタフェースを備え、指示された形式の符号化データをその通信インタフェースに接続した上位装置に転送しても構わない。

【0034】この場合には、上位装置からの所定指示に従って、記憶保持されているデータ一覧を送信する手段、及び、転送するデータ形式を示す指示に従って、指示されたデータ中の対応する形式のデータを転送する手段を備えればよい。

【0035】＜第2の実施形態＞次に、第2の実施形態について説明する。

【0036】本第2の実施形態では、一つの撮像素子で動画・静止画同時対応可能な例を示す。図4に第2の実施形態に係わる撮影装置のブロック構成を示す。

【0037】先ず撮影された影像是、レンズ101を通じて撮像素子102上に結像され、撮像素子102の光

電効果によりアナログ電気信号に変換される。この信号は次段のA/D変換器103によりデジタル信号に変換される。デジタルデータは順次信号変換部104へ送られ、輝度及び色差信号からなる映像信号に変換され、映像バス105へ出力される。映像バス105上の信号は、CPU106の制御によりRGB変換部107へ送られ、RGB形式に変換された後にVRAM112へ順次記録され、任意のタイミングでVRAM112からLCD115へデータが送られ、撮影した映像が撮影者に表示される。記録の際は、操作部114上の不図示の動画記録スイッチ及び静止画記録スイッチを撮影者が押すことにより、動画及び静止画を区別して同時に記録することができる。この処理は、動画と静止画の場合に分けて以下に説明する。

【0038】先ず動画の撮影の場合であるが、映像バス105上の信号は順次第1符号化部401へ送られる。ここで、輝度・色差からなる映像信号は第1の実施形態で述べたのと同様に、JPEG形式で記録するための変換(DCT及びHuffman変換)を受ける。第1符号化部401には、映像バス105からラスタ形式に入力される信号をブロック変換(ジグザグスキャン)するための専用のメモリ402が付けられており、順次流れてくるデータは、ある大きさ以下の映像ならば時間的なロス無しで符号化することができる。記録する画像の大きさは事前に撮影者が設定するが、動画の記録の際は上述した画像の大きさに対して制限が加わった範囲内で設定することになる。従って、第1符号化部401は、映像バス105を流れるデータから、必要な領域のデータのみを取り込むことになる。

【0039】また、リアルタイムでの符号化処理及び記録を達成するため、映像信号の圧縮率は予め高く設定してある。リアルタイム符号化処理を受け、第1符号化部401から出力された動画データは、CPU106の制御に基づいて、動画像用の形式で直接記録部113内の記録媒体上に記録される。また、記録の前後に際して、必要ならばCPU106は動画データのヘッダ及びフッタを生成、記録される動画データに関連づけて任意の位置に記録しておく。動画の記録中も、映像バス105上の信号はRGB変換部107へ同時に送られ、撮影中の映像を撮影者に対してリアルタイムで表示する。

【0040】次に静止画の記録について述べる。撮影者により操作部114に設けられている静止画記録スイッチが押されると、まず第2符号化部403に接続されている専用メモリ404内に、映像バス105上の輝度・色差信号からなる映像信号を、任意のタイミングから開始して1画面分取り込む。この時の映像信号の大きさは、動画撮影の時と同様に撮影者が事前に設定しておくが、静止画記録では上述したように映像信号を符号化処理する前に全てメモリ404上に取り込むため、リアルタイムでの処理が必要なく、従って映像のサイズは使用

している撮像素子102の大きさまたは専用のメモリの容量以下で自由に選ぶことができる。メモリ404に記録された映像信号は、第2符号化部403において、ここでは第1符号化部401と同様のJPEG形式で記録するための変換を受けるが、ここでも動画撮影とは異なり、リアルタイムでのデータ転送及び記録を必要としないため、第1符号化部401での設定に比べて圧縮率は低くでき、高画質での映像信号を行うことができる。第2符号化部403で変換された静止画データは、CPU106とは別のメモリコントロール部406の制御によって、デュアルポートメモリ405へ一時的に記録される。

【0041】媒体への記録は、静止画記録動作が動画記録動作と同時に起こっていない場合は、直ちにCPU106の制御により記録動作が行われる。先ず符号化された静止画データがデータバス109を介してメモリ111上に記録される。この静止画データに、CPU106は必要なヘッダ及びフッタを生成し、これを一つのデータファイルとして記録媒体上に記録する。

【0042】静止画記録動作が動画記録動作と同時に起こっている場合の処理は以下になる。メモリコントロール部406は、動画撮影が終了するまで静止画データをデータバス109上へは出力せず、待機状態とする。この間に、更に静止画撮影が行われた場合、デュアルポートメモリ405の容量の限界まで、順次静止画データを記録する。デュアルポートメモリ405が一杯になった場合、これ以上の記録は受け付けない。動画記録が終了した後、メモリコントロール部406は静止画データの記録要求をCPU106に対して行うことで、以降の処理をCPU106へ渡す。CPU106では、デュアルポートメモリ405内に複数枚の静止画データが存在する場合は、順次ヘッダ及びフッタを生成、記録媒体上へ記録を行う。この時、一連の動画像との関連性を示すリンクデータを生成し共に記録する。この静止画記録中においては、第1の実施形態で述べたような圧縮率、画像サイズ等の異なるLCD115表示用またはサムネイル用の小さな画像データを同時に生成することも可能である。

【0043】また、動画像記録中において、同時に静止画記録処理が生じていない場合、CPU106は任意のタイミングで上述したLCD115表示用またはサムネイル用の小さな画像データを動画像用に生成することも可能である。この場合も前述したように一連の動画像との関連性を示すリンクデータを同時に生成、記録する。

【0044】以上述べたように、本第2の実施形態では、映像を撮影するための撮像素子が一つしかない場合においても、同一の映像信号から符号化方式の異なる動画像及び静止画像の記録を行うことができる。

【0045】なお、本発明は、複数の機器（例えばカメラ、記録部等）から構成されるシステムに適用しても、

一つの機器からなる装置（例えば、デジタルカメラ装置）に適用してもよい。

【0046】また、本発明の目的は、前述した実施形態の機能を実現するソフトウェアのプログラムコードを記録した記憶媒体を、システムあるいは装置に供給し、そのシステムあるいは装置のコンピュータ（またはCPUやMPU）が記憶媒体に格納されたプログラムコードを讀出し実行することによっても、達成されることは言うまでもない。

【0047】この場合、記憶媒体から讀出されたプログラムコード自体が前述した実施形態の機能を実現することになり、そのプログラムコードを記憶した記憶媒体は本発明を構成することになる。

【0048】プログラムコードを供給するための記憶媒体としては、例えば、フロッピディスク、ハードディスク、光ディスク、光磁気ディスク、CD-ROM、CD-R、磁気テープ、不揮発性のメモリカード、ROMなどを用いることができる。

【0049】また、コンピュータが讀出したプログラムコードを実行することにより、前述した実施形態の機能が実現されるだけでなく、そのプログラムコードの指示に基づき、コンピュータ上で稼働しているOS（オペレーティングシステム）などが実際の処理の一部または全部を行い、その処理によって前述した実施形態の機能が実現される場合も含まれることは言うまでもない。

【0050】さらに、記憶媒体から讀出されたプログラムコードが、コンピュータに挿入された機能拡張ボードやコンピュータに接続された機能拡張ユニットに備わるメモリに書込まれた後、そのプログラムコードの指示に基づき、その機能拡張ボードや機能拡張ユニットに備わるCPUなどが実際の処理の一部または全部を行い、その処理によって前述した実施形態の機能が実現される場合も含まれることは言うまでもない。

【0051】以上述べたように、実施形態の撮影装置によれば、撮影時に同一の映像信号から符号化時の条件の異なる複数の符号化された映像データを生成することで、撮影装置内での映像の再生時等に生ずる処理の負担を軽減することができ、内部での高速な処理を実現でき、利用者の操作性を向上することができる。

【0052】また、記録媒体に記録した後の外部機器へのデータ転送においても、データ変換等の特別な処理を必要とせず、容易にデータ転送を行うことができることから、専用のドライバ等を備えていない外部機器においてもデータの転送ができ、汎用性の高い記録媒体の利用方法を実現できる。

【0053】

【発明の効果】以上説明したように本発明によれば、撮影した映像データを、異なる種類の環境を持った情報処理装置でも簡単に読み込み、再現させることが可能になる。

【0054】

【図面の簡単な説明】

【図1】本発明の第1の実施形態を示すブロック図である。

【図2】従来例を示すブロック図である。

【図3】第1の実施形態での第1・第2の符号化データ及びリンクデータの関係を示す図である。

【図4】本発明の第1の実施形態を示すブロック図である。

【図5】第1の実施形態における動作処理手順を示すフローチャートである。

【符号の説明】

101 レンズ

102 撮像素子

103 A/D変換器

104 信号変換部

105 映像バス

106 CPU

107 RGB変換部

108 符号化部

109 データバス

110 ROM

111 メモリ

112 VRAM

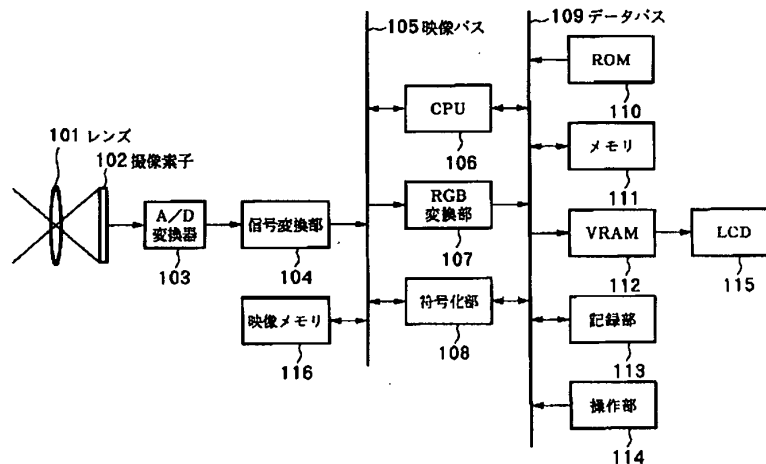
113 記録部

114 操作部

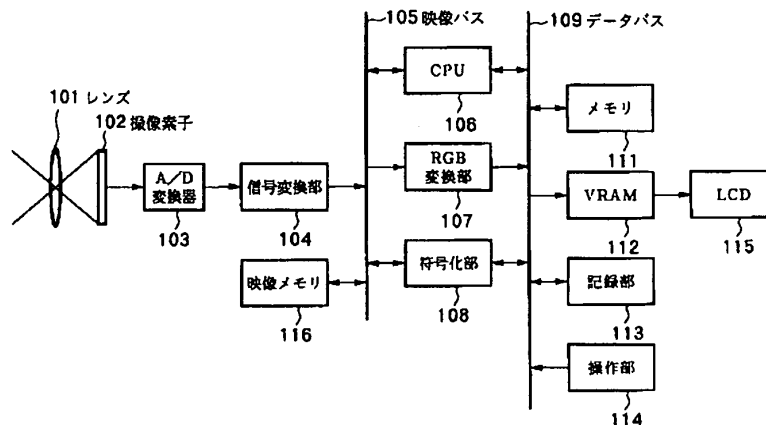
115 LCD

116 映像メモリ

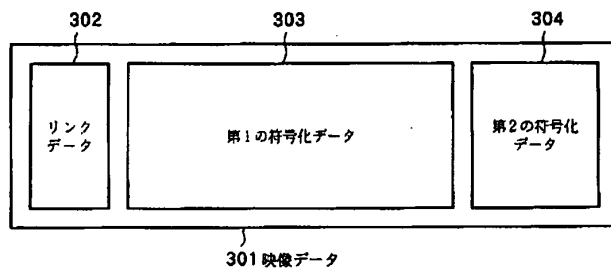
【図1】



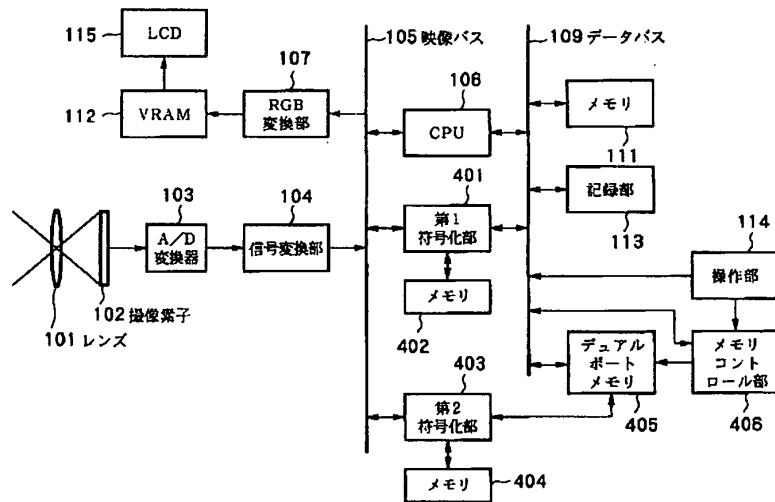
【図2】



【図3】



【図4】



【図5】

