

Exhibit 848-06 – Invalidity of U.S. Patent No. 10,176,848 in view of Nakashima

This chart pertains to U.S. Patent No. 10,176,848 (the “’848 patent”). This chart is subject to all reservations, objections, and disclaimers in Samsung’s Invalidity Contentions and any amendment, supplement, or modification thereof, which are incorporated herein by reference in their entirety. This chart refers to the following prior art references:

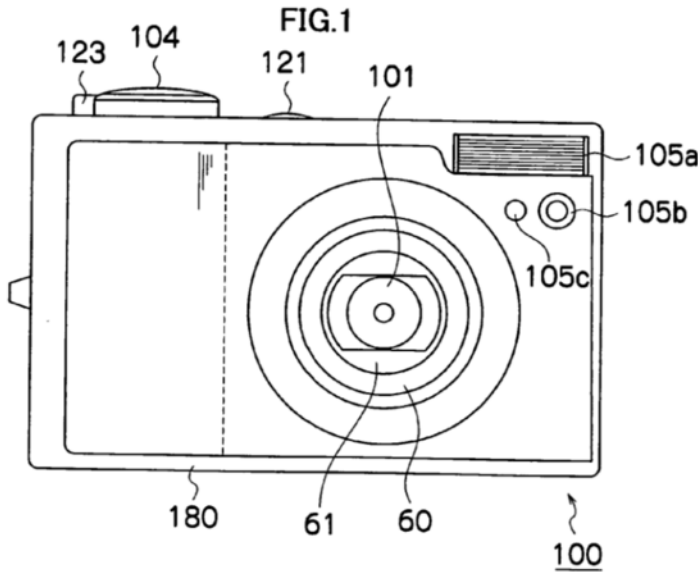
US20070019083A1 (“Nakashima”) was filed on July 10, 2006 and published January 25, 2007 and therefore qualifies as prior art to the ’848 patent under at least pre-AIA 35 U.S.C. § 102(b).

Discovery is ongoing and Samsung will update this chart pursuant to Federal Rule of Civil Procedure 26(e), the Local Rules, and the Orders of record in this matter subject to further investigation and discovery regarding the reference, the Court’s construction of the claims at issue, and discovery generally, including third-party discovery.

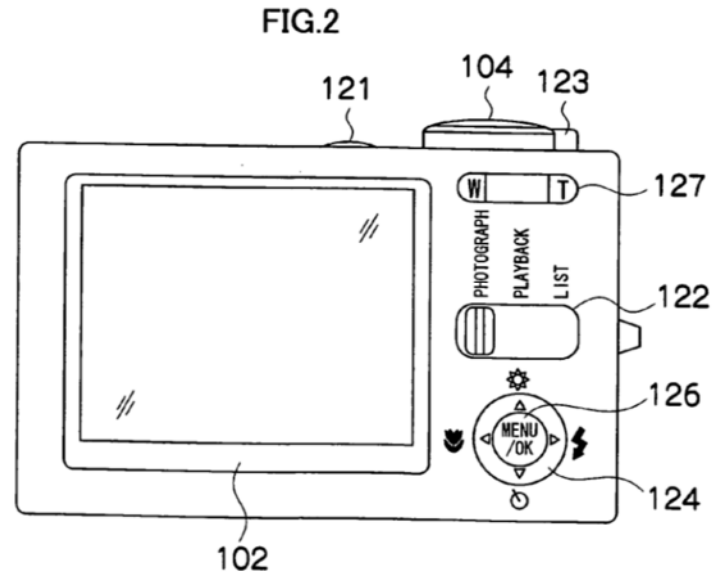
Nakashima anticipates the Asserted Claims of the ’848 Patent (claims 11, 12, 16, 17, 19, 20, and 84, as set forth in Maxell’s infringement contentions, served on January 11, 2024). To the extent it is found Nakashima does not expressly disclose certain limitations in the Asserted Claims, Nakashima renders obvious the Asserted Claims, either alone or in combination with other prior art identified in the cover pleading or herein, and/or in combination with the general knowledge of a person having ordinary skill in the art. In these contentions, Samsung has relied in part on Maxell’s infringement contentions. In those contentions, Maxell appears to pursue overly broad claim constructions in an effort to assert infringement where none exists and to accuse products that do not infringe the claims. Samsung’s assertion that a particular limitation is disclosed by a prior art reference and/or is disclosed in a particular manner may be based in part on Maxell’s apparent claim interpretations. Samsung does not admit that Maxell’s apparent claim interpretations are supportable or proper or that the claim limitations in question are definite or otherwise amenable to construction.

Samsung has endeavored to cite to the most relevant portions of the identified prior art, but other portions of the identified prior art may additionally disclose, either expressly or inherently, and/or render obvious one or more limitations of the asserted claims. The inclusion of specific details in some areas is not a concession that such details are required or that the omission of similar details in other areas is a defect. These citations to portions of any reference in this chart are exemplary only. Thus, Samsung reserves the right to rely on: (1) uncited portions of the identified prior art; (2) other prior art not identified herein; (3) references that show the state of the art (irrespective of whether such references themselves qualify as prior art to the asserted patents); (4) factual testimony from the inventors or authors of the prior art references, or purveyors of prior art devices; and/or (5) expert testimony, to provide context to or aid in understanding the prior art and the state of the art at the time of the alleged inventions.

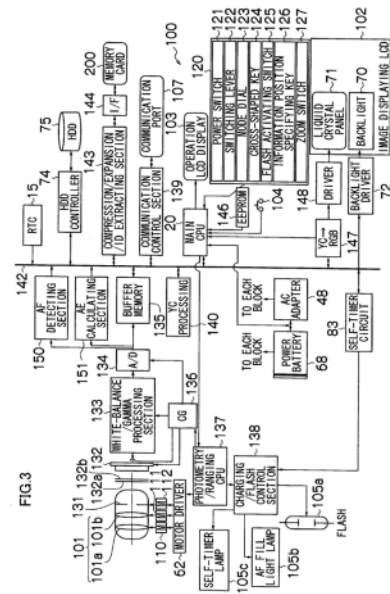
’848 Patent Claim Limitation	Nakashima Exemplary Disclosure
[8pre] 8. A recording and reproducing apparatus for recording and reproducing image information, comprising:	To the extent the preamble is limiting, Nakashima discloses “[a] recording and reproducing apparatus for recording and reproducing image information.” For example: Nakashima at Abstract An image capturing apparatus comprising: an image capturing element which receives subject light incident via a photographing lens, converts the subject light into a captured image signal, and outputs the signal; an A/D conversion section which converts the captured image signal outputted by the image capturing element into image data and outputs the image data; a storage section which stores at least the

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	image data outputted by the A/D conversion section; a registration section which relates identification facial images which are image data to be used as criteria for identifying faces of subjects among the image data stored in the storage section to identification information of each subject, and registers related data into a database; a facial image extraction section which extracts facial images which are facial portion regions of a person from photographed images which are desired image data outputted by the A/D conversion section and stored in the storage section; an identification section which identifies from the database an identification facial image matching an extracted facial image which is a facial image extracted by the facial image extraction section; and a photograph quantity calculation section which calculates for each subject identification information a photograph quantity which is the total number of photographed images from which an extracted facial image matching an identification facial image corresponding to identification information for each subject has been extracted. Nakashima at Fig. 1 

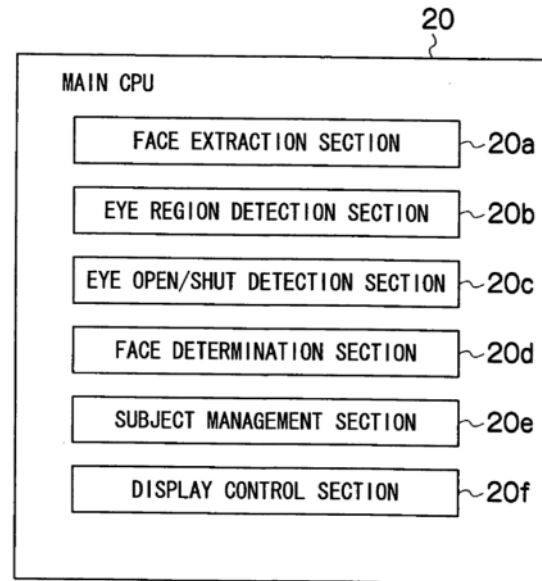
Nakashima at Fig. 2



Nakashima at Fig. 3



Nakashima at Fig. 4



Nakashima at [0004]

Conventionally, techniques have existed which allow a user to know who is captured in a photographed image. For instance, a digital camera disclosed in Japanese Patent Application Laid-Open 2004-62868 comprises: a photosensor configured to capture images; an access device for accessing a face database used for storing names and face identification information related to individuals; a processor configured to evaluate loaded images to locate faces, and match the located faces to face identification information stored in the face database; and a communication device for communicating with a user, configured to request the name of a person when the face in an image does not match the face stored in the face database at the present moment.

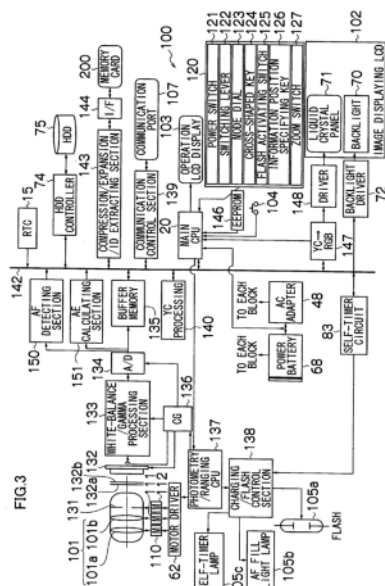
Nakashima at [0005]–[0006]

With events such as school events, there is a need to be able to photograph each and every person to be photographed as subjects, such as students or children, in a uniform manner, or so that a certain photograph quantity will be taken for each subject. In this regard, the technique disclosed in Japanese Patent Application Laid-Open No. 2004-62868 merely requires that names are attached to faces which are detected a predefined number of times or more, and therefore is not useful towards equalizing the number of photographs taken.

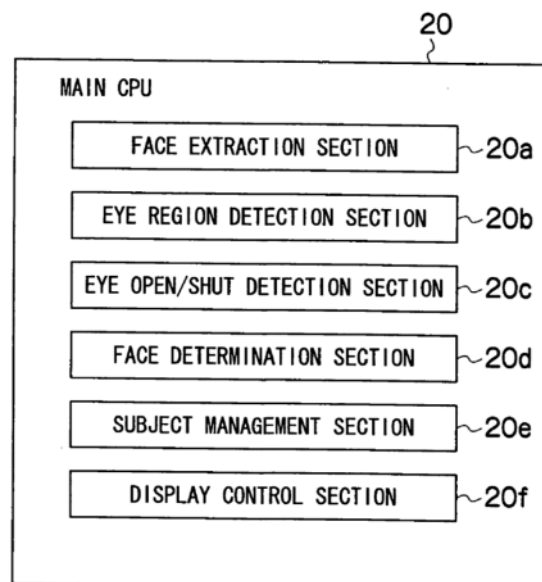
'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	The present invention has been made in consideration of the above problem, and its object is to prevent, as much as possible, bias among the number of photographs taken for subjects by managing the number of photographs taken for each subject. Nakashima at [0007] In order to solve the above problem, an image capturing apparatus according to the present invention comprises: an image capturing element which receives subject light incident via a photographing lens, converts the subject light into a captured image signal, and outputs the signal; an A/D conversion section which converts the captured image signal outputted by the image capturing element into image data and outputs the image data; a storage section which stores at least the image data outputted by the A/D conversion section; a registration section which relates identification facial images which are image data to be used as criteria for identifying faces of subjects among the image data stored in the storage section to identification information of each object, and registers related data into a database; a facial image extraction section which extracts facial images which are facial portion regions of a person from photographed images which are desired image data outputted by the A/D conversion section and stored in the storage section; an identification section which identifies from the database an identification facial image matching an extracted facial image which is a facial image extracted by the facial image extraction section; and a photograph quantity calculation section which calculates for each subject identification information a photograph quantity which is the total number of photographed images from which an extracted facial image matching an identification facial image corresponding to identification information for each subject has been extracted. Nakashima at [0072] FIG. 1 is a front view of a digital camera (hereinafter abbreviated as “camera”) 100 according to a preferred embodiment of the present invention. Nakashima at [0078] FIG. 2 is a rear view of the camera 100. Nakashima at [0079] An image displaying LCD 102, a switching lever 122, a cross-shaped key 124, an information position specifying key 126 and the like are also provided on the rear face of the camera 100. The cross-shaped key 124 is an operation system in which up, down, left and right respectively set display brightness adjustment/self-timer/macro photography/flash photography. Although a description will be provided later, pressing the down key of the cross-shaped key 124 enables setting of a self photographing mode,

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	where a main CPU 20 causes a CCD 132 to perform shutter operations after conclusion of a clocking operation by a self-timer circuit 83. To the extent Maxell contends Nakashima does not disclose this limitation, a person of ordinary skill in the art would have readily arrived at this limitation by combining or modifying it in view of their general knowledge and/or the prior art references disclosed in the corresponding section of Samsung's Invalidity Contentions.
[8a] a processor; and	Nakashima discloses "a processor." For example: Nakashima at Abstract An image capturing apparatus comprising: an image capturing element which receives subject light incident via a photographing lens, converts the subject light into a captured image signal, and outputs the signal; an A/D conversion section which converts the captured image signal outputted by the image capturing element into image data and outputs the image data; a storage section which stores at least the image data outputted by the A/D conversion section; a registration section which relates identification facial images which are image data to be used as criteria for identifying faces of subjects among the image data stored in the storage section to identification information of each subject, and registers related data into a database; a facial image extraction section which extracts facial images which are facial portion regions of a person from photographed images which are desired image data outputted by the A/D conversion section and stored in the storage section; an identification section which identifies from the database an identification facial image matching an extracted facial image which is a facial image extracted by the facial image extraction section; and a photograph quantity calculation section which calculates for each subject identification information a photograph quantity which is the total number of photographed images from which an extracted facial image matching an identification facial image corresponding to identification information for each subject has been extracted.

Nakashima at Fig. 3



Nakashima at Fig. 4



Nakashima at [0004]

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Nakashima at [0007]

In order to solve the above problem, an image capturing apparatus according to the present invention comprises: an image capturing element which receives subject light incident via a photographing lens, converts the subject light into a captured image signal, and outputs the signal; an A/D conversion section which converts the captured image signal outputted by the image capturing element into image data and outputs the image data; a storage section which stores at least the image data outputted by the A/D conversion section; a registration section which relates identification facial images which are image data to be used as criteria for identifying faces of subjects among the image data stored in the storage section to identification information of each object, and registers related data into a database; a facial image extraction section which extracts facial images which are facial portion regions of a person from photographed images which are desired image data outputted by the A/D conversion section and stored in the storage section; an identification section which identifies from the database an identification facial image matching an extracted facial image which is a facial image extracted by the facial image extraction section; and a photograph quantity calculation section which calculates for each subject identification information a photograph quantity which is the total number of photographed images from which an extracted facial image matching an identification facial image corresponding to identification information for each subject has been extracted.

Nakashima at [0056]

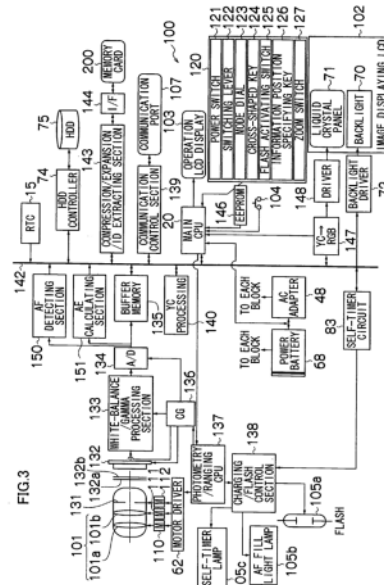
Various circuits such as CPUs (central processing units) and ASICs may be used as the processing unit.

Nakashima at [0108]

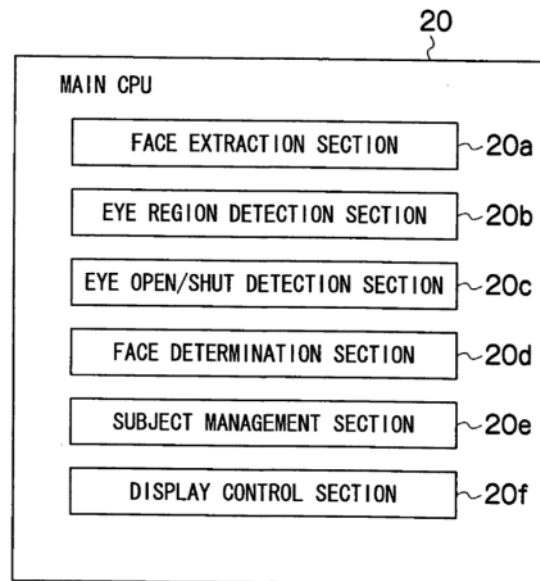
The camera 100 is also provided with the main CPU 20, an EEPROM 146, a YC/RGB conversion section 147, and a display driver 148. The main CPU 20 provides overall control of the camera 100. Individual data and programs unique to the camera 100 are stored in the EEPROM 146. The YC/RGB

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	conversion section 147 converts color image signals generated at the YC processing section 140 into trichromatic RGB signals, and outputs the converted signals to the image displaying LCD 102 via the display driver 148. Nakashima at [0115] FIG. 4 is a diagram conceptually illustrating a program executed by the main CPU 20. The main CPU 20 reads out: a face extraction section 20a; an eye region detection section 20b; an eye open/shut detection section 20c; a face determination section 20d; an object management setting section 20e; and a display control section 20f; which are programs stored in a computer readable storage media such as the EEPROM 146 or the hard disk 75, to a volatile memory (RAM or the like) and executes the programs. These programs may also be referred to as simply “program”. To the extent Maxell contends Nakashima does not disclose this limitation, a person of ordinary skill in the art would have readily arrived at this limitation by combining or modifying it in view of their general knowledge and/or the prior art references disclosed in the corresponding section of Samsung’s Invalidity Contentions.
[8b] a memory coupled to the processor and storing instructions that, when executed by the processor, cause the processor to:	Nakashima discloses “a memory coupled to the processor and storing instructions” therefor. For example: Nakashima at Abstract An image capturing apparatus comprising: an image capturing element which receives subject light incident via a photographing lens, converts the subject light into a captured image signal, and outputs the signal; an A/D conversion section which converts the captured image signal outputted by the image capturing element into image data and outputs the image data; a storage section which stores at least the image data outputted by the A/D conversion section; a registration section which relates identification facial images which are image data to be used as criteria for identifying faces of subjects among the image data stored in the storage section to identification information of each subject, and registers related data into a database; a facial image extraction section which extracts facial images which are facial portion regions of a person from photographed images which are desired image data outputted by the A/D conversion section and stored in the storage section; an identification section which identifies from the database an identification facial image matching an extracted facial image which is a facial image extracted by the facial image extraction section; and a photograph quantity calculation section which calculates for each subject identification information a photograph quantity which is the total number of photographed images from which an extracted facial image matching an identification facial image corresponding to identification information for each subject has been extracted.

Nakashima at Fig. 3



Nakashima at Fig. 4



Nakashima at [0004]

Conventionally, techniques have existed which allow a user to know who is captured in a photographed image. For instance, a digital camera disclosed in Japanese Patent Application Laid-Open 2004-62868 comprises: a photosensor configured to capture images; an access device for accessing a face database used for storing names and face identification information related to individuals; a processor configured to evaluate loaded images to locate faces, and match the located faces to face identification information stored in the face database; and a communication device for communicating with a user, configured to request the name of a person when the face in an image does not match the face stored in the face database at the present moment.

Nakashima at [0007]

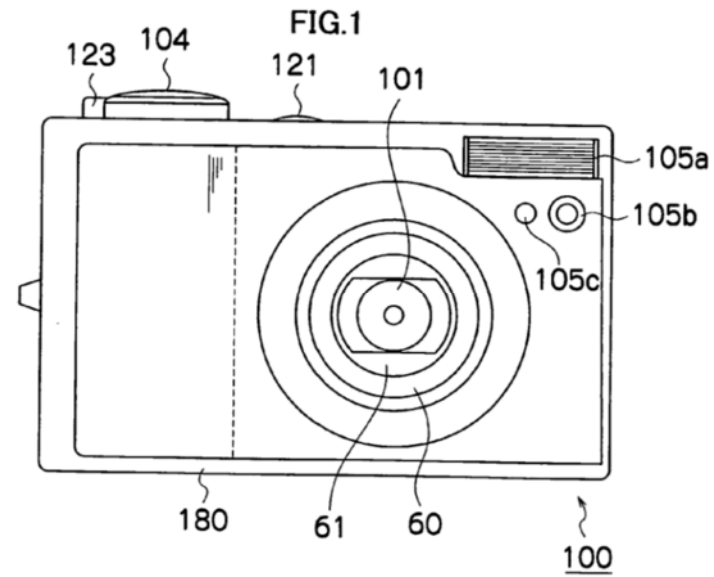
In order to solve the above problem, an image capturing apparatus according to the present invention comprises: an image capturing element which receives subject light incident via a photographing lens, converts the subject light into a captured image signal, and outputs the signal; an A/D conversion section which converts the captured image signal outputted by the image capturing element into image data and outputs the image data; a storage section which stores at least the image data outputted by the A/D conversion section; a registration section which relates identification facial images which are image data to be used as criteria for identifying faces of subjects among the image data stored in the storage section to identification information of each object, and registers related data into a database; a facial image extraction section which extracts facial images which are facial portion regions of a person from photographed images which are desired image data outputted by the A/D conversion section and stored in the storage section; an identification section which identifies from the database an identification facial image matching an extracted facial image which is a facial image extracted by the facial image extraction section; and a photograph quantity calculation section which calculates for each subject identification information a photograph quantity which is the total number of photographed images from which an extracted facial image matching an identification facial image corresponding to identification information for each subject has been extracted.

Nakashima at [0115]

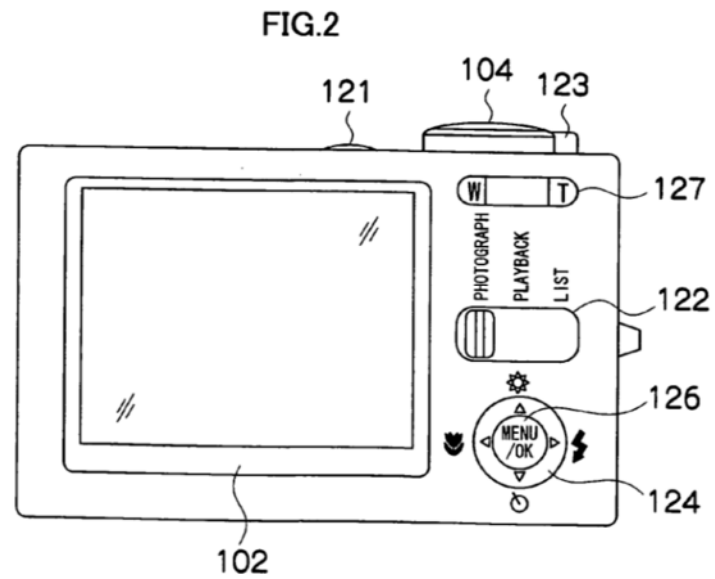
FIG. 4 is a diagram conceptually illustrating a program executed by the main CPU 20. The main CPU 20 reads out: a face extraction section 20a; an eye region detection section 20b; an eye open/shut detection section 20c; a face determination section 20d; an object management setting section 20e; and a display control section 20f; which are programs stored in a computer readable storage media such as the EEPROM 146 or the hard disk 75, to a volatile memory (RAM or the like) and executes the programs. These programs may also be referred to as simply “program”.

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	To the extent Maxell contends Nakashima does not disclose this limitation, a person of ordinary skill in the art would have readily arrived at this limitation by combining or modifying it in view of their general knowledge and/or the prior art references disclosed in the corresponding section of Samsung's Invalidity Contentions.
[8c] capture a photograph and generate image information of the photograph;	Nakashima discloses “capture a photograph and generate image information of the photograph.” For example: Nakashima at Abstract An image capturing apparatus comprising: an image capturing element which receives subject light incident via a photographing lens, converts the subject light into a captured image signal, and outputs the signal; an A/D conversion section which converts the captured image signal outputted by the image capturing element into image data and outputs the image data; a storage section which stores at least the image data outputted by the A/D conversion section; a registration section which relates identification facial images which are image data to be used as criteria for identifying faces of subjects among the image data stored in the storage section to identification information of each subject, and registers related data into a database; a facial image extraction section which extracts facial images which are facial portion regions of a person from photographed images which are desired image data outputted by the A/D conversion section and stored in the storage section; an identification section which identifies from the database an identification facial image matching an extracted facial image which is a facial image extracted by the facial image extraction section; and a photograph quantity calculation section which calculates for each subject identification information a photograph quantity which is the total number of photographed images from which an extracted facial image matching an identification facial image corresponding to identification information for each subject has been extracted.

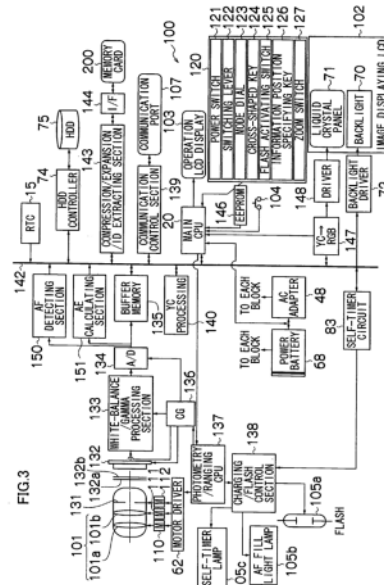
Nakashima at Fig. 1



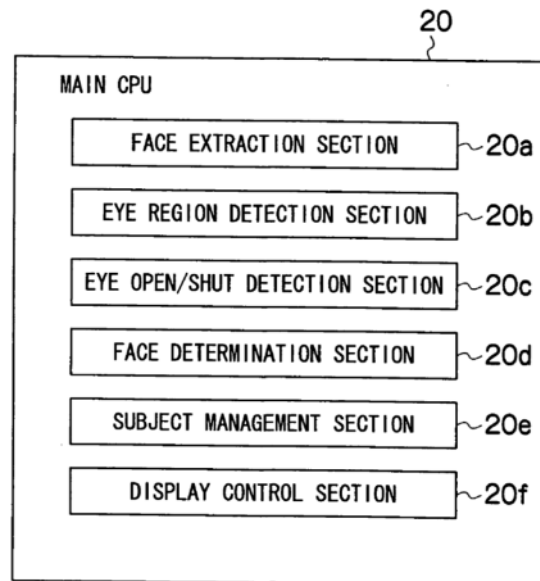
Nakashima at Fig. 2



Nakashima at Fig. 3



Nakashima at Fig. 4



Nakashima at Fig. 6

FIG.6

PHOTOGRAPHED IMAGE LIST TABLE

IMAGE FILE NAME	SUBJECT ID	MAIN SUBJECT ID	FACE SIZE	EYES	INAPPROPRIATE	EYES	INAPPROPRIATE
DIS00001.jpg	1, 2, 4, 5, 6	1	4	---	---	---	---
DIS00002.jpg	1, 2, 3, 6, 7, 8	2	5	---	---	---	---
...	...	...	...	...	---	---	---

~75b

Nakashima at Fig. 7

FIG.7

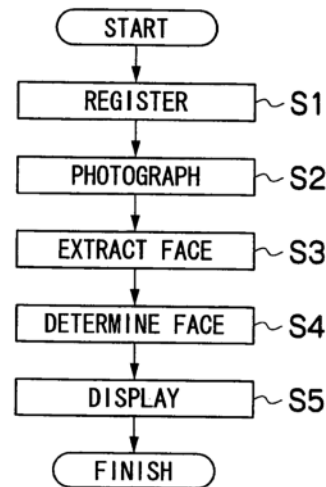
PHOTOGRAPH QUANTITY BY SUBJECT LIST TABLE

SUBJECT ID	NAME	PHOTOGRAPH TARGET	PHOTOGRAPH QUANTITY	MAIN SHOT QUANTITY
1	TARO FUJI	ON	5	2
2	HANAKO TAKAHASHI	ON	3	1
3	JIRO SUZUKI	OFF	0	0
4	KAZUKO KATO	ON	0	0
5	SAKURO TANABATO	ON	1	0
...	...	...	...	...

~75c

Nakashima at Fig. 9

FIG.9



Nakashima at [0004]

Conventionally, techniques have existed which allow a user to know who is captured in a photographed image. For instance, a digital camera disclosed in Japanese Patent Application Laid-Open 2004-62868 comprises: a photosensor configured to capture images; an access device for accessing a face database used for storing names and face identification information related to individuals; a processor configured to evaluate loaded images to locate faces, and match the located faces to face identification information stored in the face database; and a communication device for communicating with a user, configured to request the name of a person when the face in an image does not match the face stored in the face database at the present moment.

Nakashima at [0007]

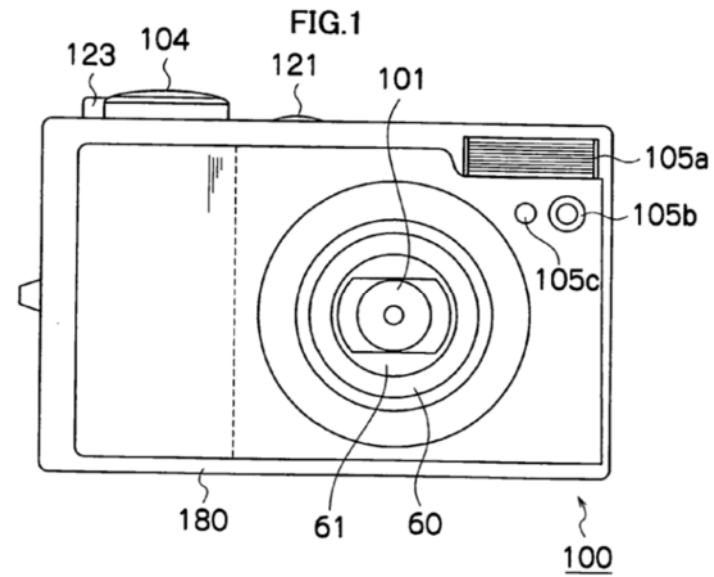
In order to solve the above problem, an image capturing apparatus according to the present invention comprises: an image capturing element which receives subject light incident via a photographing lens, converts the subject light into a captured image signal, and outputs the signal; an A/D conversion section which converts the captured image signal outputted by the image capturing element into image data and outputs the image data; a storage section which stores at least the image data outputted by the A/D conversion section; a registration section which relates identification facial images which are image data

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	to be used as criteria for identifying faces of subjects among the image data stored in the storage section to identification information of each object, and registers related data into a database; a facial image extraction section which extracts facial images which are facial portion regions of a person from photographed images which are desired image data outputted by the A/D conversion section and stored in the storage section; an identification section which identifies from the database an identification facial image matching an extracted facial image which is a facial image extracted by the facial image extraction section; and a photograph quantity calculation section which calculates for each subject identification information a photograph quantity which is the total number of photographed images from which an extracted facial image matching an identification facial image corresponding to identification information for each subject has been extracted. Nakashima at [0072] FIG. 1 is a front view of a digital camera (hereinafter abbreviated as “camera”) 100 according to a preferred embodiment of the present invention. Nakashima at [0079] An image displaying LCD 102, a switching lever 122, a cross-shaped key 124, an information position specifying key 126 and the like are also provided on the rear face of the camera 100. The cross-shaped key 124 is an operation system in which up, down, left and right respectively set display brightness adjustment/self-timer/macro photography/flash photography. Although a description will be provided later, pressing the down key of the cross-shaped key 124 enables setting of a self photographing mode, where a main CPU 20 causes a CCD 132 to perform shutter operations after conclusion of a clocking operation by a self-timer circuit 83. Nakashima at [0082]–[0083] The camera 100 is equipped with the release switch 104. Instructions to commence photographing are conveyed to the main CPU 20 by the release switch 104. In the camera 100, the switching lever 122 enables switching among photographing, playback, and the after-mentioned “list mode” to be performed arbitrarily. When photographing, the switching lever 122 is switched to its photographing side by the user. For playback, the switching lever 122 is switched to its playback side. For “list mode”, the switching lever 122 is switched to its “list” side. In addition, the camera 100 is equipped with a flash activating device comprising a flash activation tube 105a which activates flashes. The camera 100 also comprises the photographing lens 101, a diaphragm 131, and the CCD sensor 132 (hereinafter abbreviated to “CCD 132”) which is an image capturing element that converts subject images formed via the photographing lens 101 and the diaphragm 131 into analog image signals. More

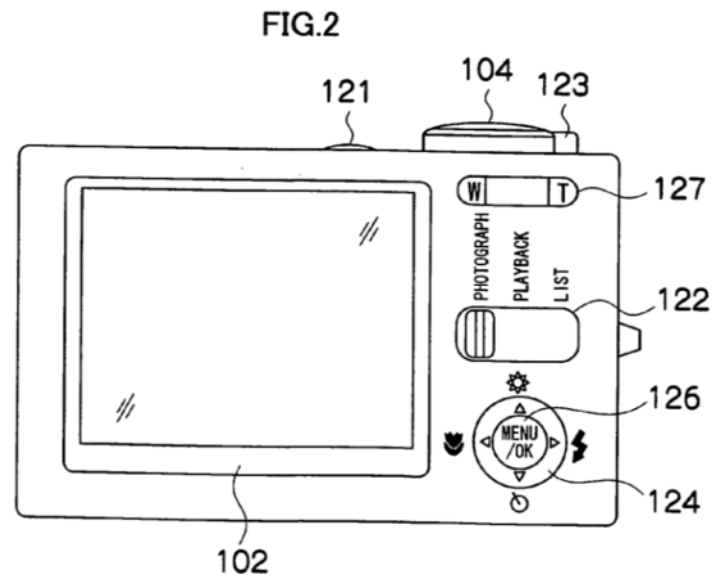
'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	specifically, the CCD 132 creates image signals by accumulating electric charges generated by subject light irradiating the CCD 132 over a variable electric charge accumulation period (exposure period). An image signal for each frame is sequentially outputted from the CCD 132 at timings synchronized with vertical synchronizing signals VD outputted from a CG section 136. Nakashima at [0086]–[0087] The camera 100 further comprises an A/D conversion section 134 which performs A/D conversion on the analog signals from the white-balance/gamma processing section 133 to convert into digital RGB image data, and a buffer memory 135 for storing the RGB data from the A/D conversion section 134. In the present embodiment, the A/D conversion section 134 has a quantization resolution of 8 bits, and converts analog RGB captured image signals outputted from the white-balance/gamma processing section 133 into RGB digital image data with levels of 0 to 255 and outputs the converted data. However, the described quantization resolution is merely an example, and is not a value essential to the present invention. Nakashima at [0115] FIG. 4 is a diagram conceptually illustrating a program executed by the main CPU 20. The main CPU 20 reads out: a face extraction section 20a; an eye region detection section 20b; an eye open/shut detection section 20c; a face determination section 20d; an object management setting section 20e; and a display control section 20f; which are programs stored in a computer readable storage media such as the EEPROM 146 or the hard disk 75, to a volatile memory (RAM or the like) and executes the programs. These programs may also be referred to as simply “program”. Nakashima at [0145] First, in step S1, a photographer who intends to photograph one or a plurality of subjects specified in advance sets the switching lever 122 to “photograph”, and individually photographs the face of each subject. For this purpose, it is preferable that the faces are photographed at clear and appropriate sizes to allow detection of the facial regions by the face detection section 20a. Each photographed facial image is displayed on the liquid crystal panel 71. The subject management section 20e accepts input of “names” of subjects through the graphical user interface (GUI), not shown, displayed on the liquid crystal panel 71. To the extent Maxell contends Nakashima does not disclose this limitation, a person of ordinary skill in the art would have readily arrived at this limitation by combining or modifying it in view of their general

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	knowledge and/or the prior art references disclosed in the corresponding section of Samsung's Invalidity Contentions.
[8d] record the image information in a recording medium;	Nakashima discloses "record the image information in a recording medium." For example: Nakashima at Abstract An image capturing apparatus comprising: an image capturing element which receives subject light incident via a photographing lens, converts the subject light into a captured image signal, and outputs the signal; an A/D conversion section which converts the captured image signal outputted by the image capturing element into image data and outputs the image data; a storage section which stores at least the image data outputted by the A/D conversion section; a registration section which relates identification facial images which are image data to be used as criteria for identifying faces of subjects among the image data stored in the storage section to identification information of each subject, and registers related data into a database; a facial image extraction section which extracts facial images which are facial portion regions of a person from photographed images which are desired image data outputted by the A/D conversion section and stored in the storage section; an identification section which identifies from the database an identification facial image matching an extracted facial image which is a facial image extracted by the facial image extraction section; and a photograph quantity calculation section which calculates for each subject identification information a photograph quantity which is the total number of photographed images from which an extracted facial image matching an identification facial image corresponding to identification information for each subject has been extracted.

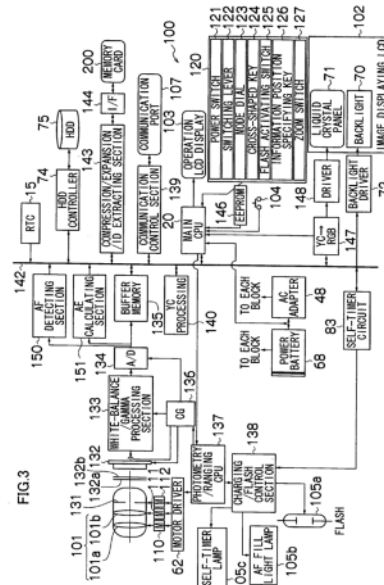
Nakashima at Fig. 1



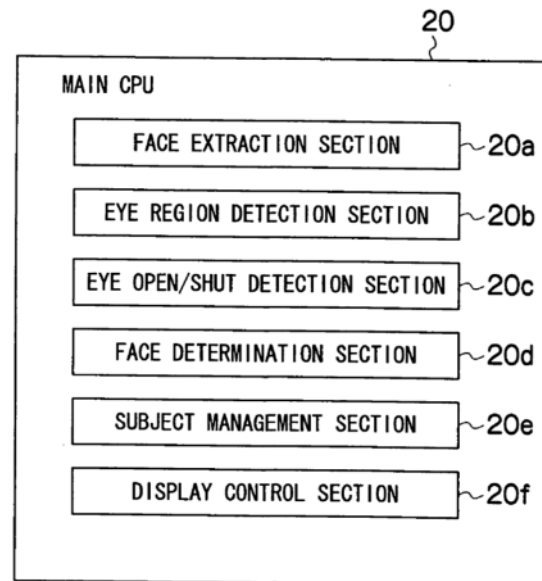
Nakashima at Fig. 2



Nakashima at Fig. 3



Nakashima at Fig. 4



Nakashima at Fig. 6

FIG.6

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IMAGE FILE NAME	SUBJECT ID	MAIN SUBJECT ID	FACE SIZE (HALF-OPEN)	INAPPROPRIATE SUBJECT ID	EYES INAPPROPRIATE SUBJECT ID	EYES INAPPROPRIATE SUBJECT ID
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DIS00002.jpg	1, 2, 3, 6, 7, 8	2	5	...	...	6
...	...	...	...	...	...	...

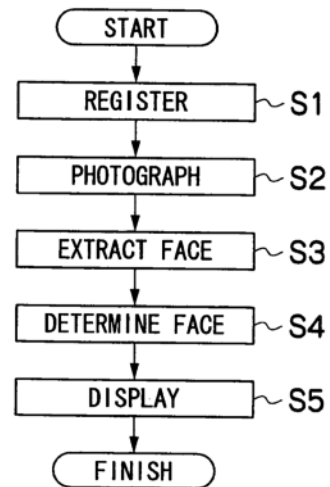
Nakashima at Fig. 7

FIG.7

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3	JIRO SUZUKI	OFF	0	0
4	KAZUKO KATO	ON	0	0
5	SAIBURO TANABATO	ON	1	0
...	...	...	...	...

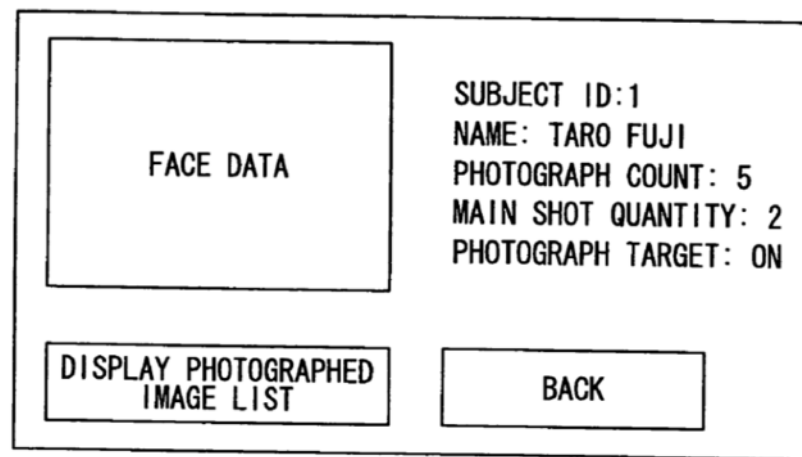
Nakashima at Fig. 9

FIG.9



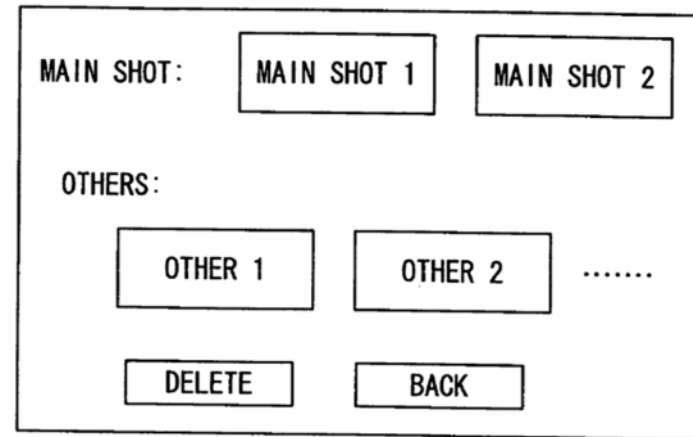
Nakashima at Fig. 12

FIG.12



Nakashima at Fig. 13

FIG.13



Nakashima at [0004]

Conventionally, techniques have existed which allow a user to know who is captured in a photographed image. For instance, a digital camera disclosed in Japanese Patent Application Laid-Open 2004-62868 comprises: a photosensor configured to capture images; an access device for accessing a face database used for storing names and face identification information related to individuals; a processor configured to evaluate loaded images to locate faces, and match the located faces to face identification information stored in the face database; and a communication device for communicating with a user, configured to request the name of a person when the face in an image does not match the face stored in the face database at the present moment.

Nakashima at [0007]

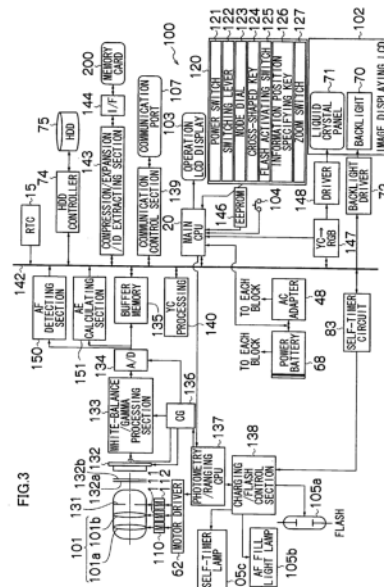
In order to solve the above problem, an image capturing apparatus according to the present invention comprises: an image capturing element which receives subject light incident via a photographing lens, converts the subject light into a captured image signal, and outputs the signal; an A/D conversion section which converts the captured image signal outputted by the image capturing element into image data and outputs the image data; a storage section which stores at least the image data outputted by the A/D conversion section; a registration section which relates identification facial images which are image data

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	to be used as criteria for identifying faces of subjects among the image data stored in the storage section to identification information of each object, and registers related data into a database; a facial image extraction section which extracts facial images which are facial portion regions of a person from photographed images which are desired image data outputted by the A/D conversion section and stored in the storage section; an identification section which identifies from the database an identification facial image matching an extracted facial image which is a facial image extracted by the facial image extraction section; and a photograph quantity calculation section which calculates for each subject identification information a photograph quantity which is the total number of photographed images from which an extracted facial image matching an identification facial image corresponding to identification information for each subject has been extracted. Nakashima at [0082]–[0083] The camera 100 is equipped with the release switch 104. Instructions to commence photographing are conveyed to the main CPU 20 by the release switch 104. In the camera 100, the switching lever 122 enables switching among photographing, playback, and the after-mentioned “list mode” to be performed arbitrarily. When photographing, the switching lever 122 is switched to its photographing side by the user. For playback, the switching lever 122 is switched to its playback side. For “list mode”, the switching lever 122 is switched to its “list” side. In addition, the camera 100 is equipped with a flash activating device comprising a flash activation tube 105a which activates flashes. The camera 100 also comprises the photographing lens 101, a diaphragm 131, and the CCD sensor 132 (hereinafter abbreviated to “CCD 132”) which is an image capturing element that converts subject images formed via the photographing lens 101 and the diaphragm 131 into analog image signals. More specifically, the CCD 132 creates image signals by accumulating electric charges generated by subject light irradiating the CCD 132 over a variable electric charge accumulation period (exposure period). An image signal for each frame is sequentially outputted from the CCD 132 at timings synchronized with vertical synchronizing signals VD outputted from a CG section 136. Nakashima at [0086]–[0087] The camera 100 further comprises an A/D conversion section 134 which performs A/D conversion on the analog signals from the white-balance/gamma processing section 133 to convert into digital RGB image data, and a buffer memory 135 for storing the RGB data from the A/D conversion section 134. In the present embodiment, the A/D conversion section 134 has a quantization resolution of 8 bits, and converts analog RGB captured image signals outputted from the white-balance/gamma processing section 133 into RGB digital image data with levels of 0 to 255 and outputs the converted data. However,

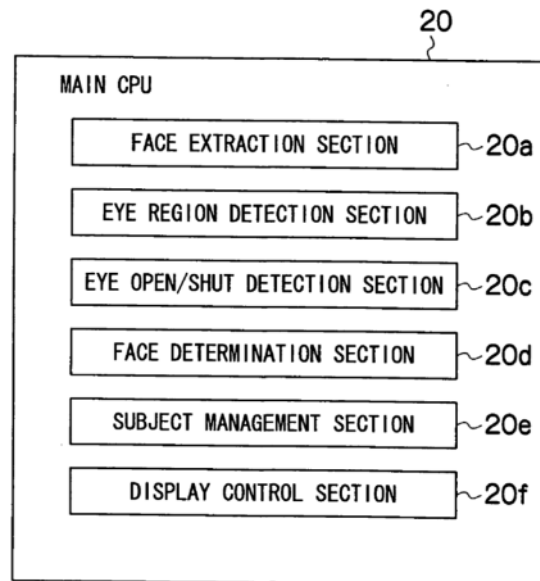
'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	the described quantization resolution is merely an example, and is not a value essential to the present invention. Nakashima at [0106] The camera 100 is also provided with a compression/expansion/ID extracting section 143 and an I/F section 144. The compression/expansion/ID extracting section 143 reads out image data stored in the buffer memory 135 via a bus line 142 and compresses the image data, and stores the image data into a memory card 200 via the I/F section 144. In addition, when reading out image data stored in the memory card 200, the compression/expansion/ID extracting section 143 extracts an identification number (ID) unique to the memory card 200, reads out image data stored in the memory card 200 and expands the image data, and stores the image data into the buffer memory 135. Nakashima at [0107] Y/C signals stored in the buffer memory 135 are compressed by the compression/expansion/ID extracting section 143 into a predetermined format, and are then recorded to a removable media such as the memory card 200 or a built-in high-capacity storage media such as a hard disk (HDD) 75 via the I/F section 144 in a predetermined format (e.g. Exif (Exchangeable Image File Format) file). Recording of data to the hard disk (HDD) 75 or reading of data from the hard disk (HDD) 75 is controlled by a hard disk controller 74 in response to instructions from the main CPU 20. Nakashima at [0115] FIG. 4 is a diagram conceptually illustrating a program executed by the main CPU 20. The main CPU 20 reads out: a face extraction section 20a; an eye region detection section 20b; an eye open/shut detection section 20c; a face determination section 20d; an object management setting section 20e; and a display control section 20f; which are programs stored in a computer readable storage media such as the EEPROM 146 or the hard disk 75, to a volatile memory (RAM or the like) and executes the programs. These programs may also be referred to as simply “program”. Nakashima at [0145] First, in step S1, a photographer who intends to photograph one or a plurality of subjects specified in advance sets the switching lever 122 to “photograph”, and individually photographs the face of each subject. For this purpose, it is preferable that the faces are photographed at clear and appropriate sizes to allow detection of the facial regions by the face detection section 20a. Each photographed facial image is displayed on the liquid crystal panel 71. The subject management section 20e accepts input of “names”

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	of subjects through the graphical user interface (GUI), not shown, displayed on the liquid crystal panel 71. To the extent Maxell contends Nakashima does not disclose this limitation, a person of ordinary skill in the art would have readily arrived at this limitation by combining or modifying it in view of their general knowledge and/or the prior art references disclosed in the corresponding section of Samsung's Invalidity Contentions.
[8e] execute a face-recognizing process on the image information to recognize a face;	Nakashima discloses "execute a face-recognizing process on the image information to recognize a face." For example: Nakashima at Abstract An image capturing apparatus comprising: an image capturing element which receives subject light incident via a photographing lens, converts the subject light into a captured image signal, and outputs the signal; an A/D conversion section which converts the captured image signal outputted by the image capturing element into image data and outputs the image data; a storage section which stores at least the image data outputted by the A/D conversion section; a registration section which relates identification facial images which are image data to be used as criteria for identifying faces of subjects among the image data stored in the storage section to identification information of each subject, and registers related data into a database; a facial image extraction section which extracts facial images which are facial portion regions of a person from photographed images which are desired image data outputted by the A/D conversion section and stored in the storage section; an identification section which identifies from the database an identification facial image matching an extracted facial image which is a facial image extracted by the facial image extraction section; and a photograph quantity calculation section which calculates for each subject identification information a photograph quantity which is the total number of photographed images from which an extracted facial image matching an identification facial image corresponding to identification information for each subject has been extracted.

Nakashima at Fig. 3



Nakashima at Fig. 4



Nakashima at Fig. 6

FIG.6

PHOTOGRAPHED IMAGE LIST TABLE						
IMAGE FILE NAME	SUBJECT ID	MAIN SUBJECT ID	FACE SIZE ID / INAPPROPRIATE SUBJECT ID	EYES (HALF-OPEN) SUBJECT ID	EYES INAPPROPRIATE SUBJECT ID	~75b
DS00001.jpg	1, 2, 4, 5, 6	1	4	-	6	
DS00002.jpg	1, 2, 3, 6, 7, 8	2	5	7	6	
...	...	...	...	...	...	...

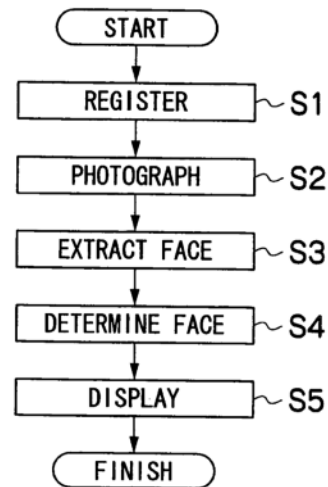
Nakashima at Fig. 7

FIG.7

PHOTOGRAPH QUANTITY BY SUBJECT LIST TABLE				
SUBJECT ID	NAME	PHOTOGRAPH TARGET	PHOTOGRAPH QUANTITY	MAIN SHOT QUANTITY
1	TARO FUJI	ON	5	2
2	HANAKO TAKAHASHI	ON	3	1
3	JIRO SUZUKI	OFF	0	0
4	KAZUKO KATO	ON	0	0
5	SAKURO TANABATO	ON	1	0
...	...	...	...	...

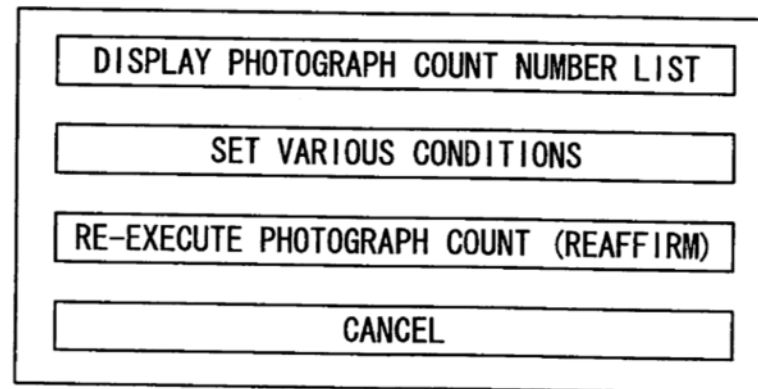
Nakashima at Fig. 9

FIG.9



Nakashima at Fig. 10

FIG.10



Nakashima at Fig. 11

FIG.11

ID	NAME	TARGET	PHOTOGRAPH QUANTITY	MAIN QUANTITY
4	KAZUKO KATO	ON	0	0
5	SABURO YAMAMOTO	ON	1	0
2	HANAKO TAKAHASHI	ON	3	1
1	TARO FUJI	ON	5	2
3	JIRO SUZUKI	OFF	0	0

DISPLAY DETAILS

BACK

Nakashima at Fig. 12

FIG.12

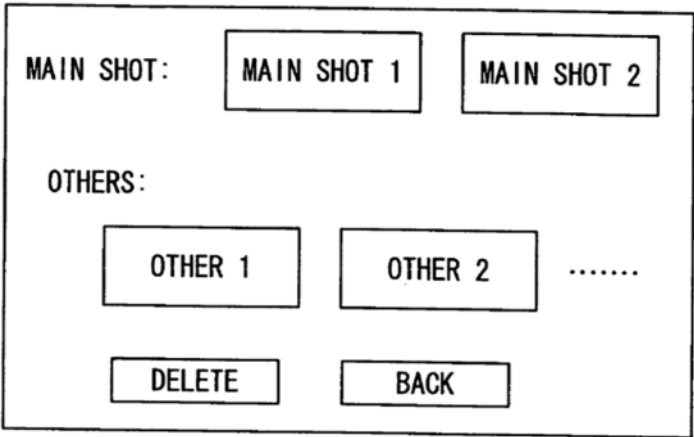
FACE DATA

SUBJECT ID:1
NAME: TARO FUJI
PHOTOGRAPH COUNT: 5
MAIN SHOT QUANTITY: 2
PHOTOGRAPH TARGET: ON

DISPLAY PHOTOGRAPHED
IMAGE LIST

BACK

Nakashima at Fig. 13

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	FIG.13  Nakashima at [0004] Conventionally, techniques have existed which allow a user to know who is captured in a photographed image. For instance, a digital camera disclosed in Japanese Patent Application Laid-Open 2004-62868 comprises: a photosensor configured to capture images; an access device for accessing a face database used for storing names and face identification information related to individuals; a processor configured to evaluate loaded images to locate faces, and match the located faces to face identification information stored in the face database; and a communication device for communicating with a user, configured to request the name of a person when the face in an image does not match the face stored in the face database at the present moment. Nakashima at [0005]–[0006] With events such as school events, there is a need to be able to photograph each and every person to be photographed as subjects, such as students or children, in a uniform manner, or so that a certain photograph quantity will be taken for each subject. In this regard, the technique disclosed in Japanese Patent Application Laid-Open No. 2004-62868 merely requires that names are attached to faces which are detected a predefined number of times or more, and therefore is not useful towards equalizing the number of photographs taken.

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	The present invention has been made in consideration of the above problem, and its object is to prevent, as much as possible, bias among the number of photographs taken for subjects by managing the number of photographs taken for each subject. Nakashima at [0007] In order to solve the above problem, an image capturing apparatus according to the present invention comprises: an image capturing element which receives subject light incident via a photographing lens, converts the subject light into a captured image signal, and outputs the signal; an A/D conversion section which converts the captured image signal outputted by the image capturing element into image data and outputs the image data; a storage section which stores at least the image data outputted by the A/D conversion section; a registration section which relates identification facial images which are image data to be used as criteria for identifying faces of subjects among the image data stored in the storage section to identification information of each object, and registers related data into a database; a facial image extraction section which extracts facial images which are facial portion regions of a person from photographed images which are desired image data outputted by the A/D conversion section and stored in the storage section; an identification section which identifies from the database an identification facial image matching an extracted facial image which is a facial image extracted by the facial image extraction section; and a photograph quantity calculation section which calculates for each subject identification information a photograph quantity which is the total number of photographed images from which an extracted facial image matching an identification facial image corresponding to identification information for each subject has been extracted. Nakashima at [0008]–[0010] In the image capturing apparatus according to the present invention, by registering in advance a facial image of each individual intended to be a subject, the number of photographed images from which facial images matching each facial image have been extracted is calculated. Displaying this photograph quantity with a LCD and the like, or notifying the photograph quantity through audio or the like, a user may easily learn how many photographs have been taken for which subject. Therefore, it becomes possible to prevent, as much as possible, occurrences of biases among the photograph quantities of subjects, such as cases where a desired photograph quantity is not taken for certain subjects or no photographs are taken for certain subjects. A photograph quantity corresponding to the identification information of each subject is preferably displayed at a predefined timing. “Predefined timing” means before or after start of photographing, or more specifically, upon half-pressing or full-pressing a release switch, upon setting or deactivating

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	settings of photographing modes, or upon transition to a predefined mode for confirming a photograph quantity. The image capturing apparatus may further comprise a main subject determination section which determines which subject is a main subject based on photographed images and extracted facial images extracted from the photographed images. Nakashima at [0115] FIG. 4 is a diagram conceptually illustrating a program executed by the main CPU 20. The main CPU 20 reads out: a face extraction section 20a; an eye region detection section 20b; an eye open/shut detection section 20c; a face determination section 20d; an object management setting section 20e; and a display control section 20f; which are programs stored in a computer readable storage media such as the EEPROM 146 or the hard disk 75, to a volatile memory (RAM or the like) and executes the programs. These programs may also be referred to as simply “program”. Nakashima at [0116]–[0118] The face extraction section 20a extracts facial regions, which are regions that include facial portions of individuals, from images stored in the HDD 75 or images that are sequentially stored in the buffer memory 135 (these images may be hereinafter referred to as “original images”). As for the method for extracting facial regions, for instance, a technique disclosed in Japanese Patent Application Laid-Open No. 09-101579 “Facial Region Extraction Method and Copying Condition Determination Method” by the present inventor may be applied. This technique determines whether the hue of each pixel of a photographed image falls in a skin color range in order to divide the image into a skin-colored region and a non-skin-colored region, and detects edges in the image in order to classify each location in the image to either edge portions or non-edge portions. A region within a skin-colored region comprising pixels classified as non-edge portions and surrounded by pixels determined to be edge portions is extracted as a face candidate region. The extracted face candidate region is determined whether it corresponds to a face of a person, and is then extracted as a facial region based on the determination results. Alternatively, facial regions may be extracted using methods described in Japanese Patent Application Laid-Open No. 2003-209683 or Japanese Patent Application Laid-Open No. 2002-199221. In the following description, images of facial regions extracted from original images by the face extraction portion 20a will be referred to as “extracted facial images”.

Nakashima at [0121]

The face determination section 20d identifies a registration facial image matching an extracted facial image extracted by the face extraction section 20a from a basic information registration table 75a in the HDD 75, herein after-mentioned, and identifies the subject ID corresponding to the identified registration facial image. Various facial recognition techniques may be used to determine matches between registration facial images and extracted facial images. For instance, matches may be determined based on face sizes, face contours, eye positions or the like.

Nakashima at [0124]–[0130]

Referring now to FIG. 6, a photographed image list table 75b is stored in the hard disk 75. In this table, photographed images which are images obtained by fully pressing the release switch 104; subject IDs identified from the images by the face determination section 20d (in other words, identification information of the subjects shown in the image); main subject IDs which are the subject IDs of main subjects in the images; “face size inappropriate subject IDs” which are subject ID for subjects photographed at a size inappropriate for viewing or printing; “eyes inappropriate (half-open) subject IDs” which are subject IDs for subjects with eyes shut or half-open; and “line of sight inappropriate subject IDs” which are subject IDs for subjects whose lines of sight are inappropriate, are related to each other and stored.

Determination of which subject's subject ID should be stored in the photographed image list table as a “main subject ID”, a “face size inappropriate subject ID”, an “eyes inappropriate (half-open) subject ID” or a “line of sight inappropriate subject ID” may be either performed through software processing executed by the CPU 20, or through arbitrary operation of the operation section 120 by the user.

For instance, the face determination section 20 determines whether an extracted facial image detected by the face extraction section 20a is under a predefined size (for example, an absolute threshold such as 100 by 100 pixels, or a relative threshold such as the area ratio of the extracted image to the original image) (face size determination). If the extracted facial image is under the predefined size, a subject ID corresponding to a registered facial image matching a facial image of the facial region is related to the image as a “face size inappropriate subject ID”, and stored in the photographed image list table 75b.

Alternatively, the face determination section 20 stores a subject ID corresponding to a registered facial image matching a facial region in which the eyes are determined by the eyes open/shut detection section 20c to be shut and/or half-open as an eyes inappropriate (half-open) subject ID into the photographed image list table 75b.

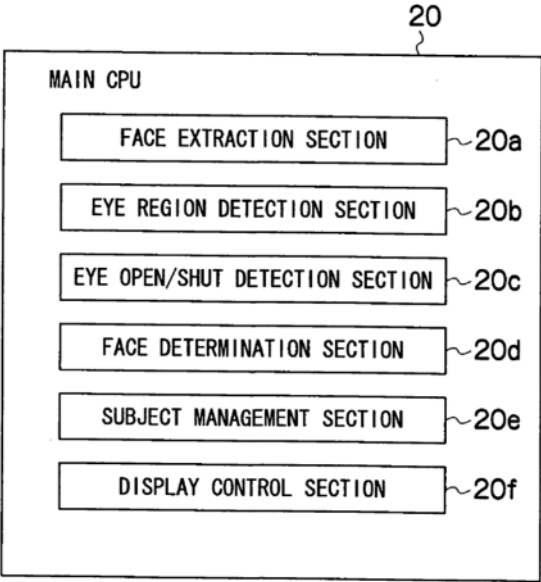
In addition, the face determination section 20 displays a list of extracted facial images detected by the face extraction section 20a onto the image display LCD 102 to have the user select an extracted facial image where the line of sight is deviated, and stores a subject ID corresponding to a registered facial

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	image matching the selected extracted facial image as a line of sight inappropriate subject ID into the photographed image list table 75b. Alternatively, the face determination section 20 determines whether an extracted facial image is a main subject based on whether the extracted facial image was at a predefined position, such as the focus position of the AF detection section 150 or the vicinity of the center of the original image upon half-pressing of the release switch 104 (main subject determination). However, if there is only one extracted facial image, the extracted facial image is determined to be the main subject regardless of whether it is positioned at a predefined position. When an extracted facial image is determined to be the main subject, a subject ID corresponding to a registered facial image matching the extracted facial image is stored in the photographed image list table 75b as a main subject ID. While the above-described face extraction section 20a, eye region detection section 20b, eye open/shut detection section 20c, face determination section 20d, subject management section 20e, and the display control section 20f are programs executed by the main CPU 20, a variation configured so that either a portion of or all of the above programs are implemented in a dedicated semiconductor integrated circuit (ASIC or Application Specific Integrated Circuit) is also possible. This variation is preferable, since it reduces the load on the main CPU 20. Nakashima at [0131]–[0133] Referring now to FIG. 7, a photograph quantity by subject list table 75c is stored in the hard disk 75. Among the images stored in the HDD 75, to all original images or desired original images specified via the operation section 120, the photograph quantity by subject list table 75c relates: “photograph quantities” which indicate the total number of original images containing an extracted facial image matching a registered facial image; “photograph targets” which are flags indicating whether an original image will be a target of face extraction by the face extraction section 20a; “main shot quantities” which are the total number of original images in which the extracted facial image is the main subject; and “subject IDs” and “names” corresponding to registered facial images matching the extracted facial images. Counting of the photograph quantity for each subject is performed by the subject management section 20e by individually adding up the number of extracted facial images, among those extracted from the original image by the face extraction section 20a, which match a certain registered facial image for each registered image. In addition, counting of the main shot quantity for each subject is performed by the subject management section 20e by individually adding up the number of extracted facial images positioned at the focus position of the AF detection section 150 or the vicinity of the center of the original image during photography for each registered image matching the extracted facial images.

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	While a description will be provided later, the subject management section 20e may also be arranged to exclude original images which include extracted facial images corresponding to subject IDs stored as “face size inappropriate subject IDs”, “eyes inappropriate (half-open) subject IDs” or “line of sight inappropriate subject IDs” from the aggregate total of the photograph quantities. Nakashima at [0145] First, in step S1, a photographer who intends to photograph one or a plurality of subjects specified in advance sets the switching lever 122 to “photograph”, and individually photographs the face of each subject. For this purpose, it is preferable that the faces are photographed at clear and appropriate sizes to allow detection of the facial regions by the face detection section 20a. Each photographed facial image is displayed on the liquid crystal panel 71. The subject management section 20e accepts input of “names” of subjects through the graphical user interface (GUI), not shown, displayed on the liquid crystal panel 71. To the extent Maxell contends Nakashima does not disclose this limitation, a person of ordinary skill in the art would have readily arrived at this limitation by combining or modifying it in view of their general knowledge and/or the prior art references disclosed in the corresponding section of Samsung’s Invalidity Contentions.
[8f] reproduce the recorded image from the recording medium;	Nakashima discloses “reproduce the recorded image from the recording medium.” For example: Nakashima at Abstract An image capturing apparatus comprising: an image capturing element which receives subject light incident via a photographing lens, converts the subject light into a captured image signal, and outputs the signal; an A/D conversion section which converts the captured image signal outputted by the image capturing element into image data and outputs the image data; a storage section which stores at least the image data outputted by the A/D conversion section; a registration section which relates identification facial images which are image data to be used as criteria for identifying faces of subjects among the image data stored in the storage section to identification information of each subject, and registers related data into a database; a facial image extraction section which extracts facial images which are facial portion regions of a person from photographed images which are desired image data outputted by the A/D conversion section and stored in the storage section; an identification section which identifies from the database an identification facial image matching an extracted facial image which is a facial image extracted by the facial image extraction section; and a photograph quantity calculation section which calculates for each subject identification information a photograph quantity which is the total number of

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	photographed images from which an extracted facial image matching an identification facial image corresponding to identification information for each subject has been extracted. Nakashima at Fig. 3 FIG. 3

Nakashima at Fig. 4



Nakashima at Fig. 6

FIG. 6

PHOTOGRAPHED IMAGE LIST TABLE

IMAGE FILE NAME	SUBJECT ID	MAIN SUBJECT ID	FACE SIZE INAPPROPRIATE SUBJECT ID	EYES INAPPROPRIATE (HALF-OPEN) SUBJECT ID	EYES INAPPROPRIATE SUBJECT ID
DISC00001.JPG	1, 2, 4, 5, 6	1	4	-	6
DISC00002.JPG	1, 2, 3, 6, 7, 8	2	5	7	6
...	...	...	...	...	...

Nakashima at Fig. 7

FIG.7

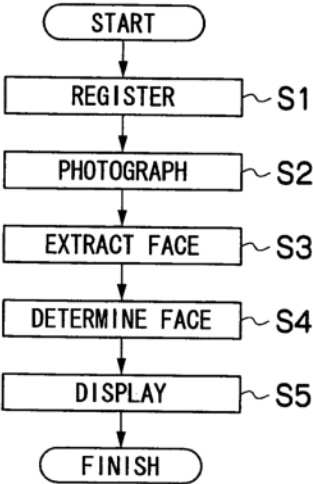
PHOTOGRAPH QUANTITY BY SUBJECT LIST TABLE

SUBJECT ID	NAME	PHOTOGRAPH TARGET	PHOTOGRAPH QUANTITY	MAIN SHOT QUANTITY
1	TARO FUJI	ON	5	2
2	HANAKO TAKAHASHI	ON	3	1
3	JIRO SUZUKI	OFF	0	0
4	KAZUO KATO	ON	0	0
5	SAEKO YAMAMOTO	ON	1	0
...	...	...	...	...

75c

Nakashima at Fig. 9

FIG.9



Nakashima at Fig. 10

FIG.10

FIG.10 is a menu screen with a rectangular border. Inside, there are four horizontal rectangular buttons stacked vertically. The top button contains the text "DISPLAY PHOTOGRAPH COUNT NUMBER LIST". The second button contains "SET VARIOUS CONDITIONS". The third button contains "RE-EXECUTE PHOTOGRAPH COUNT (REAFFIRM)". The bottom button contains "CANCEL".

Nakashima at Fig. 11

FIG.11

FIG.11 is a screen displaying a table with 5 columns: ID, NAME, TARGET, PHOTOGRAPH QUANTITY, and MAIN QUANTITY. The table contains 5 rows of data. Below the table are two buttons: "DISPLAY DETAILS" and "BACK".

ID	NAME	TARGET	PHOTOGRAPH QUANTITY	MAIN QUANTITY
4	KAZUKO KATO	ON	0	0
5	SABURO YAMAMOTO	ON	1	0
2	HANAKO TAKAHASHI	ON	3	1
1	TARO FUJI	ON	5	2
3	JIRO SUZUKI	OFF	0	0

Nakashima at Fig. 12

FIG.12

FACE DATA	SUBJECT ID:1 NAME: TARO FUJI PHOTOGRAPH COUNT: 5 MAIN SHOT QUANTITY: 2 PHOTOGRAPH TARGET: ON	
	<table border="0"><tr><td>DISPLAY PHOTOGRAPHED IMAGE LIST</td><td>BACK</td></tr></table>	DISPLAY PHOTOGRAPHED IMAGE LIST
DISPLAY PHOTOGRAPHED IMAGE LIST	BACK	

Nakashima at Fig. 13

FIG.13

MAIN SHOT:	MAIN SHOT 1	MAIN SHOT 2
OTHERS:		
OTHER 1	OTHER 2	
DELETE	BACK	

Nakashima at [0005]–[0006]

With events such as school events, there is a need to be able to photograph each and every person to be photographed as subjects, such as students or children, in a uniform manner, or so that a certain photograph quantity will be taken for each subject. In this regard, the technique disclosed in Japanese Patent Application Laid-Open No. 2004-62868 merely requires that names are attached to faces which are detected a predefined number of times or more, and therefore is not useful towards equalizing the number of photographs taken.

The present invention has been made in consideration of the above problem, and its object is to prevent, as much as possible, bias among the number of photographs taken for subjects by managing the number of photographs taken for each subject.

Nakashima at [0007]

In order to solve the above problem, an image capturing apparatus according to the present invention comprises: an image capturing element which receives subject light incident via a photographing lens, converts the subject light into a captured image signal, and outputs the signal; an A/D conversion section which converts the captured image signal outputted by the image capturing element into image data and outputs the image data; a storage section which stores at least the image data outputted by the A/D conversion section; a registration section which relates identification facial images which are image data to be used as criteria for identifying faces of subjects among the image data stored in the storage section to identification information of each object, and registers related data into a database; a facial image extraction section which extracts facial images which are facial portion regions of a person from photographed images which are desired image data outputted by the A/D conversion section and stored in the storage section; an identification section which identifies from the database an identification facial image matching an extracted facial image which is a facial image extracted by the facial image extraction section; and a photograph quantity calculation section which calculates for each subject identification information a photograph quantity which is the total number of photographed images from which an extracted facial image matching an identification facial image corresponding to identification information for each subject has been extracted.

Nakashima at [0011]–[0012]

Moreover, the photograph quantity calculation section may be arranged to calculate a main subject photograph quantity which is the total number of photographed images in which extracted facial images of a subject determined to be the main subject by the main subject determination section are extracted, while the display section may display the main subject photograph quantity at a predefined timing.

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	In other words, by limiting the displayed number of photographed images to only those for the main subject, the number of photographed images featuring the main subject can be learned in a convenient manner. Nakashima at [0081] The camera 100 also comprises: the image displaying LCD 102 for displaying photographed images, playback images or the like; and an operation LCD display 103 which provides assistance for operation. Nakashima at [0115] FIG. 4 is a diagram conceptually illustrating a program executed by the main CPU 20. The main CPU 20 reads out: a face extraction section 20a; an eye region detection section 20b; an eye open/shut detection section 20c; a face determination section 20d; an object management setting section 20e; and a display control section 20f; which are programs stored in a computer readable storage media such as the EEPROM 146 or the hard disk 75, to a volatile memory (RAM or the like) and executes the programs. These programs may also be referred to as simply “program”. Nakashima at [0124]–[0130] Referring now to FIG. 6, a photographed image list table 75b is stored in the hard disk 75. In this table, photographed images which are images obtained by fully pressing the release switch 104; subject IDs identified from the images by the face determination section 20d (in other words, identification information of the subjects shown in the image); main subject IDs which are the subject IDs of main subjects in the images; “face size inappropriate subject IDs” which are subject ID for subjects photographed at a size inappropriate for viewing or printing; “eyes inappropriate (half-open) subject IDs” which are subject IDs for subjects with eyes shut or half-open; and “line of sight inappropriate subject IDs” which are subject IDs for subjects whose lines of sight are inappropriate, are related to each other and stored. Determination of which subject's subject ID should be stored in the photographed image list table as a “main subject ID”, a “face size inappropriate subject ID”, an “eyes inappropriate (half-open) subject ID” or a “line of sight inappropriate subject ID” may be either performed through software processing executed by the CPU 20, or through arbitrary operation of the operation section 120 by the user. For instance, the face determination section 20 determines whether an extracted facial image detected by the face extraction section 20a is under a predefined size (for example, an absolute threshold such as 100 by 100 pixels, or a relative threshold such as the area ratio of the extracted image to the original image) (face size determination). If the extracted facial image is under the predefined size, a subject ID

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	corresponding to a registered facial image matching a facial image of the facial region is related to the image as a “face size inappropriate subject ID”, and stored in the photographed image list table 75b. Alternatively, the face determination section 20 stores a subject ID corresponding to a registered facial image matching a facial region in which the eyes are determined by the eyes open/shut detection section 20c to be shut and/or half-open as an eyes inappropriate (half-open) subject ID into the photographed image list table 75b. In addition, the face determination section 20 displays a list of extracted facial images detected by the face extraction section 20a onto the image display LCD 102 to have the user select an extracted facial image where the line of sight is deviated, and stores a subject ID corresponding to a registered facial image matching the selected extracted facial image as a line of sight inappropriate subject ID into the photographed image list table 75b. Alternatively, the face determination section 20 determines whether an extracted facial image is a main subject based on whether the extracted facial image was at a predefined position, such as the focus position of the AF detection section 150 or the vicinity of the center of the original image upon half-pressing of the release switch 104 (main subject determination). However, if there is only one extracted facial image, the extracted facial image is determined to be the main subject regardless of whether it is positioned at a predefined position. When an extracted facial image is determined to be the main subject, a subject ID corresponding to a registered facial image matching the extracted facial image is stored in the photographed image list table 75b as a main subject ID. While the above-described face extraction section 20a, eye region detection section 20b, eye open/shut detection section 20c, face determination section 20d, subject management section 20e, and the display control section 20f are programs executed by the main CPU 20, a variation configured so that either a portion of or all of the above programs are implemented in a dedicated semiconductor integrated circuit (ASIC or Application Specific Integrated Circuit) is also possible. This variation is preferable, since it reduces the load on the main CPU 20. Nakashima at [0131]–[0133] Referring now to FIG. 7, a photograph quantity by subject list table 75c is stored in the hard disk 75. Among the images stored in the HDD 75, to all original images or desired original images specified via the operation section 120, the photograph quantity by subject list table 75c relates: “photograph quantities” which indicate the total number of original images containing an extracted facial image matching a registered facial image; “photograph targets” which are flags indicating whether an original image will be a target of face extraction by the face extraction section 20a; “main shot quantities” which are the total number of original images in which the extracted facial image is the main subject; and

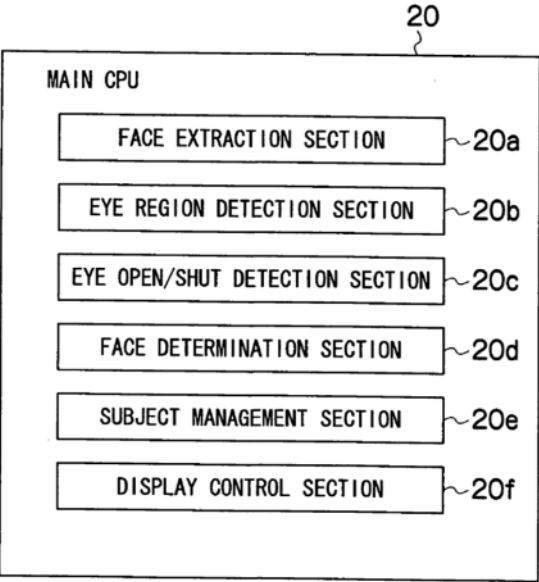
'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	“subject IDs” and “names” corresponding to registered facial images matching the extracted facial images. Counting of the photograph quantity for each subject is performed by the subject management section 20e by individually adding up the number of extracted facial images, among those extracted from the original image by the face extraction section 20a, which match a certain registered facial image for each registered image. In addition, counting of the main shot quantity for each subject is performed by the subject management section 20e by individually adding up the number of extracted facial images positioned at the focus position of the AF detection section 150 or the vicinity of the center of the original image during photography for each registered image matching the extracted facial images. While a description will be provided later, the subject management section 20e may also be arranged to exclude original images which include extracted facial images corresponding to subject IDs stored as “face size inappropriate subject IDs”, “eyes inappropriate (half-open) subject IDs” or “line of sight inappropriate subject IDs” from the aggregate total of the photograph quantities. Nakashima at [0136]–[0143] FIG. 8 shows a condition setting screen which is an example of the GUI. Items settable by the condition setting screen are: a “face size” which is a relative area ratio threshold used for face size determination of an extracted facial image to an original image; whether facial images with eyes half-open will be considered valid/invalid as extracted facial images; whether only extracted facial images with subjects looking straight into the camera will be calculated for photograph quantities and main shot quantities; whether only extracted facial images in which their subjects are main subjects will be calculated for main shot quantities; a “minimum photograph quantity” which is a prescribed photograph quantity; an original image range which the face extraction section 20a targets for extracting facial regions (in this example, “from (start)” and “to (end)” of time and date of photography; and an estimated time of finish of photography of a subject. The relationships between the setting items of the condition setting screen and the operation conditions of the programs are as follows. The face determination section 20d references an area ratio threshold set so as to correspond to a subject ID to determine whether the relative area ratio of a registered facial image corresponding to that subject ID to its original image exceeds the threshold. If not, the subject ID is stored as a “face size inappropriate subject ID”. Additionally, if “half-open invalid” is checked for a subject ID, in addition to an extracted facial image in which the eyes are completely shut, the eyes open/shut detection section 20c also stores an extracted facial image in which the eyes are neither completely shut nor completely open (so-called half-open) as an “eyes inappropriate (half-open) subject ID”.

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	Moreover, the subject management section 20e calculates an aggregate total of “main shot IDs” only when “main shot” is checked for a subject ID. If a “minimum photography quantity” of 1 or above is set for a subject ID, the subject management section 20e references the “photograph quantity” corresponding to that subject ID at a predefined timing (for instance, the time set as “estimated finish”, or after a lapse of a predefined time, such as 15 minutes, after setting to photography mode). If the “photograph quantity” is under the “minimum photography quantity”, a predefined warning is displayed on the liquid crystal 71. Alternatively, a warning message indicating the name of a subject for which the “photograph quantity” is under the “minimum photography quantity” may be played back through a speaker, not shown. This allows the photographer to easily acknowledge which subject's photograph quantity has not reached a prescribed quantity without having to go through the trouble of visually confirming the photograph quantity. Furthermore, if “from” and “to” have been set, the face extraction section 20a performs face extraction only on original images with image recording dates/times recorded in datetimeoriginal tags or the like which are within the range defined by “from” and “to”. This allows a photographer to arbitrarily specify at what timing images should be photographed to become targets of facial extraction, and is therefore preferable. These setting items are individually settable for each subject ID, and set items are only valid for registered facial images corresponding to each subject ID. Conditions set with this screen are related to subject IDs and stored in the EEPROM 146 or the like, and will become the conditions to which the main CPU 20 conforms when executing the various programs. Nakashima at [0151] On the other hand, the “photograph quantity” of the photograph quantity by subject list table 75c, which is the total number of photographed images for which subject IDs were identified by the facial determination section 20d, is updated for each subject ID. In other words, whenever photography is performed, the total number of each subject appearing in the images photographed thus far is stored into the photograph quantity by subject list table 75c. Nakashima at [0156]–[0158] FIG. 10 shows an example of a camera mode selection screen. In this camera mode selection screen, buttons for specifying four types of operations, namely “display photograph count list”, “set various conditions”, “re-execute photograph count” and “cancel”, are displayed. Each menu may be selected/specified using the cross-shape key 124 or the like in the operation section to execute operations corresponding to each selected mode.

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	“Re-execute photograph count” is a button used to give the re-execution instruction of step S4. The processing of step S4 is executed upon operation of this button. When “display photograph count list” is selected, the display control section 20f displays information stored in the photograph quantity by subject list table 75c on the liquid crystal panel 71. Nakashima at [0161] FIG. 12 shows a display example of individual information. For instance, in addition to specified list information (subject ID, name, photograph quantity, main shot quantity, photograph target flag), a registered facial image is displayed on this screen. A photographer may reference this screen and confirm which subject has had fewer or more photographs taken than others while looking at the faces or names of the subjects. Nakashima at [0165]–[0167] FIG. 13 shows a list display example of photographed images. In the particular example shown in FIG. 13, the display control section 20f displays photographed images which correspond to a subject ID stored in the photographed image list table 75b as a “main subject ID” among the subject IDs of the specified list information as “main shots”, and displays such “main shots” to be distinguishable from other photographed images. This allows photographed images showing the specified desired subject as a main subject to be displayed separately from the other photographed images, and enables a photographer to grasp at a glance which subject is featured as a main subject in which photographed image. Photographed images may be deleted and organized on this screen. In other words, by selecting a desired photographed image and operating a “delete” button at the top of the screen, the selected photographed image is deleted from the HDD 75 or the like. When “setting various conditions” is selected on the camera mode selection screen, a condition setting screen (refer to FIG. 8) for setting determination of eyes shut/half-open, determination of face size, and various other conditions for narrowing down the images to be displayed on the photographed image list is displayed. To the extent Maxell contends Nakashima does not disclose this limitation, a person of ordinary skill in the art would have readily arrived at this limitation by combining or modifying it in view of their general knowledge and/or the prior art references disclosed in the corresponding section of Samsung’s Invalidity Contentions.
[8g] register a person in the image information as a specific person in	Nakashima discloses “register a person in the image information as a specific person in a mode selected from a first setting mode and a second setting mode, wherein, when the first setting mode is selected, a person

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a mode selected from a first setting mode and a second setting mode, wherein, when the first setting mode is selected, a person with a face is obtained by newly photographing the person in a photographing mode and thereafter registered as the specific person, and,	with a face is obtained by newly photographing the person in a photographing mode and thereafter registered as the specific person.” For example: Nakashima at Abstract An image capturing apparatus comprising: an image capturing element which receives subject light incident via a photographing lens, converts the subject light into a captured image signal, and outputs the signal; an A/D conversion section which converts the captured image signal outputted by the image capturing element into image data and outputs the image data; a storage section which stores at least the image data outputted by the A/D conversion section; a registration section which relates identification facial images which are image data to be used as criteria for identifying faces of subjects among the image data stored in the storage section to identification information of each subject, and registers related data into a database; a facial image extraction section which extracts facial images which are facial portion regions of a person from photographed images which are desired image data outputted by the A/D conversion section and stored in the storage section; an identification section which identifies from the database an identification facial image matching an extracted facial image which is a facial image extracted by the facial image extraction section; and a photograph quantity calculation section which calculates for each subject identification information a photograph quantity which is the total number of photographed images from which an extracted facial image matching an identification facial image corresponding to identification information for each subject has been extracted.

Nakashima at Fig. 4



Nakashima at Fig. 5

FIG.5

BASIC INFORMATION REGISTRATION TABLE

SUBJECT ID	NAME	REGISTERED FACIAL IMAGE
1	TARO FUJI	image001. jpg
2	HANAKO TAKAHASHI	image002. jpg
3	JIRO SUZUKI	image003. jpg
4	KAZUKO KATO	image004. jpg
5	SABURO YAMAMOTO	image005. jpg
⋮	⋮	⋮

Nakashima at Fig. 6

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure																																																											
	FIG. 7 PHOTOGRAPH QUANTITY BY SUBJECT LIST TABLE <table><thead><tr><th>SUBJECT ID</th><th>NAME</th><th>PHOTOGRAPH TARGET</th><th>PHOTOGRAPH QUANTITY</th><th>MAIN SHOT QUANTITY</th></tr></thead><tbody><tr><td>1</td><td>TARO FUJI</td><td>ON</td><td>5</td><td>2</td></tr><tr><td>2</td><td>HANAKO TAKAHASHI</td><td>ON</td><td>3</td><td>1</td></tr><tr><td>3</td><td>JIRO SUZUKI</td><td>OFF</td><td>0</td><td>0</td></tr><tr><td>4</td><td>KAZUO KATO</td><td>ON</td><td>0</td><td>0</td></tr><tr><td>5</td><td>SABURO YAMAMOTO</td><td>ON</td><td>1</td><td>0</td></tr><tr><td>...</td><td>...</td><td>...</td><td>...</td><td>...</td></tr></tbody></table> ~75c FIG. 6 PHOTOGRAPHED IMAGE LIST TABLE <table><thead><tr><th>IMAGE FILE NAME</th><th>SUBJECT ID</th><th>MAIN SUBJECT ID</th><th>FACE SIZE INAPPROPRIATE SUBJECT ID</th><th>EYES INAPPROPRIATE SUBJECT ID</th><th>EYES INAPPROPRIATE SUBJECT ID</th></tr></thead><tbody><tr><td>DISC00001.jpg</td><td>1, 2, 4, 5, 6</td><td>1</td><td>4</td><td>-</td><td>6</td></tr><tr><td>DISC00002.jpg</td><td>1, 2, 5, 6, 7, 8</td><td>2</td><td>5</td><td>7</td><td>6</td></tr><tr><td>...</td><td>...</td><td>...</td><td>...</td><td>...</td><td>...</td></tr></tbody></table> ~75b Nakashima at Fig. 7	SUBJECT ID	NAME	PHOTOGRAPH TARGET	PHOTOGRAPH QUANTITY	MAIN SHOT QUANTITY	1	TARO FUJI	ON	5	2	2	HANAKO TAKAHASHI	ON	3	1	3	JIRO SUZUKI	OFF	0	0	4	KAZUO KATO	ON	0	0	5	SABURO YAMAMOTO	ON	1	0	...	...	...	...	...	IMAGE FILE NAME	SUBJECT ID	MAIN SUBJECT ID	FACE SIZE INAPPROPRIATE SUBJECT ID	EYES INAPPROPRIATE SUBJECT ID	EYES INAPPROPRIATE SUBJECT ID	DISC00001.jpg	1, 2, 4, 5, 6	1	4	-	6	DISC00002.jpg	1, 2, 5, 6, 7, 8	2	5	7	6	...	...	...	...	...	...
SUBJECT ID	NAME	PHOTOGRAPH TARGET	PHOTOGRAPH QUANTITY	MAIN SHOT QUANTITY																																																								
1	TARO FUJI	ON	5	2																																																								
2	HANAKO TAKAHASHI	ON	3	1																																																								
3	JIRO SUZUKI	OFF	0	0																																																								
4	KAZUO KATO	ON	0	0																																																								
5	SABURO YAMAMOTO	ON	1	0																																																								
...	...	...	...	...																																																								
IMAGE FILE NAME	SUBJECT ID	MAIN SUBJECT ID	FACE SIZE INAPPROPRIATE SUBJECT ID	EYES INAPPROPRIATE SUBJECT ID	EYES INAPPROPRIATE SUBJECT ID																																																							
DISC00001.jpg	1, 2, 4, 5, 6	1	4	-	6																																																							
DISC00002.jpg	1, 2, 5, 6, 7, 8	2	5	7	6																																																							
...	...	...	...	...	...																																																							

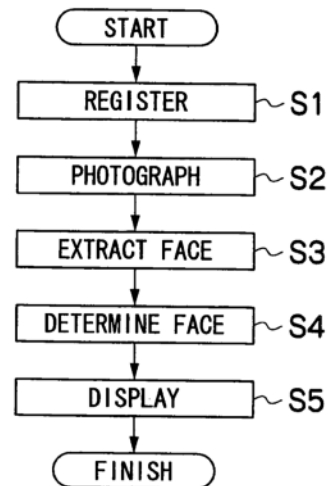
Nakashima at Fig. 8

FIG.8

FACE SIZE:		% OR OVER
EYES:		HALF-OPEN INVALID
LINE OF SIGHT:		ONLY STRAIGHT INTO CAMERA VALID
MAIN SHOT:		VALID
MINIMUM PHOTOGRAPH QUANTITY:		PHOTOGRAPHS
TARGET DATE AND TIME:		
FROM		
TO		
ESTIMATED FINISH:		
SET CANCEL		

Nakashima at Fig. 9

FIG.9



Nakashima at Fig. 10

FIG.10

FIG.10 is a menu screen with a rectangular border. Inside, there are four horizontal rectangular buttons stacked vertically. The top button contains the text "DISPLAY PHOTOGRAPH COUNT NUMBER LIST". The second button contains "SET VARIOUS CONDITIONS". The third button contains "RE-EXECUTE PHOTOGRAPH COUNT (REAFFIRM)". The bottom button contains "CANCEL".

Nakashima at Fig. 11

FIG.11

FIG.11 is a screen displaying a table with 5 columns: ID, NAME, TARGET, PHOTOGRAPH QUANTITY, and MAIN QUANTITY. The table contains 5 rows of data. Below the table are two buttons: "DISPLAY DETAILS" and "BACK".

ID	NAME	TARGET	PHOTOGRAPH QUANTITY	MAIN QUANTITY
4	KAZUKO KATO	ON	0	0
5	SABURO YAMAMOTO	ON	1	0
2	HANAKO TAKAHASHI	ON	3	1
1	TARO FUJI	ON	5	2
3	JIRO SUZUKI	OFF	0	0

Nakashima at Fig. 12

FIG.12

A rectangular frame containing a screen display. On the left is a large box labeled "FACE DATA". To its right, the following text is displayed: "SUBJECT ID:1", "NAME: TARO FUJI", "PHOTOGRAPH COUNT: 5", "MAIN SHOT QUANTITY: 2", and "PHOTOGRAPH TARGET: ON". At the bottom left is a button labeled "DISPLAY PHOTOGRAPHED IMAGE LIST", and at the bottom right is a button labeled "BACK".

Nakashima at Fig. 13

FIG.13

A rectangular frame containing a screen display. At the top left is the label "MAIN SHOT:". To its right are two buttons: "MAIN SHOT 1" and "MAIN SHOT 2". Below this is the label "OTHERS:". Underneath are two buttons: "OTHER 1" and "OTHER 2", followed by a dotted line ".....". At the bottom are two buttons: "DELETE" and "BACK".

Nakashima at [0004]

Conventionally, techniques have existed which allow a user to know who is captured in a photographed image. For instance, a digital camera disclosed in Japanese Patent Application Laid-Open 2004-62868 comprises: a photosensor configured to capture images; an access device for accessing a face database used for storing names and face identification information related to individuals; a processor configured to evaluate loaded images to locate faces, and match the located faces to face identification information stored in the face database; and a communication device for communicating with a user, configured to request the name of a person when the face in an image does not match the face stored in the face database at the present moment.

Nakashima at [0007]

In order to solve the above problem, an image capturing apparatus according to the present invention comprises: an image capturing element which receives subject light incident via a photographing lens, converts the subject light into a captured image signal, and outputs the signal; an A/D conversion section which converts the captured image signal outputted by the image capturing element into image data and outputs the image data; a storage section which stores at least the image data outputted by the A/D conversion section; a registration section which relates identification facial images which are image data to be used as criteria for identifying faces of subjects among the image data stored in the storage section to identification information of each object, and registers related data into a database; a facial image extraction section which extracts facial images which are facial portion regions of a person from photographed images which are desired image data outputted by the A/D conversion section and stored in the storage section; an identification section which identifies from the database an identification facial image matching an extracted facial image which is a facial image extracted by the facial image extraction section; and a photograph quantity calculation section which calculates for each subject identification information a photograph quantity which is the total number of photographed images from which an extracted facial image matching an identification facial image corresponding to identification information for each subject has been extracted.

Nakashima at [0008]–[0010]

In the image capturing apparatus according to the present invention, by registering in advance a facial image of each individual intended to be a subject, the number of photographed images from which facial images matching each facial image have been extracted is calculated. Displaying this photograph quantity with a LCD and the like, or notifying the photograph quantity through audio or the like, a user may easily learn how many photographs have been taken for which subject. Therefore, it becomes possible to prevent, as much as possible, occurrences of biases among the photograph quantities of

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	subjects, such as cases where a desired photograph quantity is not taken for certain subjects or no photographs are taken for certain subjects. A photograph quantity corresponding to the identification information of each subject is preferably displayed at a predefined timing. “Predefined timing” means before or after start of photographing, or more specifically, upon half-pressing or full-pressing a release switch, upon setting or deactivating settings of photographing modes, or upon transition to a predefined mode for confirming a photograph quantity. The image capturing apparatus may further comprise a main subject determination section which determines which subject is a main subject based on photographed images and extracted facial images extracted from the photographed images. Nakashima at [0116]–[0118] The face extraction section 20a extracts facial regions, which are regions that include facial portions of individuals, from images stored in the HDD 75 or images that are sequentially stored in the buffer memory 135 (these images may be hereinafter referred to as “original images”). As for the method for extracting facial regions, for instance, a technique disclosed in Japanese Patent Application Laid-Open No. 09-101579 “Facial Region Extraction Method and Copying Condition Determination Method” by the present inventor may be applied. This technique determines whether the hue of each pixel of a photographed image falls in a skin color range in order to divide the image into a skin-colored region and a non-skin-colored region, and detects edges in the image in order to classify each location in the image to either edge portions or non-edge portions. A region within a skin-colored region comprising pixels classified as non-edge portions and surrounded by pixels determined to be edge portions is extracted as a face candidate region. The extracted face candidate region is determined whether it corresponds to a face of a person, and is then extracted as a facial region based on the determination results. Alternatively, facial regions may be extracted using methods described in Japanese Patent Application Laid-Open No. 2003-209683 or Japanese Patent Application Laid-Open No. 2002-199221. In the following description, images of facial regions extracted from original images by the face extraction portion 20a will be referred to as “extracted facial images”. Nakashima at [0121] The face determination section 20d identifies a registration facial image matching an extracted facial image extracted by the face extraction section 20a from a basic information registration table 75a in the HDD 75, herein after-mentioned, and identifies the subject ID corresponding to the identified registration

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	facial image. Various facial recognition techniques may be used to determine matches between registration facial images and extracted facial images. For instance, matches may be determined based on face sizes, face contours, eye positions or the like. Nakashima at [0123] Registration facial images are acquired by a photographer using the digital camera 100 by individually photographing the face of each subject. Alternatively, registration facial images may be inputted to the HDD 75 from various electronic devices such as an external server or a camera via the communication port 107. The photographer photographs a subject at a size and clarity sufficient for identifying the face of the subject, and inputs the “name” of the subject through the operation section 120. The subject management section 20e attaches a unique subject ID through the operation section 120 to the facial image, and relates the facial image to the inputted name and stores the facial image in the basic information registration table 75a. Facial images stored in the basic information registration table 75a become registered facial images. Stored contents of the basic information registration table 75a may be displayed on the liquid crystal panel 71 by performing predefined menu operations. The stored contents may also be added, changed, deleted or updated. Nakashima at [0124]–[0130] Referring now to FIG. 6, a photographed image list table 75b is stored in the hard disk 75. In this table, photographed images which are images obtained by fully pressing the release switch 104; subject IDs identified from the images by the face determination section 20d (in other words, identification information of the subjects shown in the image); main subject IDs which are the subject IDs of main subjects in the images; “face size inappropriate subject IDs” which are subject ID for subjects photographed at a size inappropriate for viewing or printing; “eyes inappropriate (half-open) subject IDs” which are subject IDs for subjects with eyes shut or half-open; and “line of sight inappropriate subject IDs” which are subject IDs for subjects whose lines of sight are inappropriate, are related to each other and stored. Determination of which subject's subject ID should be stored in the photographed image list table as a “main subject ID”, a “face size inappropriate subject ID”, an “eyes inappropriate (half-open) subject ID” or a “line of sight inappropriate subject ID” may be either performed through software processing executed by the CPU 20, or through arbitrary operation of the operation section 120 by the user. For instance, the face determination section 20 determines whether an extracted facial image detected by the face extraction section 20a is under a predefined size (for example, an absolute threshold such as 100 by 100 pixels, or a relative threshold such as the area ratio of the extracted image to the original image)

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	(face size determination). If the extracted facial image is under the predefined size, a subject ID corresponding to a registered facial image matching a facial image of the facial region is related to the image as a “face size inappropriate subject ID”, and stored in the photographed image list table 75b. Alternatively, the face determination section 20 stores a subject ID corresponding to a registered facial image matching a facial region in which the eyes are determined by the eyes open/shut detection section 20c to be shut and/or half-open as an eyes inappropriate (half-open) subject ID into the photographed image list table 75b. In addition, the face determination section 20 displays a list of extracted facial images detected by the face extraction section 20a onto the image display LCD 102 to have the user select an extracted facial image where the line of sight is deviated, and stores a subject ID corresponding to a registered facial image matching the selected extracted facial image as a line of sight inappropriate subject ID into the photographed image list table 75b. Alternatively, the face determination section 20 determines whether an extracted facial image is a main subject based on whether the extracted facial image was at a predefined position, such as the focus position of the AF detection section 150 or the vicinity of the center of the original image upon half-pressing of the release switch 104 (main subject determination). However, if there is only one extracted facial image, the extracted facial image is determined to be the main subject regardless of whether it is positioned at a predefined position. When an extracted facial image is determined to be the main subject, a subject ID corresponding to a registered facial image matching the extracted facial image is stored in the photographed image list table 75b as a main subject ID. While the above-described face extraction section 20a, eye region detection section 20b, eye open/shut detection section 20c, face determination section 20d, subject management section 20e, and the display control section 20f are programs executed by the main CPU 20, a variation configured so that either a portion of or all of the above programs are implemented in a dedicated semiconductor integrated circuit (ASIC or Application Specific Integrated Circuit) is also possible. This variation is preferable, since it reduces the load on the main CPU 20. Nakashima at [0131]–[0133] Referring now to FIG. 7, a photograph quantity by subject list table 75c is stored in the hard disk 75. Among the images stored in the HDD 75, to all original images or desired original images specified via the operation section 120, the photograph quantity by subject list table 75c relates: “photograph quantities” which indicate the total number of original images containing an extracted facial image matching a registered facial image; “photograph targets” which are flags indicating whether an original image will be a target of face extraction by the face extraction section 20a; “main shot quantities” which

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	are the total number of original images in which the extracted facial image is the main subject; and “subject IDs” and “names” corresponding to registered facial images matching the extracted facial images. Counting of the photograph quantity for each subject is performed by the subject management section 20e by individually adding up the number of extracted facial images, among those extracted from the original image by the face extraction section 20a, which match a certain registered facial image for each registered image. In addition, counting of the main shot quantity for each subject is performed by the subject management section 20e by individually adding up the number of extracted facial images positioned at the focus position of the AF detection section 150 or the vicinity of the center of the original image during photography for each registered image matching the extracted facial images. While a description will be provided later, the subject management section 20e may also be arranged to exclude original images which include extracted facial images corresponding to subject IDs stored as “face size inappropriate subject IDs”, “eyes inappropriate (half-open) subject IDs” or “line of sight inappropriate subject IDs” from the aggregate total of the photograph quantities. Nakashima at [0145] First, in step S1, a photographer who intends to photograph one or a plurality of subjects specified in advance sets the switching lever 122 to “photograph”, and individually photographs the face of each subject. For this purpose, it is preferable that the faces are photographed at clear and appropriate sizes to allow detection of the facial regions by the face detection section 20a. Each photographed facial image is displayed on the liquid crystal panel 71. The subject management section 20e accepts input of “names” of subjects through the graphical user interface (GUI), not shown, displayed on the liquid crystal panel 71. Nakashima at [0146] Next, after confirming whether a photographed facial image should be registered in the basic information registration table 75a, when a designation for registration is forwarded from the operation section 120, the subject management section 20e attaches a unique subject ID to the photographed facial image, relates the name, facial image and the subject ID inputted through the operation section 120 to each other, and stores the related information into the basic information registration table 75a. Nakashima at [0147] Facial images to be stored in the basic information registration table 75a by the subject management section 20e do not necessarily have to be images obtained based on image capturing signals of the CCD 132. As long as facial images are photographed at an appropriate size and with appropriate clarity, facial

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	images may be, for instance, received from an external server via the communication port 107 or read out from the memory card 200. Start/finish of operation of the GUI for registering facial images may be switched back and forth by operating the operation section 120 during the photography mode. Nakashima at [0148] In step S2, photography is performed independently of facial image registration in a state where the facial image registration GUI is disabled in photography mode. An original image obtained through photography is stored in the memory card 200 or the HDD 75. Accordingly, the subject management section 20e adds the file name of the newly obtained photographed image to the photographed image list table 75b. Nakashima at [0149]–[0150] In step S3, the face extraction section 20a extracts a facial region (in other words, an extracted facial image) from the photographed image. In step S4, the face determination section 20d identifies a registered facial image which matches each extracted facial image from the basic information registration table 75a. Furthermore, the face determination section 20d also identifies a subject ID corresponding to the identified registered facial image. The face determination section 20d relates the identified subject ID to the file name of the original image, and adds the subject ID to the “subject ID” in the photographed image list table 75b. In other words, whenever photography is performed, identification information of the subject in the photographed image is stored into the photographed image list table 75b. Nakashima at [0156]–[0158] FIG. 10 shows an example of a camera mode selection screen. In this camera mode selection screen, buttons for specifying four types of operations, namely “display photograph count list”, “set various conditions”, “re-execute photograph count” and “cancel”, are displayed. Each menu may be selected/specified using the cross-shape key 124 or the like in the operation section to execute operations corresponding to each selected mode. “Re-execute photograph count” is a button used to give the re-execution instruction of step S4. The processing of step S4 is executed upon operation of this button. When “display photograph count list” is selected, the display control section 20f displays information stored in the photograph quantity by subject list table 75c on the liquid crystal panel 71.

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	Nakashima at [0159] FIG. 11 is an example of a list display of the contents of the photograph quantity by subject list table 75c. As shown in FIG. 11, list information composed of a subject ID, name, photograph target flag, photograph quantity, and number of main subjects related to each other in the photograph quantity by subject list table 75c is displayed in list format on the liquid crystal panel 71. At this point, the list information may be displayed after sorting in ascending/descending order of photograph quantity per subject. This allows a photographer to easily acknowledge which subject has had fewer or more photographs taken than others, and is useful in preventing or correcting occurrences of biases among the photograph quantity to be subsequently taken for the subjects. Nakashima at [0161] FIG. 12 shows a display example of individual information. For instance, in addition to specified list information (subject ID, name, photograph quantity, main shot quantity, photograph target flag), a registered facial image is displayed on this screen. A photographer may reference this screen and confirm which subject has had fewer or more photographs taken than others while looking at the faces or names of the subjects. To the extent Maxell contends Nakashima does not disclose this limitation, a person of ordinary skill in the art would have readily arrived at this limitation by combining or modifying it in view of their general knowledge and/or the prior art references disclosed in the corresponding section of Samsung's Invalidity Contentions.
[8h] when the second setting mode is selected, a person with a face in the image information is selected from a plurality of faces in the image information recorded in the recording medium and thereafter registered as the specific person; and	Nakashima discloses “when the second setting mode is selected, a person with a face in the image information is selected from a plurality of faces in the image information recorded in the recording medium and thereafter registered as the specific person.” For example:

Nakashima at Fig. 5

FIG.5

BASIC INFORMATION REGISTRATION TABLE

SUBJECT ID	NAME	REGISTERED FACIAL IMAGE
1	TARO FUJI	image001. jpg
2	HANAKO TAKAHASHI	image002. jpg
3	JIRO SUZUKI	image003. jpg
4	KAZUKO KATO	image004. jpg
5	SABURO YAMAMOTO	image005. jpg
⋮	⋮	⋮

~75a

Nakashima at Fig. 6

FIG.6

PHOTOGRAPHED IMAGE LIST TABLE					
IMAGE FILE NAME	SUBJECT ID	MAIN SUBJECT ID	FACE SIZE		EYES INAPPROPRIATE SUBJECT ID
			INAPPROPRIATE SUBJECT ID	INAPPROPRIATE SUBJECT ID	
00000001. jpg	1, 2, 4, 5, 6	1	4	7	6
00000002. jpg	1, 2, 3, 5, 7, 8	2	5	7	6
⋮	⋮	⋮	⋮	⋮	⋮

~75b

Nakashima at Fig. 7

FIG.7

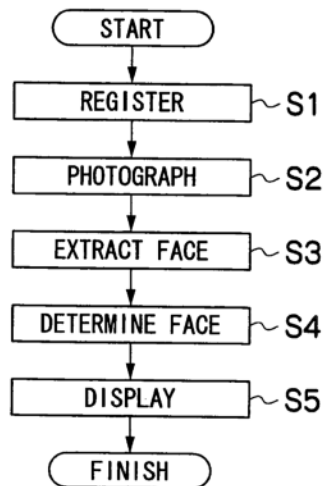
PHOTOGRAPH QUANTITY BY SUBJECT LIST TABLE

SUBJECT ID	NAME	PHOTOGRAPH TARGET	PHOTOGRAPH QUANTITY	MAIN SHOT QUANTITY
1	TARO FUJI	ON	5	2
2	HANAKO TAKAHASHI	ON	3	1
3	JIRO SUZUKI	OFF	0	0
4	KAZUKO KATO	ON	0	0
5	SHIROO TANABATO	ON	1	0
...	...	...	...	...

75c

Nakashima at Fig. 9

FIG.9



Nakashima at Fig. 10

FIG.10

FIG.10 is a menu screen with a rectangular border. Inside, there are four horizontal rectangular buttons stacked vertically. The top button contains the text "DISPLAY PHOTOGRAPH COUNT NUMBER LIST". The second button contains "SET VARIOUS CONDITIONS". The third button contains "RE-EXECUTE PHOTOGRAPH COUNT (REAFFIRM)". The bottom button contains "CANCEL".

Nakashima at Fig. 11

FIG.11

FIG.11 is a screen displaying a table with 5 columns: ID, NAME, TARGET, PHOTOGRAPH QUANTITY, and MAIN QUANTITY. The table contains 6 rows of data. Below the table are two buttons: "DISPLAY DETAILS" and "BACK".

ID	NAME	TARGET	PHOTOGRAPH QUANTITY	MAIN QUANTITY
4	KAZUKO KATO	ON	0	0
5	SABURO YAMAMOTO	ON	1	0
2	HANAKO TAKAHASHI	ON	3	1
1	TARO FUJI	ON	5	2
3	JIRO SUZUKI	OFF	0	0

Nakashima at Fig. 12

FIG.12

FACE DATA	SUBJECT ID:1
	NAME: TARO FUJI
	PHOTOGRAPH COUNT: 5
	MAIN SHOT QUANTITY: 2
	PHOTOGRAPH TARGET: ON
DISPLAY PHOTOGRAPHED IMAGE LIST	BACK

Nakashima at Fig. 13

FIG.13

MAIN SHOT:	MAIN SHOT 1	MAIN SHOT 2
OTHERS:		
OTHER 1	OTHER 2	
DELETE	BACK	

Nakashima at [0123]

Registration facial images are acquired by a photographer using the digital camera 100 by individually photographing the face of each subject. Alternatively, registration facial images may be inputted to the HDD 75 from various electronic devices such as an external server or a camera via the communication port 107. The photographer photographs a subject at a size and clarity sufficient for identifying the face of the subject, and inputs the “name” of the subject through the operation section 120. The subject management section 20e attaches a unique subject ID through the operation section 120 to the facial image, and relates the facial image to the inputted name and stores the facial image in the basic information registration table 75a. Facial images stored in the basic information registration table 75a become registered facial images. Stored contents of the basic information registration table 75a may be displayed on the liquid crystal panel 71 by performing predefined menu operations. The stored contents may also be added, changed, deleted or updated.

Nakashima at [0145]

First, in step S1, a photographer who intends to photograph one or a plurality of subjects specified in advance sets the switching lever 122 to “photograph”, and individually photographs the face of each subject. For this purpose, it is preferable that the faces are photographed at clear and appropriate sizes to allow detection of the facial regions by the face detection section 20a. Each photographed facial image is displayed on the liquid crystal panel 71. The subject management section 20e accepts input of “names” of subjects through the graphical user interface (GUI), not shown, displayed on the liquid crystal panel 71.

Nakashima at [0146]

Next, after confirming whether a photographed facial image should be registered in the basic information registration table 75a, when a designation for registration is forwarded from the operation section 120, the subject management section 20e attaches a unique subject ID to the photographed facial image, relates the name, facial image and the subject ID inputted through the operation section 120 to each other, and stores the related information into the basic information registration table 75a.

Nakashima at [0147]

Facial images to be stored in the basic information registration table 75a by the subject management section 20e do not necessarily have to be images obtained based on image capturing signals of the CCD 132. As long as facial images are photographed at an appropriate size and with appropriate clarity, facial images may be, for instance, received from an external server via the communication port 107 or read out

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	from the memory card 200. Start/finish of operation of the GUI for registering facial images may be switched back and forth by operating the operation section 120 during the photography mode. Nakashima at [0156]–[0158] FIG. 10 shows an example of a camera mode selection screen. In this camera mode selection screen, buttons for specifying four types of operations, namely “display photograph count list”, “set various conditions”, “re-execute photograph count” and “cancel”, are displayed. Each menu may be selected/specified using the cross-shape key 124 or the like in the operation section to execute operations corresponding to each selected mode. “Re-execute photograph count” is a button used to give the re-execution instruction of step S4. The processing of step S4 is executed upon operation of this button. When “display photograph count list” is selected, the display control section 20f displays information stored in the photograph quantity by subject list table 75c on the liquid crystal panel 71. Nakashima at [0159] FIG. 11 is an example of a list display of the contents of the photograph quantity by subject list table 75c. As shown in FIG. 11, list information composed of a subject ID, name, photograph target flag, photograph quantity, and number of main subjects related to each other in the photograph quantity by subject list table 75c is displayed in list format on the liquid crystal panel 71. At this point, the list information may be displayed after sorting in ascending/descending order of photograph quantity per subject. This allows a photographer to easily acknowledge which subject has had fewer or more photographs taken than others, and is useful in preventing or correcting occurrences of biases among the photograph quantity to be subsequently taken for the subjects. To the extent Maxell contends Nakashima does not disclose this limitation, a person of ordinary skill in the art would have readily arrived at this limitation by combining or modifying it in view of their general knowledge and/or the prior art references disclosed in the corresponding section of Samsung’s Invalidity Contentions.
[8i] selectively reproduce the recorded image information which includes the registered specific person.	Nakashima discloses “selectively reproduce the recorded image information which includes the registered specific person.” For example:

Nakashima at Fig. 5

FIG.5

BASIC INFORMATION REGISTRATION TABLE

SUBJECT ID	NAME	REGISTERED FACIAL IMAGE
1	TARO FUJI	image001. jpg
2	HANAKO TAKAHASHI	image002. jpg
3	JIRO SUZUKI	image003. jpg
4	KAZUKO KATO	image004. jpg
5	SABURO YAMAMOTO	image005. jpg
⋮	⋮	⋮

~75a

Nakashima at Fig. 6

FIG.6

PHOTOGRAPHED IMAGE LIST TABLE					
IMAGE FILE NAME	SUBJECT ID	MAIN SUBJECT ID	FACE SIZE		EYES INAPPROPRIATE SUBJECT ID
			INAPPROPRIATE SUBJECT ID	INAPPROPRIATE SUBJECT ID	
00000001. jpg	1, 2, 4, 5, 6	1	4	7	6
00000002. jpg	1, 2, 3, 5, 7, 8	2	5	7	6
⋮	⋮	⋮	⋮	⋮	⋮

~75b

Nakashima at Fig. 7

FIG.7

PHOTOGRAPH QUANTITY BY SUBJECT LIST TABLE

SUBJECT ID	NAME	PHOTOGRAPH TARGET	PHOTOGRAPH QUANTITY	MAIN SHOT QUANTITY
1	TARO FUJI	ON	5	2
2	HANAKO TAKAHASHI	ON	3	1
3	JIRO SUZUKI	OFF	0	0
4	KAZUKO KATO	ON	0	0
5	SHIGURO YAMAMOTO	ON	1	0
....				

~75c

Nakashima at Fig. 8

FIG.8

FACE SIZE:

% OR OVER

EYES:

HALF-OPEN INVALID

LINE OF SIGHT:

ONLY STRAIGHT INTO CAMERA VALID

MAIN SHOT:

VALID

MINIMUM PHOTOGRAPH QUANTITY:

PHOTOGRAPHS

TARGET DATE AND TIME:

FROM

TO

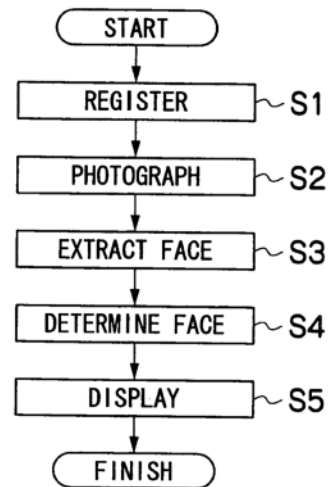
ESTIMATED FINISH:

SET

CANCEL

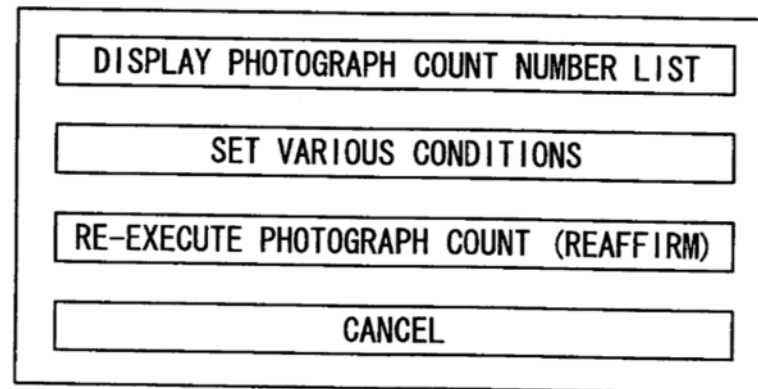
Nakashima at Fig. 9

FIG.9



Nakashima at Fig. 10

FIG.10



Nakashima at Fig. 11

FIG.11

ID	NAME	TARGET	PHOTOGRAPH QUANTITY	MAIN QUANTITY
4	KAZUKO KATO	ON	0	0
5	SABURO YAMAMOTO	ON	1	0
2	HANAKO TAKAHASHI	ON	3	1
1	TARO FUJI	ON	5	2
3	JIRO SUZUKI	OFF	0	0

DISPLAY DETAILS

BACK

Nakashima at Fig. 12

FIG.12

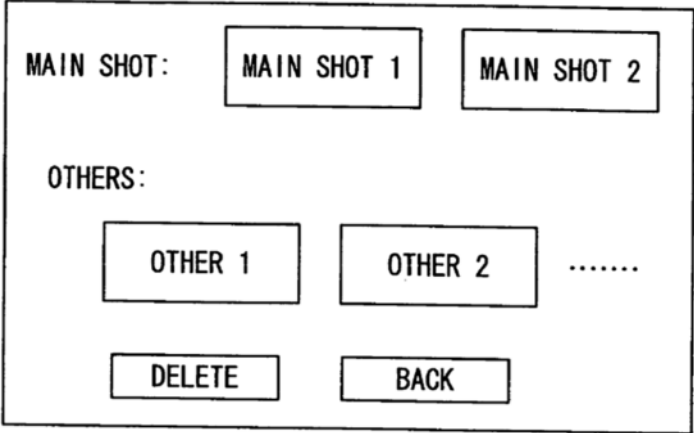
FACE DATA

SUBJECT ID:1
NAME: TARO FUJI
PHOTOGRAPH COUNT: 5
MAIN SHOT QUANTITY: 2
PHOTOGRAPH TARGET: ON

DISPLAY PHOTOGRAPHED
IMAGE LIST

BACK

Nakashima at Fig. 13

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	FIG.13  Nakashima at [0011]–[0012] Moreover, the photograph quantity calculation section may be arranged to calculate a main subject photograph quantity which is the total number of photographed images in which extracted facial images of a subject determined to be the main subject by the main subject determination section are extracted, while the display section may display the main subject photograph quantity at a predefined timing. In other words, by limiting the displayed number of photographed images to only those for the main subject, the number of photographed images featuring the main subject can be learned in a convenient manner. Nakashima at [0124]–[0130] Referring now to FIG. 6, a photographed image list table 75b is stored in the hard disk 75. In this table, photographed images which are images obtained by fully pressing the release switch 104; subject IDs identified from the images by the face determination section 20d (in other words, identification information of the subjects shown in the image); main subject IDs which are the subject IDs of main subjects in the images; “face size inappropriate subject IDs” which are subject ID for subjects photographed at a size inappropriate for viewing or printing; “eyes inappropriate (half-open) subject IDs” which are subject IDs for subjects with eyes shut or half-open; and “line of sight inappropriate subject

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	IDs” which are subject IDs for subjects whose lines of sight are inappropriate, are related to each other and stored. Determination of which subject's subject ID should be stored in the photographed image list table as a “main subject ID”, a “face size inappropriate subject ID”, an “eyes inappropriate (half-open) subject ID” or a “line of sight inappropriate subject ID” may be either performed through software processing executed by the CPU 20, or through arbitrary operation of the operation section 120 by the user. For instance, the face determination section 20 determines whether an extracted facial image detected by the face extraction section 20a is under a predefined size (for example, an absolute threshold such as 100 by 100 pixels, or a relative threshold such as the area ratio of the extracted image to the original image) (face size determination). If the extracted facial image is under the predefined size, a subject ID corresponding to a registered facial image matching a facial image of the facial region is related to the image as a “face size inappropriate subject ID”, and stored in the photographed image list table 75b. Alternatively, the face determination section 20 stores a subject ID corresponding to a registered facial image matching a facial region in which the eyes are determined by the eyes open/shut detection section 20c to be shut and/or half-open as an eyes inappropriate (half-open) subject ID into the photographed image list table 75b. In addition, the face determination section 20 displays a list of extracted facial images detected by the face extraction section 20a onto the image display LCD 102 to have the user select an extracted facial image where the line of sight is deviated, and stores a subject ID corresponding to a registered facial image matching the selected extracted facial image as a line of sight inappropriate subject ID into the photographed image list table 75b. Alternatively, the face determination section 20 determines whether an extracted facial image is a main subject based on whether the extracted facial image was at a predefined position, such as the focus position of the AF detection section 150 or the vicinity of the center of the original image upon half-pressing of the release switch 104 (main subject determination). However, if there is only one extracted facial image, the extracted facial image is determined to be the main subject regardless of whether it is positioned at a predefined position. When an extracted facial image is determined to be the main subject, a subject ID corresponding to a registered facial image matching the extracted facial image is stored in the photographed image list table 75b as a main subject ID. While the above-described face extraction section 20a, eye region detection section 20b, eye open/shut detection section 20c, face determination section 20d, subject management section 20e, and the display control section 20f are programs executed by the main CPU 20, a variation configured so that either a portion of or all of the above programs are implemented in a dedicated semiconductor integrated circuit

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	(ASIC or Application Specific Integrated Circuit) is also possible. This variation is preferable, since it reduces the load on the main CPU 20. Nakashima at [0131]–[0133] Referring now to FIG. 7, a photograph quantity by subject list table 75c is stored in the hard disk 75. Among the images stored in the HDD 75, to all original images or desired original images specified via the operation section 120, the photograph quantity by subject list table 75c relates: “photograph quantities” which indicate the total number of original images containing an extracted facial image matching a registered facial image; “photograph targets” which are flags indicating whether an original image will be a target of face extraction by the face extraction section 20a; “main shot quantities” which are the total number of original images in which the extracted facial image is the main subject; and “subject IDs” and “names” corresponding to registered facial images matching the extracted facial images. Counting of the photograph quantity for each subject is performed by the subject management section 20e by individually adding up the number of extracted facial images, among those extracted from the original image by the face extraction section 20a, which match a certain registered facial image for each registered image. In addition, counting of the main shot quantity for each subject is performed by the subject management section 20e by individually adding up the number of extracted facial images positioned at the focus position of the AF detection section 150 or the vicinity of the center of the original image during photography for each registered image matching the extracted facial images. While a description will be provided later, the subject management section 20e may also be arranged to exclude original images which include extracted facial images corresponding to subject IDs stored as “face size inappropriate subject IDs”, “eyes inappropriate (half-open) subject IDs” or “line of sight inappropriate subject IDs” from the aggregate total of the photograph quantities. Nakashima at [0136]–[0143] FIG. 8 shows a condition setting screen which is an example of the GUI. Items settable by the condition setting screen are: a “face size” which is a relative area ratio threshold used for face size determination of an extracted facial image to an original image; whether facial images with eyes half-open will be considered valid/invalid as extracted facial images; whether only extracted facial images with subjects looking straight into the camera will be calculated for photograph quantities and main shot quantities; whether only extracted facial images in which their subjects are main subjects will be calculated for main shot quantities; a “minimum photograph quantity” which is a prescribed photograph quantity; an original image range which the face extraction section 20a targets for extracting facial regions (in this example,

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	“from (start)” and “to (end)” of time and date of photography; and an estimated time of finish of photography of a subject. The relationships between the setting items of the condition setting screen and the operation conditions of the programs are as follows. The face determination section 20d references an area ratio threshold set so as to correspond to a subject ID to determine whether the relative area ratio of a registered facial image corresponding to that subject ID to its original image exceeds the threshold. If not, the subject ID is stored as a “face size inappropriate subject ID”. Additionally, if “half-open invalid” is checked for a subject ID, in addition to an extracted facial image in which the eyes are completely shut, the eyes open/shut detection section 20c also stores an extracted facial image in which the eyes are neither completely shut nor completely open (so-called half-open) as an “eyes inappropriate (half-open) subject ID”. Moreover, the subject management section 20e calculates an aggregate total of “main shot IDs” only when “main shot” is checked for a subject ID. If a “minimum photography quantity” of 1 or above is set for a subject ID, the subject management section 20e references the “photograph quantity” corresponding to that subject ID at a predefined timing (for instance, the time set as “estimated finish”, or after a lapse of a predefined time, such as 15 minutes, after setting to photography mode). If the “photograph quantity” is under the “minimum photography quantity”, a predefined warning is displayed on the liquid crystal 71. Alternatively, a warning message indicating the name of a subject for which the “photograph quantity” is under the “minimum photography quantity” may be played back through a speaker, not shown. This allows the photographer to easily acknowledge which subject's photograph quantity has not reached a prescribed quantity without having to go through the trouble of visually confirming the photograph quantity. Furthermore, if “from” and “to” have been set, the face extraction section 20a performs face extraction only on original images with image recording dates/times recorded in datetimeoriginal tags or the like which are within the range defined by “from” and “to”. This allows a photographer to arbitrarily specify at what timing images should be photographed to become targets of facial extraction, and is therefore preferable. These setting items are individually settable for each subject ID, and set items are only valid for registered facial images corresponding to each subject ID. Conditions set with this screen are related to subject IDs and stored in the EEPROM 146 or the like, and will become the conditions to which the main CPU 20 conforms when executing the various programs.

Nakashima at [0156]–[0158]

FIG. 10 shows an example of a camera mode selection screen. In this camera mode selection screen, buttons for specifying four types of operations, namely “display photograph count list”, “set various conditions”, “re-execute photograph count” and “cancel”, are displayed. Each menu may be selected/specified using the cross-shape key 124 or the like in the operation section to execute operations corresponding to each selected mode.

“Re-execute photograph count” is a button used to give the re-execution instruction of step S4. The processing of step S4 is executed upon operation of this button.

When “display photograph count list” is selected, the display control section 20f displays information stored in the photograph quantity by subject list table 75c on the liquid crystal panel 71.

Nakashima at [0159]

FIG. 11 is an example of a list display of the contents of the photograph quantity by subject list table 75c. As shown in FIG. 11, list information composed of a subject ID, name, photograph target flag, photograph quantity, and number of main subjects related to each other in the photograph quantity by subject list table 75c is displayed in list format on the liquid crystal panel 71. At this point, the list information may be displayed after sorting in ascending/descending order of photograph quantity per subject. This allows a photographer to easily acknowledge which subject has had fewer or more photographs taken than others, and is useful in preventing or correcting occurrences of biases among the photograph quantity to be subsequently taken for the subjects.

Nakashima at [0161]

FIG. 12 shows a display example of individual information. For instance, in addition to specified list information (subject ID, name, photograph quantity, main shot quantity, photograph target flag), a registered facial image is displayed on this screen. A photographer may reference this screen and confirm which subject has had fewer or more photographs taken than others while looking at the faces or names of the subjects.

Nakashima at [0163]

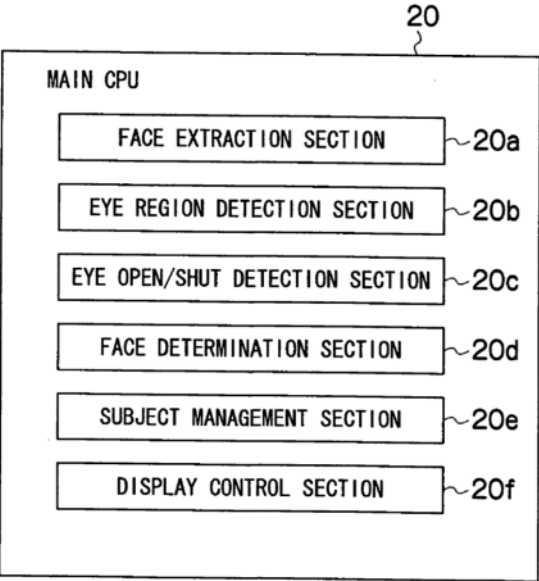
A “photographed image list display” button is provided on this screen. When the “photographed image list display” button is selected, the display control section 20f displays a list of photographed images corresponding to the subject ID of the specified list information.

Nakashima at [0165]–[0167]

FIG. 13 shows a list display example of photographed images. In the particular example shown in FIG. 13, the display control section 20f displays photographed images which correspond to a subject ID stored

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	in the photographed image list table 75b as a “main subject ID” among the subject IDs of the specified list information as “main shots”, and displays such “main shots” to be distinguishable from other photographed images. This allows photographed images showing the specified desired subject as a main subject to be displayed separately from the other photographed images, and enables a photographer to grasp at a glance which subject is featured as a main subject in which photographed image. Photographed images may be deleted and organized on this screen. In other words, by selecting a desired photographed image and operating a “delete” button at the top of the screen, the selected photographed image is deleted from the HDD 75 or the like. When “setting various conditions” is selected on the camera mode selection screen, a condition setting screen (refer to FIG. 8) for setting determination of eyes shut/half-open, determination of face size, and various other conditions for narrowing down the images to be displayed on the photographed image list is displayed. To the extent Maxell contends Nakashima does not disclose this limitation, a person of ordinary skill in the art would have readily arrived at this limitation by combining or modifying it in view of their general knowledge and/or the prior art references disclosed in the corresponding section of Samsung’s Invalidity Contentions.
[11pre] 11. The recording and reproducing apparatus according to claim 8,	Nakashima discloses “[t]he recording and reproducing apparatus according to claim 8.” See above.
[11a] wherein the memory further stores instructions that, when executed by the processor, cause the processor to: control the reproduction of the image information in a reproducing mode set from one of a first reproducing mode and a second reproducing mode,	Nakashima discloses “wherein the memory further stores instructions that, when executed by the processor, cause the processor to: control the reproduction of the image information in a reproducing mode set from one of a first reproducing mode and a second reproducing mode.” For example:

Nakashima at Fig. 4



Nakashima at Fig. 5

FIG.5

BASIC INFORMATION REGISTRATION TABLE

SUBJECT ID	NAME	REGISTERED FACIAL IMAGE
1	TARO FUJI	image001. jpg
2	HANAKO TAKAHASHI	image002. jpg
3	JIRO SUZUKI	image003. jpg
4	KAZUKO KATO	image004. jpg
5	SABURO YAMAMOTO	image005. jpg
⋮	⋮	⋮

75a

Nakashima at Fig. 6

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure																																																											
	FIG. 7 PHOTOGRAPH QUANTITY BY SUBJECT LIST TABLE <table><thead><tr><th>SUBJECT ID</th><th>NAME</th><th>PHOTOGRAPH TARGET</th><th>PHOTOGRAPH QUANTITY</th><th>MAIN SHOT QUANTITY</th></tr></thead><tbody><tr><td>1</td><td>TARO FUJI</td><td>ON</td><td>5</td><td>2</td></tr><tr><td>2</td><td>HANAKO TAKAHASHI</td><td>ON</td><td>3</td><td>1</td></tr><tr><td>3</td><td>JIRO SUZUKI</td><td>OFF</td><td>0</td><td>0</td></tr><tr><td>4</td><td>KAZUO KATO</td><td>ON</td><td>0</td><td>0</td></tr><tr><td>5</td><td>SABURO YAMAMOTO</td><td>ON</td><td>1</td><td>0</td></tr><tr><td>...</td><td>...</td><td>...</td><td>...</td><td>...</td></tr></tbody></table> 75c FIG. 6 PHOTOGRAPHED IMAGE LIST TABLE <table><thead><tr><th>IMAGE FILE NAME</th><th>SUBJECT ID</th><th>MAIN SUBJECT ID</th><th>FACE SIZE INAPPROPRIATE SUBJECT ID</th><th>EYES INAPPROPRIATE SUBJECT ID</th><th>EYES INAPPROPRIATE SUBJECT ID</th></tr></thead><tbody><tr><td>DSC00001.jpg</td><td>1, 2, 4, 5, 6</td><td>1</td><td>4</td><td>-</td><td>6</td></tr><tr><td>DSC00002.jpg</td><td>1, 2, 5, 6, 7, 8</td><td>2</td><td>5</td><td>7</td><td>6</td></tr><tr><td>...</td><td>...</td><td>...</td><td>...</td><td>...</td><td>...</td></tr></tbody></table> 75b Nakashima at Fig. 7	SUBJECT ID	NAME	PHOTOGRAPH TARGET	PHOTOGRAPH QUANTITY	MAIN SHOT QUANTITY	1	TARO FUJI	ON	5	2	2	HANAKO TAKAHASHI	ON	3	1	3	JIRO SUZUKI	OFF	0	0	4	KAZUO KATO	ON	0	0	5	SABURO YAMAMOTO	ON	1	0	...	...	...	...	...	IMAGE FILE NAME	SUBJECT ID	MAIN SUBJECT ID	FACE SIZE INAPPROPRIATE SUBJECT ID	EYES INAPPROPRIATE SUBJECT ID	EYES INAPPROPRIATE SUBJECT ID	DSC00001.jpg	1, 2, 4, 5, 6	1	4	-	6	DSC00002.jpg	1, 2, 5, 6, 7, 8	2	5	7	6	...	...	...	...	...	...
SUBJECT ID	NAME	PHOTOGRAPH TARGET	PHOTOGRAPH QUANTITY	MAIN SHOT QUANTITY																																																								
1	TARO FUJI	ON	5	2																																																								
2	HANAKO TAKAHASHI	ON	3	1																																																								
3	JIRO SUZUKI	OFF	0	0																																																								
4	KAZUO KATO	ON	0	0																																																								
5	SABURO YAMAMOTO	ON	1	0																																																								
...	...	...	...	...																																																								
IMAGE FILE NAME	SUBJECT ID	MAIN SUBJECT ID	FACE SIZE INAPPROPRIATE SUBJECT ID	EYES INAPPROPRIATE SUBJECT ID	EYES INAPPROPRIATE SUBJECT ID																																																							
DSC00001.jpg	1, 2, 4, 5, 6	1	4	-	6																																																							
DSC00002.jpg	1, 2, 5, 6, 7, 8	2	5	7	6																																																							
...	...	...	...	...	...																																																							

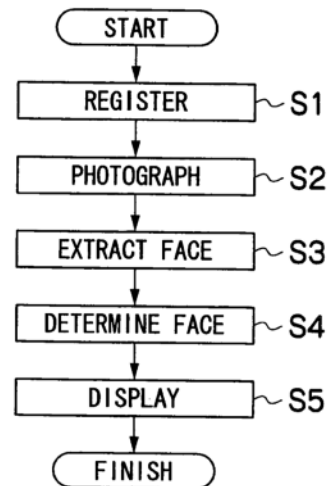
Nakashima at Fig. 8

FIG.8

FACE SIZE:		% OR OVER
EYES:		HALF-OPEN INVALID
LINE OF SIGHT:		ONLY STRAIGHT INTO CAMERA VALID
MAIN SHOT:		VALID
MINIMUM PHOTOGRAPH QUANTITY:		PHOTOGRAPHS
TARGET DATE AND TIME:		
FROM		
TO		
ESTIMATED FINISH:		
SET CANCEL		

Nakashima at Fig. 9

FIG.9



Nakashima at Fig. 10

FIG.10

FIG.10 is a menu screen with a rectangular border. Inside, there are four horizontal rectangular buttons stacked vertically. The top button contains the text "DISPLAY PHOTOGRAPH COUNT NUMBER LIST". The second button contains "SET VARIOUS CONDITIONS". The third button contains "RE-EXECUTE PHOTOGRAPH COUNT (REAFFIRM)". The bottom button contains "CANCEL".

Nakashima at Fig. 11

FIG.11

FIG.11 is a screen displaying a table with 5 columns: ID, NAME, TARGET, PHOTOGRAPH QUANTITY, and MAIN QUANTITY. The table contains 5 rows of data. Below the table are two buttons: "DISPLAY DETAILS" and "BACK".

ID	NAME	TARGET	PHOTOGRAPH QUANTITY	MAIN QUANTITY
4	KAZUKO KATO	ON	0	0
5	SABURO YAMAMOTO	ON	1	0
2	HANAKO TAKAHASHI	ON	3	1
1	TARO FUJI	ON	5	2
3	JIRO SUZUKI	OFF	0	0

Nakashima at Fig. 12

FIG.12

FACE DATA	SUBJECT ID:1 NAME: TARO FUJI PHOTOGRAPH COUNT: 5 MAIN SHOT QUANTITY: 2 PHOTOGRAPH TARGET: ON	
	<table border="0"><tr><td>DISPLAY PHOTOGRAPHED IMAGE LIST</td><td>BACK</td></tr></table>	DISPLAY PHOTOGRAPHED IMAGE LIST
DISPLAY PHOTOGRAPHED IMAGE LIST	BACK	

Nakashima at Fig. 13

FIG.13

MAIN SHOT:	MAIN SHOT 1	MAIN SHOT 2
OTHERS:		
OTHER 1	OTHER 2	
DELETE	BACK	

Nakashima at [0124]–[0130]

Referring now to FIG. 6, a photographed image list table 75b is stored in the hard disk 75. In this table, photographed images which are images obtained by fully pressing the release switch 104; subject IDs identified from the images by the face determination section 20d (in other words, identification information of the subjects shown in the image); main subject IDs which are the subject IDs of main subjects in the images; “face size inappropriate subject IDs” which are subject ID for subjects photographed at a size inappropriate for viewing or printing; “eyes inappropriate (half-open) subject IDs” which are subject IDs for subjects with eyes shut or half-open; and “line of sight inappropriate subject IDs” which are subject IDs for subjects whose lines of sight are inappropriate, are related to each other and stored.

Determination of which subject's subject ID should be stored in the photographed image list table as a “main subject ID”, a “face size inappropriate subject ID”, an “eyes inappropriate (half-open) subject ID” or a “line of sight inappropriate subject ID” may be either performed through software processing executed by the CPU 20, or through arbitrary operation of the operation section 120 by the user.

For instance, the face determination section 20 determines whether an extracted facial image detected by the face extraction section 20a is under a predefined size (for example, an absolute threshold such as 100 by 100 pixels, or a relative threshold such as the area ratio of the extracted image to the original image) (face size determination). If the extracted facial image is under the predefined size, a subject ID corresponding to a registered facial image matching a facial image of the facial region is related to the image as a “face size inappropriate subject ID”, and stored in the photographed image list table 75b.

Alternatively, the face determination section 20 stores a subject ID corresponding to a registered facial image matching a facial region in which the eyes are determined by the eyes open/shut detection section 20c to be shut and/or half-open as an eyes inappropriate (half-open) subject ID into the photographed image list table 75b.

In addition, the face determination section 20 displays a list of extracted facial images detected by the face extraction section 20a onto the image display LCD 102 to have the user select an extracted facial image where the line of sight is deviated, and stores a subject ID corresponding to a registered facial image matching the selected extracted facial image as a line of sight inappropriate subject ID into the photographed image list table 75b.

Alternatively, the face determination section 20 determines whether an extracted facial image is a main subject based on whether the extracted facial image was at a predefined position, such as the focus position of the AF detection section 150 or the vicinity of the center of the original image upon half-pressing of the release switch 104 (main subject determination). However, if there is only one extracted facial image, the extracted facial image is determined to be the main subject regardless of whether it is positioned at a predefined position. When an extracted facial image is determined to be the main subject,

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	a subject ID corresponding to a registered facial image matching the extracted facial image is stored in the photographed image list table 75b as a main subject ID. While the above-described face extraction section 20a, eye region detection section 20b, eye open/shut detection section 20c, face determination section 20d, subject management section 20e, and the display control section 20f are programs executed by the main CPU 20, a variation configured so that either a portion of or all of the above programs are implemented in a dedicated semiconductor integrated circuit (ASIC or Application Specific Integrated Circuit) is also possible. This variation is preferable, since it reduces the load on the main CPU 20. Nakashima at [0131]–[0133] Referring now to FIG. 7, a photograph quantity by subject list table 75c is stored in the hard disk 75. Among the images stored in the HDD 75, to all original images or desired original images specified via the operation section 120, the photograph quantity by subject list table 75c relates: “photograph quantities” which indicate the total number of original images containing an extracted facial image matching a registered facial image; “photograph targets” which are flags indicating whether an original image will be a target of face extraction by the face extraction section 20a; “main shot quantities” which are the total number of original images in which the extracted facial image is the main subject; and “subject IDs” and “names” corresponding to registered facial images matching the extracted facial images. Counting of the photograph quantity for each subject is performed by the subject management section 20e by individually adding up the number of extracted facial images, among those extracted from the original image by the face extraction section 20a, which match a certain registered facial image for each registered image. In addition, counting of the main shot quantity for each subject is performed by the subject management section 20e by individually adding up the number of extracted facial images positioned at the focus position of the AF detection section 150 or the vicinity of the center of the original image during photography for each registered image matching the extracted facial images. While a description will be provided later, the subject management section 20e may also be arranged to exclude original images which include extracted facial images corresponding to subject IDs stored as “face size inappropriate subject IDs”, “eyes inappropriate (half-open) subject IDs” or “line of sight inappropriate subject IDs” from the aggregate total of the photograph quantities. Nakashima at [0136]–[0143] FIG. 8 shows a condition setting screen which is an example of the GUI. Items settable by the condition setting screen are: a “face size” which is a relative area ratio threshold used for face size determination of

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	an extracted facial image to an original image; whether facial images with eyes half-open will be considered valid/invalid as extracted facial images; whether only extracted facial images with subjects looking straight into the camera will be calculated for photograph quantities and main shot quantities; whether only extracted facial images in which their subjects are main subjects will be calculated for main shot quantities; a “minimum photograph quantity” which is a prescribed photograph quantity; an original image range which the face extraction section 20a targets for extracting facial regions (in this example, “from (start)” and “to (end)” of time and date of photography; and an estimated time of finish of photography of a subject. The relationships between the setting items of the condition setting screen and the operation conditions of the programs are as follows. The face determination section 20d references an area ratio threshold set so as to correspond to a subject ID to determine whether the relative area ratio of a registered facial image corresponding to that subject ID to its original image exceeds the threshold. If not, the subject ID is stored as a “face size inappropriate subject ID”. Additionally, if “half-open invalid” is checked for a subject ID, in addition to an extracted facial image in which the eyes are completely shut, the eyes open/shut detection section 20c also stores an extracted facial image in which the eyes are neither completely shut nor completely open (so-called half-open) as an “eyes inappropriate (half-open) subject ID”. Moreover, the subject management section 20e calculates an aggregate total of “main shot IDs” only when “main shot” is checked for a subject ID. If a “minimum photography quantity” of 1 or above is set for a subject ID, the subject management section 20e references the “photograph quantity” corresponding to that subject ID at a predefined timing (for instance, the time set as “estimated finish”, or after a lapse of a predefined time, such as 15 minutes, after setting to photography mode). If the “photograph quantity” is under the “minimum photography quantity”, a predefined warning is displayed on the liquid crystal 71. Alternatively, a warning message indicating the name of a subject for which the “photograph quantity” is under the “minimum photography quantity” may be played back through a speaker, not shown. This allows the photographer to easily acknowledge which subject's photograph quantity has not reached a prescribed quantity without having to go through the trouble of visually confirming the photograph quantity. Furthermore, if “from” and “to” have been set, the face extraction section 20a performs face extraction only on original images with image recording dates/times recorded in datetimeoriginal tags or the like which are within the range defined by “from” and “to”. This allows a photographer to arbitrarily specify at what timing images should be photographed to become targets of facial extraction, and is therefore preferable.

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	These setting items are individually settable for each subject ID, and set items are only valid for registered facial images corresponding to each subject ID. Conditions set with this screen are related to subject IDs and stored in the EEPROM 146 or the like, and will become the conditions to which the main CPU 20 conforms when executing the various programs. Nakashima at [0151] On the other hand, the “photograph quantity” of the photograph quantity by subject list table 75c, which is the total number of photographed images for which subject IDs were identified by the facial determination section 20d, is updated for each subject ID. In other words, whenever photography is performed, the total number of each subject appearing in the images photographed thus far is stored into the photograph quantity by subject list table 75c. Nakashima at [0156]–[0158] FIG. 10 shows an example of a camera mode selection screen. In this camera mode selection screen, buttons for specifying four types of operations, namely “display photograph count list”, “set various conditions”, “re-execute photograph count” and “cancel”, are displayed. Each menu may be selected/specified using the cross-shape key 124 or the like in the operation section to execute operations corresponding to each selected mode. “Re-execute photograph count” is a button used to give the re-execution instruction of step S4. The processing of step S4 is executed upon operation of this button. When “display photograph count list” is selected, the display control section 20f displays information stored in the photograph quantity by subject list table 75c on the liquid crystal panel 71. Nakashima at [0159] FIG. 11 is an example of a list display of the contents of the photograph quantity by subject list table 75c. As shown in FIG. 11, list information composed of a subject ID, name, photograph target flag, photograph quantity, and number of main subjects related to each other in the photograph quantity by subject list table 75c is displayed in list format on the liquid crystal panel 71. At this point, the list information may be displayed after sorting in ascending/descending order of photograph quantity per subject. This allows a photographer to easily acknowledge which subject has had fewer or more photographs taken than others, and is useful in preventing or correcting occurrences of biases among the photograph quantity to be subsequently taken for the subjects.

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	Nakashima at [0161] FIG. 12 shows a display example of individual information. For instance, in addition to specified list information (subject ID, name, photograph quantity, main shot quantity, photograph target flag), a registered facial image is displayed on this screen. A photographer may reference this screen and confirm which subject has had fewer or more photographs taken than others while looking at the faces or names of the subjects. Nakashima at [0163] A “photographed image list display” button is provided on this screen. When the “photographed image list display” button is selected, the display control section 20f displays a list of photographed images corresponding to the subject ID of the specified list information. Nakashima at [0165]–[0167] FIG. 13 shows a list display example of photographed images. In the particular example shown in FIG. 13, the display control section 20f displays photographed images which correspond to a subject ID stored in the photographed image list table 75b as a “main subject ID” among the subject IDs of the specified list information as “main shots”, and displays such “main shots” to be distinguishable from other photographed images. This allows photographed images showing the specified desired subject as a main subject to be displayed separately from the other photographed images, and enables a photographer to grasp at a glance which subject is featured as a main subject in which photographed image. Photographed images may be deleted and organized on this screen. In other words, by selecting a desired photographed image and operating a “delete” button at the top of the screen, the selected photographed image is deleted from the HDD 75 or the like. When “setting various conditions” is selected on the camera mode selection screen, a condition setting screen (refer to FIG. 8) for setting determination of eyes shut/half-open, determination of face size, and various other conditions for narrowing down the images to be displayed on the photographed image list is displayed. To the extent Maxell contends Nakashima does not disclose this limitation, a person of ordinary skill in the art would have readily arrived at this limitation by combining or modifying it in view of their general knowledge and/or the prior art references disclosed in the corresponding section of Samsung’s Invalidity Contentions.

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[11b] wherein a reproducing time required for reproducing the image information under the first reproducing mode is shorter than a reproducing time required for reproducing the image information under the second reproducing mode, and

Nakashima Exemplary Disclosure

Nakashima discloses “wherein a reproducing time required for reproducing the image information under the first reproducing mode is shorter than a reproducing time required for reproducing the image information under the second reproducing mode.” For example:

Nakashima at Fig. 6

FIG 6

PHOTOGRAPHED IMAGE LIST TABLE

IMAGE FILE NAME	SUBJECT ID	MAIN SUBJECT ID	FACE SIZE ID	IMPROPRIATE SUBJECT ID	EYES (HAF-OPEN) SUBJECT ID	EYES IMPROPRIATE SUBJECT ID
D0000001.JPG	1, 2, 4, 5, 6	1	4	-	-	6
D0000002.JPG	1, 2, 3, 6, 7, 8	2	5	7	-	6
...	...	...	...	...	...	...

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Nakashima at Fig. 7

FIG.7

PHOTOGRAPH QUANTITY BY SUBJECT LIST TABLE				
SUBJECT ID	NAME	PHOTOGRAPH TARGET	PHOTOGRAPH QUANTITY	MAIN SHOT QUANTITY
1	TARO FUJI	ON	5	2
2	HANAKO TAKAHASHI	ON	3	1
3	JIRO SUZUKI	OFF	0	0
4	KAZUO KATO	ON	0	0
5	SAEKO YAMAMOTO	ON	1	0
...	...	...	...	...

Nakashima at Fig. 8

FIG.8

FACE SIZE:

% OR OVER

EYES:

HALF-OPEN INVALID

LINE OF SIGHT:

ONLY STRAIGHT INTO CAMERA VALID

MAIN SHOT:

VALID

MINIMUM PHOTOGRAPH QUANTITY:

PHOTOGRAPHS

TARGET DATE AND TIME:

FROM

TO

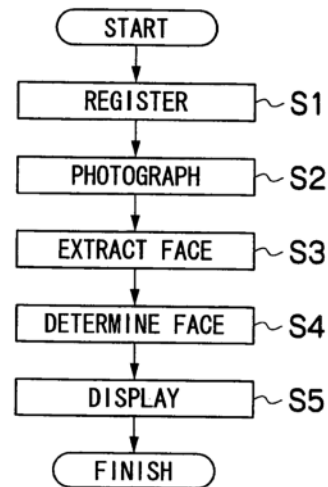
ESTIMATED FINISH:

SET

CANCEL

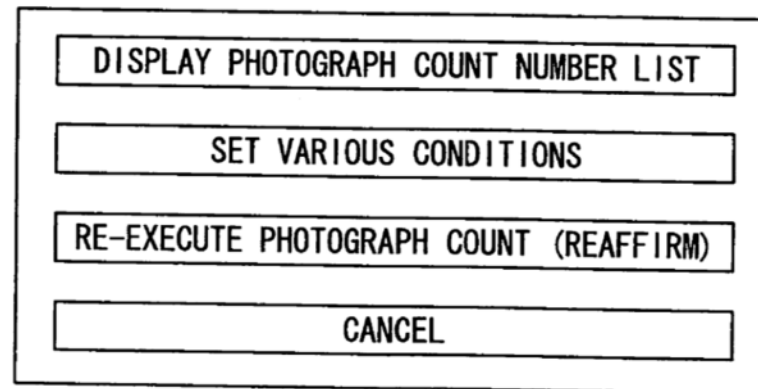
Nakashima at Fig. 9

FIG.9



Nakashima at Fig. 10

FIG.10



Nakashima at Fig. 11

FIG.11

ID	NAME	TARGET	PHOTOGRAPH QUANTITY	MAIN QUANTITY
4	KAZUKO KATO	ON	0	0
5	SABURO YAMAMOTO	ON	1	0
2	HANAKO TAKAHASHI	ON	3	1
1	TARO FUJI	ON	5	2
3	JIRO SUZUKI	OFF	0	0

DISPLAY DETAILS

BACK

Nakashima at Fig. 12

FIG.12

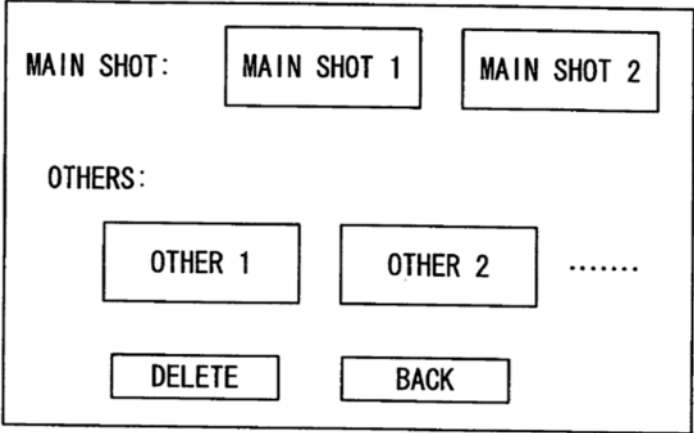
FACE DATA

SUBJECT ID:1
NAME: TARO FUJI
PHOTOGRAPH COUNT: 5
MAIN SHOT QUANTITY: 2
PHOTOGRAPH TARGET: ON

DISPLAY PHOTOGRAPHED
IMAGE LIST

BACK

Nakashima at Fig. 13

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	FIG.13  Nakashima at [0124]–[0130] Referring now to FIG. 6, a photographed image list table 75b is stored in the hard disk 75. In this table, photographed images which are images obtained by fully pressing the release switch 104; subject IDs identified from the images by the face determination section 20d (in other words, identification information of the subjects shown in the image); main subject IDs which are the subject IDs of main subjects in the images; “face size inappropriate subject IDs” which are subject ID for subjects photographed at a size inappropriate for viewing or printing; “eyes inappropriate (half-open) subject IDs” which are subject IDs for subjects with eyes shut or half-open; and “line of sight inappropriate subject IDs” which are subject IDs for subjects whose lines of sight are inappropriate, are related to each other and stored. Determination of which subject's subject ID should be stored in the photographed image list table as a “main subject ID”, a “face size inappropriate subject ID”, an “eyes inappropriate (half-open) subject ID” or a “line of sight inappropriate subject ID” may be either performed through software processing executed by the CPU 20, or through arbitrary operation of the operation section 120 by the user. For instance, the face determination section 20 determines whether an extracted facial image detected by the face extraction section 20a is under a predefined size (for example, an absolute threshold such as 100 by 100 pixels, or a relative threshold such as the area ratio of the extracted image to the original image)

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	(face size determination). If the extracted facial image is under the predefined size, a subject ID corresponding to a registered facial image matching a facial image of the facial region is related to the image as a “face size inappropriate subject ID”, and stored in the photographed image list table 75b. Alternatively, the face determination section 20 stores a subject ID corresponding to a registered facial image matching a facial region in which the eyes are determined by the eyes open/shut detection section 20c to be shut and/or half-open as an eyes inappropriate (half-open) subject ID into the photographed image list table 75b. In addition, the face determination section 20 displays a list of extracted facial images detected by the face extraction section 20a onto the image display LCD 102 to have the user select an extracted facial image where the line of sight is deviated, and stores a subject ID corresponding to a registered facial image matching the selected extracted facial image as a line of sight inappropriate subject ID into the photographed image list table 75b. Alternatively, the face determination section 20 determines whether an extracted facial image is a main subject based on whether the extracted facial image was at a predefined position, such as the focus position of the AF detection section 150 or the vicinity of the center of the original image upon half-pressing of the release switch 104 (main subject determination). However, if there is only one extracted facial image, the extracted facial image is determined to be the main subject regardless of whether it is positioned at a predefined position. When an extracted facial image is determined to be the main subject, a subject ID corresponding to a registered facial image matching the extracted facial image is stored in the photographed image list table 75b as a main subject ID. While the above-described face extraction section 20a, eye region detection section 20b, eye open/shut detection section 20c, face determination section 20d, subject management section 20e, and the display control section 20f are programs executed by the main CPU 20, a variation configured so that either a portion of or all of the above programs are implemented in a dedicated semiconductor integrated circuit (ASIC or Application Specific Integrated Circuit) is also possible. This variation is preferable, since it reduces the load on the main CPU 20. Nakashima at [0131]–[0133] Referring now to FIG. 7, a photograph quantity by subject list table 75c is stored in the hard disk 75. Among the images stored in the HDD 75, to all original images or desired original images specified via the operation section 120, the photograph quantity by subject list table 75c relates: “photograph quantities” which indicate the total number of original images containing an extracted facial image matching a registered facial image; “photograph targets” which are flags indicating whether an original image will be a target of face extraction by the face extraction section 20a; “main shot quantities” which

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	are the total number of original images in which the extracted facial image is the main subject; and “subject IDs” and “names” corresponding to registered facial images matching the extracted facial images. Counting of the photograph quantity for each subject is performed by the subject management section 20e by individually adding up the number of extracted facial images, among those extracted from the original image by the face extraction section 20a, which match a certain registered facial image for each registered image. In addition, counting of the main shot quantity for each subject is performed by the subject management section 20e by individually adding up the number of extracted facial images positioned at the focus position of the AF detection section 150 or the vicinity of the center of the original image during photography for each registered image matching the extracted facial images. While a description will be provided later, the subject management section 20e may also be arranged to exclude original images which include extracted facial images corresponding to subject IDs stored as “face size inappropriate subject IDs”, “eyes inappropriate (half-open) subject IDs” or “line of sight inappropriate subject IDs” from the aggregate total of the photograph quantities. Nakashima at [0136]–[0143] FIG. 8 shows a condition setting screen which is an example of the GUI. Items settable by the condition setting screen are: a “face size” which is a relative area ratio threshold used for face size determination of an extracted facial image to an original image; whether facial images with eyes half-open will be considered valid/invalid as extracted facial images; whether only extracted facial images with subjects looking straight into the camera will be calculated for photograph quantities and main shot quantities; whether only extracted facial images in which their subjects are main subjects will be calculated for main shot quantities; a “minimum photograph quantity” which is a prescribed photograph quantity; an original image range which the face extraction section 20a targets for extracting facial regions (in this example, “from (start)” and “to (end)” of time and date of photography; and an estimated time of finish of photography of a subject. The relationships between the setting items of the condition setting screen and the operation conditions of the programs are as follows. The face determination section 20d references an area ratio threshold set so as to correspond to a subject ID to determine whether the relative area ratio of a registered facial image corresponding to that subject ID to its original image exceeds the threshold. If not, the subject ID is stored as a “face size inappropriate subject ID”. Additionally, if “half-open invalid” is checked for a subject ID, in addition to an extracted facial image in which the eyes are completely shut, the eyes open/shut detection section 20c also stores an extracted

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	facial image in which the eyes are neither completely shut nor completely open (so-called half-open) as an “eyes inappropriate (half-open) subject ID”. Moreover, the subject management section 20e calculates an aggregate total of “main shot IDs” only when “main shot” is checked for a subject ID. If a “minimum photography quantity” of 1 or above is set for a subject ID, the subject management section 20e references the “photograph quantity” corresponding to that subject ID at a predefined timing (for instance, the time set as “estimated finish”, or after a lapse of a predefined time, such as 15 minutes, after setting to photography mode). If the “photograph quantity” is under the “minimum photography quantity”, a predefined warning is displayed on the liquid crystal 71. Alternatively, a warning message indicating the name of a subject for which the “photograph quantity” is under the “minimum photography quantity” may be played back through a speaker, not shown. This allows the photographer to easily acknowledge which subject's photograph quantity has not reached a prescribed quantity without having to go through the trouble of visually confirming the photograph quantity. Furthermore, if “from” and “to” have been set, the face extraction section 20a performs face extraction only on original images with image recording dates/times recorded in datetimeoriginal tags or the like which are within the range defined by “from” and “to”. This allows a photographer to arbitrarily specify at what timing images should be photographed to become targets of facial extraction, and is therefore preferable. These setting items are individually settable for each subject ID, and set items are only valid for registered facial images corresponding to each subject ID. Conditions set with this screen are related to subject IDs and stored in the EEPROM 146 or the like, and will become the conditions to which the main CPU 20 conforms when executing the various programs. Nakashima at [0156]–[0158] FIG. 10 shows an example of a camera mode selection screen. In this camera mode selection screen, buttons for specifying four types of operations, namely “display photograph count list”, “set various conditions”, “re-execute photograph count” and “cancel”, are displayed. Each menu may be selected/specified using the cross-shape key 124 or the like in the operation section to execute operations corresponding to each selected mode. “Re-execute photograph count” is a button used to give the re-execution instruction of step S4. The processing of step S4 is executed upon operation of this button. When “display photograph count list” is selected, the display control section 20f displays information stored in the photograph quantity by subject list table 75c on the liquid crystal panel 71.

Nakashima at [0159]

FIG. 11 is an example of a list display of the contents of the photograph quantity by subject list table 75c. As shown in FIG. 11, list information composed of a subject ID, name, photograph target flag, photograph quantity, and number of main subjects related to each other in the photograph quantity by subject list table 75c is displayed in list format on the liquid crystal panel 71. At this point, the list information may be displayed after sorting in ascending/descending order of photograph quantity per subject. This allows a photographer to easily acknowledge which subject has had fewer or more photographs taken than others, and is useful in preventing or correcting occurrences of biases among the photograph quantity to be subsequently taken for the subjects.

Nakashima at [0161]

FIG. 12 shows a display example of individual information. For instance, in addition to specified list information (subject ID, name, photograph quantity, main shot quantity, photograph target flag), a registered facial image is displayed on this screen. A photographer may reference this screen and confirm which subject has had fewer or more photographs taken than others while looking at the faces or names of the subjects.

Nakashima at [0163]

A “photographed image list display” button is provided on this screen. When the “photographed image list display” button is selected, the display control section 20f displays a list of photographed images corresponding to the subject ID of the specified list information.

Nakashima at [0165]–[0167]

FIG. 13 shows a list display example of photographed images. In the particular example shown in FIG. 13, the display control section 20f displays photographed images which correspond to a subject ID stored in the photographed image list table 75b as a “main subject ID” among the subject IDs of the specified list information as “main shots”, and displays such “main shots” to be distinguishable from other photographed images. This allows photographed images showing the specified desired subject as a main subject to be displayed separately from the other photographed images, and enables a photographer to grasp at a glance which subject is featured as a main subject in which photographed image.

Photographed images may be deleted and organized on this screen. In other words, by selecting a desired photographed image and operating a “delete” button at the top of the screen, the selected photographed image is deleted from the HDD 75 or the like.

When “setting various conditions” is selected on the camera mode selection screen, a condition setting screen (refer to FIG. 8) for setting determination of eyes shut/half-open, determination of face size, and

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure																												
	various other conditions for narrowing down the images to be displayed on the photographed image list is displayed. To the extent Maxell contends Nakashima does not disclose this limitation, a person of ordinary skill in the art would have readily arrived at this limitation by combining or modifying it in view of their general knowledge and/or the prior art references disclosed in the corresponding section of Samsung’s Invalidity Contentions.																												
[11c] the image information reproduced under the second mode includes the image information reproduced under the first reproducing mode and other of the image information not reproduced under the first reproducing mode.	Nakashima discloses “the image information reproduced under the second mode includes the image information reproduced under the first reproducing mode and other of the image information not reproduced under the first reproducing mode.” For example: Nakashima at Fig. 6 FIG.6 PHOTOGRAPHED IMAGE LIST TABLE <table><tr><th>IMAGE FILE NAME</th><th>SUBJECT ID</th><th>MAIN SUBJECT ID</th><th>FACE SIZE</th><th>INAPPROPRIATE SUBJECT ID</th><th>EYES INAPPROPRIATE SUBJECT ID</th><th>EYES INAPPROPRIATE SUBJECT ID</th></tr><tr><td>DSC00001_1.jpg</td><td>1, 2, 4, 5, 6</td><td>1</td><td>4</td><td>4</td><td>6</td><td>6</td></tr><tr><td>DSC00002_2.jpg</td><td>1, 2, 5, 6, 7, 8</td><td>2</td><td>5</td><td>5</td><td>7</td><td>7</td></tr><tr><td>...</td><td>...</td><td>...</td><td>...</td><td>...</td><td>...</td><td>...</td></tr></table>	IMAGE FILE NAME	SUBJECT ID	MAIN SUBJECT ID	FACE SIZE	INAPPROPRIATE SUBJECT ID	EYES INAPPROPRIATE SUBJECT ID	EYES INAPPROPRIATE SUBJECT ID	DSC00001_1.jpg	1, 2, 4, 5, 6	1	4	4	6	6	DSC00002_2.jpg	1, 2, 5, 6, 7, 8	2	5	5	7	7	...	...	...	...	...	...	...
IMAGE FILE NAME	SUBJECT ID	MAIN SUBJECT ID	FACE SIZE	INAPPROPRIATE SUBJECT ID	EYES INAPPROPRIATE SUBJECT ID	EYES INAPPROPRIATE SUBJECT ID																							
DSC00001_1.jpg	1, 2, 4, 5, 6	1	4	4	6	6																							
DSC00002_2.jpg	1, 2, 5, 6, 7, 8	2	5	5	7	7																							
...	...	...	...	...	...	...																							

Nakashima at Fig. 7

FIG.7

PHOTOGRAPH QUANTITY BY SUBJECT LIST TABLE				
SUBJECT ID	NAME	PHOTOGRAPH TARGET	PHOTOGRAPH QUANTITY	MAIN SHOT QUANTITY
1	TARO FUJI	ON	5	2
2	HANAKO TAKAHASHI	ON	3	1
3	JIRO SUZUKI	OFF	0	0
4	KAZUO KATO	ON	0	0
5	SAEKO YAMAMOTO	ON	1	0
...	...	...	...	...

Nakashima at Fig. 8

FIG.8

FACE SIZE:

% OR OVER

EYES:

HALF-OPEN INVALID

LINE OF SIGHT:

ONLY STRAIGHT INTO CAMERA VALID

MAIN SHOT:

VALID

MINIMUM PHOTOGRAPH QUANTITY:

PHOTOGRAPHS

TARGET DATE AND TIME:

FROM

TO

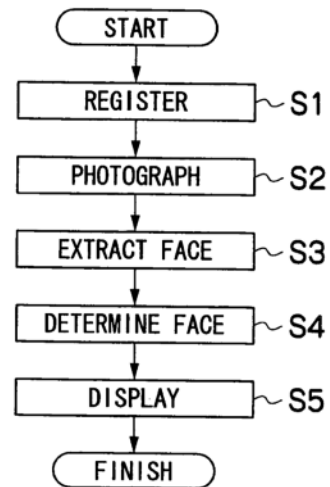
ESTIMATED FINISH:

SET

CANCEL

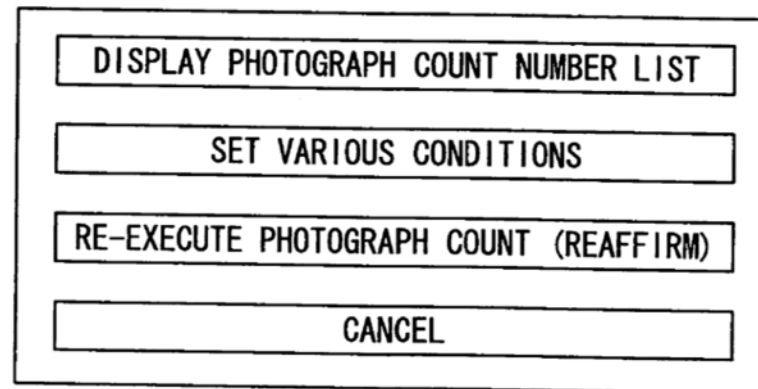
Nakashima at Fig. 9

FIG.9



Nakashima at Fig. 10

FIG.10



Nakashima at Fig. 11

FIG.11

ID	NAME	TARGET	PHOTOGRAPH QUANTITY	MAIN QUANTITY
4	KAZUKO KATO	ON	0	0
5	SABURO YAMAMOTO	ON	1	0
2	HANAKO TAKAHASHI	ON	3	1
1	TARO FUJI	ON	5	2
3	JIRO SUZUKI	OFF	0	0

DISPLAY DETAILS

BACK

Nakashima at Fig. 12

FIG.12

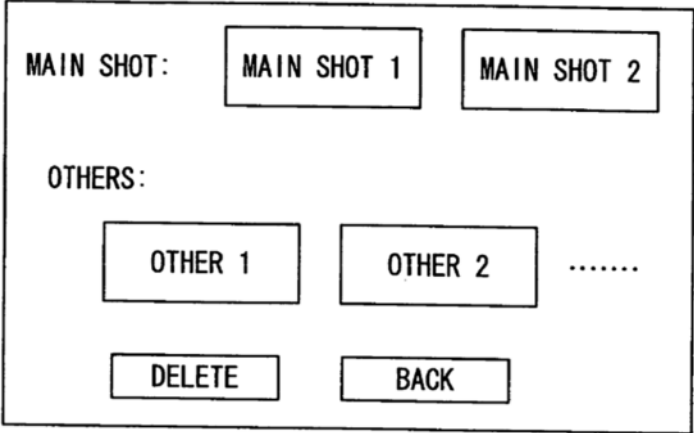
FACE DATA

SUBJECT ID:1
NAME: TARO FUJI
PHOTOGRAPH COUNT: 5
MAIN SHOT QUANTITY: 2
PHOTOGRAPH TARGET: ON

DISPLAY PHOTOGRAPHED
IMAGE LIST

BACK

Nakashima at Fig. 13

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	FIG.13  Nakashima at [0124]–[0130] Referring now to FIG. 6, a photographed image list table 75b is stored in the hard disk 75. In this table, photographed images which are images obtained by fully pressing the release switch 104; subject IDs identified from the images by the face determination section 20d (in other words, identification information of the subjects shown in the image); main subject IDs which are the subject IDs of main subjects in the images; “face size inappropriate subject IDs” which are subject ID for subjects photographed at a size inappropriate for viewing or printing; “eyes inappropriate (half-open) subject IDs” which are subject IDs for subjects with eyes shut or half-open; and “line of sight inappropriate subject IDs” which are subject IDs for subjects whose lines of sight are inappropriate, are related to each other and stored. Determination of which subject's subject ID should be stored in the photographed image list table as a “main subject ID”, a “face size inappropriate subject ID”, an “eyes inappropriate (half-open) subject ID” or a “line of sight inappropriate subject ID” may be either performed through software processing executed by the CPU 20, or through arbitrary operation of the operation section 120 by the user. For instance, the face determination section 20 determines whether an extracted facial image detected by the face extraction section 20a is under a predefined size (for example, an absolute threshold such as 100 by 100 pixels, or a relative threshold such as the area ratio of the extracted image to the original image)

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	(face size determination). If the extracted facial image is under the predefined size, a subject ID corresponding to a registered facial image matching a facial image of the facial region is related to the image as a “face size inappropriate subject ID”, and stored in the photographed image list table 75b. Alternatively, the face determination section 20 stores a subject ID corresponding to a registered facial image matching a facial region in which the eyes are determined by the eyes open/shut detection section 20c to be shut and/or half-open as an eyes inappropriate (half-open) subject ID into the photographed image list table 75b. In addition, the face determination section 20 displays a list of extracted facial images detected by the face extraction section 20a onto the image display LCD 102 to have the user select an extracted facial image where the line of sight is deviated, and stores a subject ID corresponding to a registered facial image matching the selected extracted facial image as a line of sight inappropriate subject ID into the photographed image list table 75b. Alternatively, the face determination section 20 determines whether an extracted facial image is a main subject based on whether the extracted facial image was at a predefined position, such as the focus position of the AF detection section 150 or the vicinity of the center of the original image upon half-pressing of the release switch 104 (main subject determination). However, if there is only one extracted facial image, the extracted facial image is determined to be the main subject regardless of whether it is positioned at a predefined position. When an extracted facial image is determined to be the main subject, a subject ID corresponding to a registered facial image matching the extracted facial image is stored in the photographed image list table 75b as a main subject ID. While the above-described face extraction section 20a, eye region detection section 20b, eye open/shut detection section 20c, face determination section 20d, subject management section 20e, and the display control section 20f are programs executed by the main CPU 20, a variation configured so that either a portion of or all of the above programs are implemented in a dedicated semiconductor integrated circuit (ASIC or Application Specific Integrated Circuit) is also possible. This variation is preferable, since it reduces the load on the main CPU 20. Nakashima at [0131]–[0133] Referring now to FIG. 7, a photograph quantity by subject list table 75c is stored in the hard disk 75. Among the images stored in the HDD 75, to all original images or desired original images specified via the operation section 120, the photograph quantity by subject list table 75c relates: “photograph quantities” which indicate the total number of original images containing an extracted facial image matching a registered facial image; “photograph targets” which are flags indicating whether an original image will be a target of face extraction by the face extraction section 20a; “main shot quantities” which

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	are the total number of original images in which the extracted facial image is the main subject; and “subject IDs” and “names” corresponding to registered facial images matching the extracted facial images. Counting of the photograph quantity for each subject is performed by the subject management section 20e by individually adding up the number of extracted facial images, among those extracted from the original image by the face extraction section 20a, which match a certain registered facial image for each registered image. In addition, counting of the main shot quantity for each subject is performed by the subject management section 20e by individually adding up the number of extracted facial images positioned at the focus position of the AF detection section 150 or the vicinity of the center of the original image during photography for each registered image matching the extracted facial images. While a description will be provided later, the subject management section 20e may also be arranged to exclude original images which include extracted facial images corresponding to subject IDs stored as “face size inappropriate subject IDs”, “eyes inappropriate (half-open) subject IDs” or “line of sight inappropriate subject IDs” from the aggregate total of the photograph quantities. Nakashima at [0136]–[0143] FIG. 8 shows a condition setting screen which is an example of the GUI. Items settable by the condition setting screen are: a “face size” which is a relative area ratio threshold used for face size determination of an extracted facial image to an original image; whether facial images with eyes half-open will be considered valid/invalid as extracted facial images; whether only extracted facial images with subjects looking straight into the camera will be calculated for photograph quantities and main shot quantities; whether only extracted facial images in which their subjects are main subjects will be calculated for main shot quantities; a “minimum photograph quantity” which is a prescribed photograph quantity; an original image range which the face extraction section 20a targets for extracting facial regions (in this example, “from (start)” and “to (end)” of time and date of photography; and an estimated time of finish of photography of a subject. The relationships between the setting items of the condition setting screen and the operation conditions of the programs are as follows. The face determination section 20d references an area ratio threshold set so as to correspond to a subject ID to determine whether the relative area ratio of a registered facial image corresponding to that subject ID to its original image exceeds the threshold. If not, the subject ID is stored as a “face size inappropriate subject ID”. Additionally, if “half-open invalid” is checked for a subject ID, in addition to an extracted facial image in which the eyes are completely shut, the eyes open/shut detection section 20c also stores an extracted

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	facial image in which the eyes are neither completely shut nor completely open (so-called half-open) as an “eyes inappropriate (half-open) subject ID”. Moreover, the subject management section 20e calculates an aggregate total of “main shot IDs” only when “main shot” is checked for a subject ID. If a “minimum photography quantity” of 1 or above is set for a subject ID, the subject management section 20e references the “photograph quantity” corresponding to that subject ID at a predefined timing (for instance, the time set as “estimated finish”, or after a lapse of a predefined time, such as 15 minutes, after setting to photography mode). If the “photograph quantity” is under the “minimum photography quantity”, a predefined warning is displayed on the liquid crystal 71. Alternatively, a warning message indicating the name of a subject for which the “photograph quantity” is under the “minimum photography quantity” may be played back through a speaker, not shown. This allows the photographer to easily acknowledge which subject's photograph quantity has not reached a prescribed quantity without having to go through the trouble of visually confirming the photograph quantity. Furthermore, if “from” and “to” have been set, the face extraction section 20a performs face extraction only on original images with image recording dates/times recorded in datetimeoriginal tags or the like which are within the range defined by “from” and “to”. This allows a photographer to arbitrarily specify at what timing images should be photographed to become targets of facial extraction, and is therefore preferable. These setting items are individually settable for each subject ID, and set items are only valid for registered facial images corresponding to each subject ID. Conditions set with this screen are related to subject IDs and stored in the EEPROM 146 or the like, and will become the conditions to which the main CPU 20 conforms when executing the various programs. Nakashima at [0156]–[0158] FIG. 10 shows an example of a camera mode selection screen. In this camera mode selection screen, buttons for specifying four types of operations, namely “display photograph count list”, “set various conditions”, “re-execute photograph count” and “cancel”, are displayed. Each menu may be selected/specified using the cross-shape key 124 or the like in the operation section to execute operations corresponding to each selected mode. “Re-execute photograph count” is a button used to give the re-execution instruction of step S4. The processing of step S4 is executed upon operation of this button. When “display photograph count list” is selected, the display control section 20f displays information stored in the photograph quantity by subject list table 75c on the liquid crystal panel 71.

Nakashima at [0159]

FIG. 11 is an example of a list display of the contents of the photograph quantity by subject list table 75c. As shown in FIG. 11, list information composed of a subject ID, name, photograph target flag, photograph quantity, and number of main subjects related to each other in the photograph quantity by subject list table 75c is displayed in list format on the liquid crystal panel 71. At this point, the list information may be displayed after sorting in ascending/descending order of photograph quantity per subject. This allows a photographer to easily acknowledge which subject has had fewer or more photographs taken than others, and is useful in preventing or correcting occurrences of biases among the photograph quantity to be subsequently taken for the subjects.

Nakashima at [0161]

FIG. 12 shows a display example of individual information. For instance, in addition to specified list information (subject ID, name, photograph quantity, main shot quantity, photograph target flag), a registered facial image is displayed on this screen. A photographer may reference this screen and confirm which subject has had fewer or more photographs taken than others while looking at the faces or names of the subjects.

Nakashima at [0163]

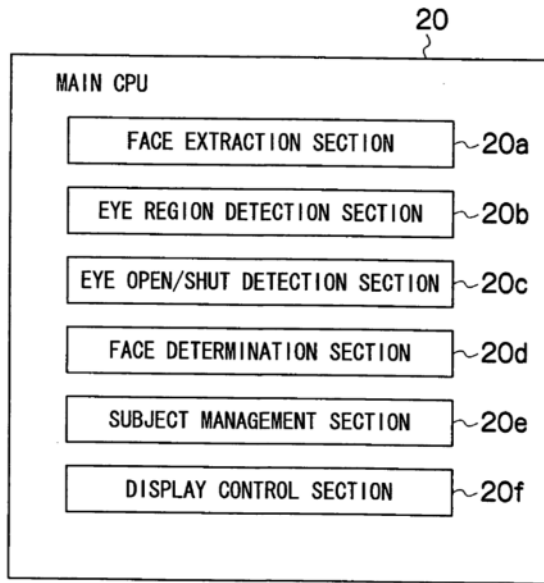
A “photographed image list display” button is provided on this screen. When the “photographed image list display” button is selected, the display control section 20f displays a list of photographed images corresponding to the subject ID of the specified list information.

Nakashima at [0165]–[0167]

FIG. 13 shows a list display example of photographed images. In the particular example shown in FIG. 13, the display control section 20f displays photographed images which correspond to a subject ID stored in the photographed image list table 75b as a “main subject ID” among the subject IDs of the specified list information as “main shots”, and displays such “main shots” to be distinguishable from other photographed images. This allows photographed images showing the specified desired subject as a main subject to be displayed separately from the other photographed images, and enables a photographer to grasp at a glance which subject is featured as a main subject in which photographed image.

Photographed images may be deleted and organized on this screen. In other words, by selecting a desired photographed image and operating a “delete” button at the top of the screen, the selected photographed image is deleted from the HDD 75 or the like.

When “setting various conditions” is selected on the camera mode selection screen, a condition setting screen (refer to FIG. 8) for setting determination of eyes shut/half-open, determination of face size, and

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	various other conditions for narrowing down the images to be displayed on the photographed image list is displayed. To the extent Maxell contends Nakashima does not disclose this limitation, a person of ordinary skill in the art would have readily arrived at this limitation by combining or modifying it in view of their general knowledge and/or the prior art references disclosed in the corresponding section of Samsung's Invalidity Contentions.
[12pre] 12. The recording and reproducing apparatus according to claim 11,	Nakashima discloses "[t]he recording and reproducing apparatus according to claim 11." See above.
[12a] wherein the memory further stores instructions that, when executed by the processor, cause the processor to: control the reproduction of the image information in the reproducing mode set from one of the first reproducing mode, the second reproducing mode, and a third reproducing mode,	Nakashima discloses "wherein the memory further stores instructions that, when executed by the processor, cause the processor to: control the reproduction of the image information in the reproducing mode set from one of the first reproducing mode, the second reproducing mode, and a third reproducing mode." For example: Nakashima at Fig. 4  <pre> graph TD 20[20] --- CPU[MAIN CPU] CPU --- 20a[FACE EXTRACTION SECTION 20a] CPU --- 20b[EYE REGION DETECTION SECTION 20b] CPU --- 20c[EYE OPEN/SHUT DETECTION SECTION 20c] CPU --- 20d[FACE DETERMINATION SECTION 20d] CPU --- 20e[SUBJECT MANAGEMENT SECTION 20e] CPU --- 20f[DISPLAY CONTROL SECTION 20f] </pre>

Nakashima at Fig. 5

FIG.5

BASIC INFORMATION REGISTRATION TABLE

SUBJECT ID	NAME	REGISTERED FACIAL IMAGE
1	TARO FUJI	image001. jpg
2	HANAKO TAKAHASHI	image002. jpg
3	JIRO SUZUKI	image003. jpg
4	KAZUKO KATO	image004. jpg
5	SABURO YAMAMOTO	image005. jpg
⋮	⋮	⋮

~75a

Nakashima at Fig. 6

FIG.6

PHOTOGRAPHED IMAGE LIST TABLE					
IMAGE FILE NAME	SUBJECT ID	MAIN SUBJECT ID	FACE SIZE INAPPROPRIATE SUBJECT ID	EYES INAPPROPRIATE (HALF-OPEN) SUBJECT ID	EYES INAPPROPRIATE SUBJECT ID
DS000001. jpg	1, 2, 4, 5, 6	1	4	-	6
DS000002. jpg	1, 2, 3, 5, 7, 8	2	5	7	6
⋮	⋮	⋮	⋮	⋮	⋮

~75b

Nakashima at Fig. 7

FIG.7

PHOTOGRAPH QUANTITY BY SUBJECT LIST TABLE

SUBJECT ID	NAME	PHOTOGRAPH TARGET	PHOTOGRAPH QUANTITY	MAIN SHOT QUANTITY
1	TARO FUJI	ON	5	2
2	HANAKO TAKAHASHI	ON	3	1
3	JIRO SUZUKI	OFF	0	0
4	KAZUKO KATO	ON	0	0
5	SHIGURO YAMAMOTO	ON	1	0
....				

~75c

Nakashima at Fig. 8

FIG.8

FACE SIZE:

% OR OVER

EYES:

HALF-OPEN INVALID

LINE OF SIGHT:

ONLY STRAIGHT INTO CAMERA VALID

MAIN SHOT:

VALID

MINIMUM PHOTOGRAPH QUANTITY:

PHOTOGRAPHS

TARGET DATE AND TIME:

FROM

TO

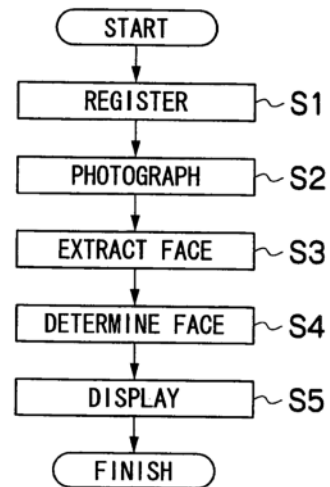
ESTIMATED FINISH:

SET

CANCEL

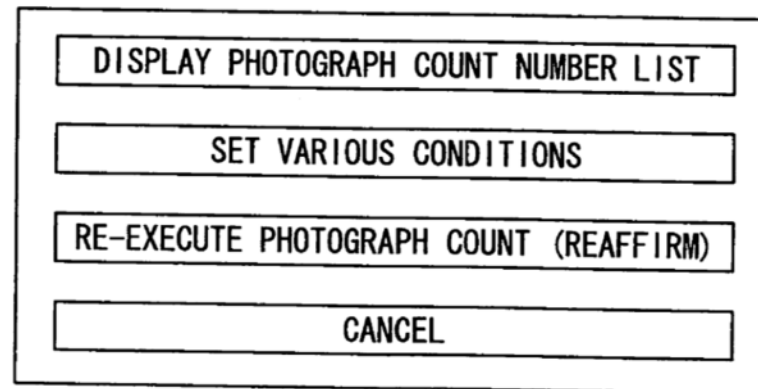
Nakashima at Fig. 9

FIG.9



Nakashima at Fig. 10

FIG.10



Nakashima at Fig. 11

FIG.11

ID	NAME	TARGET	PHOTOGRAPH QUANTITY	MAIN QUANTITY
4	KAZUKO KATO	ON	0	0
5	SABURO YAMAMOTO	ON	1	0
2	HANAKO TAKAHASHI	ON	3	1
1	TARO FUJI	ON	5	2
3	JIRO SUZUKI	OFF	0	0

DISPLAY DETAILS

BACK

Nakashima at Fig. 12

FIG.12

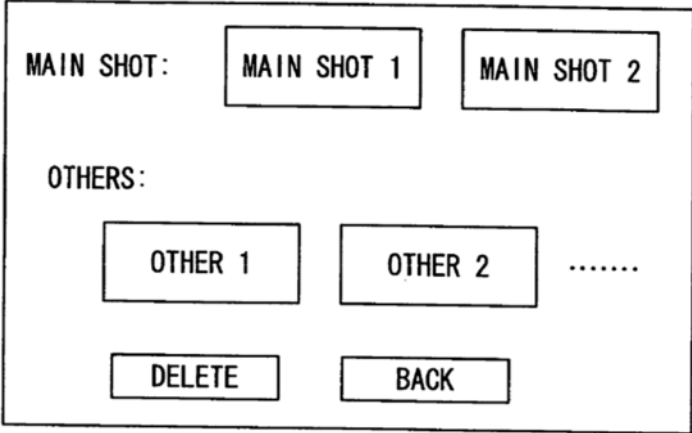
FACE DATA

SUBJECT ID:1
NAME: TARO FUJI
PHOTOGRAPH COUNT: 5
MAIN SHOT QUANTITY: 2
PHOTOGRAPH TARGET: ON

DISPLAY PHOTOGRAPHED
IMAGE LIST

BACK

Nakashima at Fig. 13

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	FIG.13  Nakashima at [0124]–[0130] Referring now to FIG. 6, a photographed image list table 75b is stored in the hard disk 75. In this table, photographed images which are images obtained by fully pressing the release switch 104; subject IDs identified from the images by the face determination section 20d (in other words, identification information of the subjects shown in the image); main subject IDs which are the subject IDs of main subjects in the images; “face size inappropriate subject IDs” which are subject ID for subjects photographed at a size inappropriate for viewing or printing; “eyes inappropriate (half-open) subject IDs” which are subject IDs for subjects with eyes shut or half-open; and “line of sight inappropriate subject IDs” which are subject IDs for subjects whose lines of sight are inappropriate, are related to each other and stored. Determination of which subject's subject ID should be stored in the photographed image list table as a “main subject ID”, a “face size inappropriate subject ID”, an “eyes inappropriate (half-open) subject ID” or a “line of sight inappropriate subject ID” may be either performed through software processing executed by the CPU 20, or through arbitrary operation of the operation section 120 by the user. For instance, the face determination section 20 determines whether an extracted facial image detected by the face extraction section 20a is under a predefined size (for example, an absolute threshold such as 100 by 100 pixels, or a relative threshold such as the area ratio of the extracted image to the original image)

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	(face size determination). If the extracted facial image is under the predefined size, a subject ID corresponding to a registered facial image matching a facial image of the facial region is related to the image as a “face size inappropriate subject ID”, and stored in the photographed image list table 75b. Alternatively, the face determination section 20 stores a subject ID corresponding to a registered facial image matching a facial region in which the eyes are determined by the eyes open/shut detection section 20c to be shut and/or half-open as an eyes inappropriate (half-open) subject ID into the photographed image list table 75b. In addition, the face determination section 20 displays a list of extracted facial images detected by the face extraction section 20a onto the image display LCD 102 to have the user select an extracted facial image where the line of sight is deviated, and stores a subject ID corresponding to a registered facial image matching the selected extracted facial image as a line of sight inappropriate subject ID into the photographed image list table 75b. Alternatively, the face determination section 20 determines whether an extracted facial image is a main subject based on whether the extracted facial image was at a predefined position, such as the focus position of the AF detection section 150 or the vicinity of the center of the original image upon half-pressing of the release switch 104 (main subject determination). However, if there is only one extracted facial image, the extracted facial image is determined to be the main subject regardless of whether it is positioned at a predefined position. When an extracted facial image is determined to be the main subject, a subject ID corresponding to a registered facial image matching the extracted facial image is stored in the photographed image list table 75b as a main subject ID. While the above-described face extraction section 20a, eye region detection section 20b, eye open/shut detection section 20c, face determination section 20d, subject management section 20e, and the display control section 20f are programs executed by the main CPU 20, a variation configured so that either a portion of or all of the above programs are implemented in a dedicated semiconductor integrated circuit (ASIC or Application Specific Integrated Circuit) is also possible. This variation is preferable, since it reduces the load on the main CPU 20. Nakashima at [0131]–[0133] Referring now to FIG. 7, a photograph quantity by subject list table 75c is stored in the hard disk 75. Among the images stored in the HDD 75, to all original images or desired original images specified via the operation section 120, the photograph quantity by subject list table 75c relates: “photograph quantities” which indicate the total number of original images containing an extracted facial image matching a registered facial image; “photograph targets” which are flags indicating whether an original image will be a target of face extraction by the face extraction section 20a; “main shot quantities” which

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	are the total number of original images in which the extracted facial image is the main subject; and “subject IDs” and “names” corresponding to registered facial images matching the extracted facial images. Counting of the photograph quantity for each subject is performed by the subject management section 20e by individually adding up the number of extracted facial images, among those extracted from the original image by the face extraction section 20a, which match a certain registered facial image for each registered image. In addition, counting of the main shot quantity for each subject is performed by the subject management section 20e by individually adding up the number of extracted facial images positioned at the focus position of the AF detection section 150 or the vicinity of the center of the original image during photography for each registered image matching the extracted facial images. While a description will be provided later, the subject management section 20e may also be arranged to exclude original images which include extracted facial images corresponding to subject IDs stored as “face size inappropriate subject IDs”, “eyes inappropriate (half-open) subject IDs” or “line of sight inappropriate subject IDs” from the aggregate total of the photograph quantities. Nakashima at [0136]–[0143] FIG. 8 shows a condition setting screen which is an example of the GUI. Items settable by the condition setting screen are: a “face size” which is a relative area ratio threshold used for face size determination of an extracted facial image to an original image; whether facial images with eyes half-open will be considered valid/invalid as extracted facial images; whether only extracted facial images with subjects looking straight into the camera will be calculated for photograph quantities and main shot quantities; whether only extracted facial images in which their subjects are main subjects will be calculated for main shot quantities; a “minimum photograph quantity” which is a prescribed photograph quantity; an original image range which the face extraction section 20a targets for extracting facial regions (in this example, “from (start)” and “to (end)” of time and date of photography; and an estimated time of finish of photography of a subject. The relationships between the setting items of the condition setting screen and the operation conditions of the programs are as follows. The face determination section 20d references an area ratio threshold set so as to correspond to a subject ID to determine whether the relative area ratio of a registered facial image corresponding to that subject ID to its original image exceeds the threshold. If not, the subject ID is stored as a “face size inappropriate subject ID”. Additionally, if “half-open invalid” is checked for a subject ID, in addition to an extracted facial image in which the eyes are completely shut, the eyes open/shut detection section 20c also stores an extracted

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	facial image in which the eyes are neither completely shut nor completely open (so-called half-open) as an “eyes inappropriate (half-open) subject ID”. Moreover, the subject management section 20e calculates an aggregate total of “main shot IDs” only when “main shot” is checked for a subject ID. If a “minimum photography quantity” of 1 or above is set for a subject ID, the subject management section 20e references the “photograph quantity” corresponding to that subject ID at a predefined timing (for instance, the time set as “estimated finish”, or after a lapse of a predefined time, such as 15 minutes, after setting to photography mode). If the “photograph quantity” is under the “minimum photography quantity”, a predefined warning is displayed on the liquid crystal 71. Alternatively, a warning message indicating the name of a subject for which the “photograph quantity” is under the “minimum photography quantity” may be played back through a speaker, not shown. This allows the photographer to easily acknowledge which subject's photograph quantity has not reached a prescribed quantity without having to go through the trouble of visually confirming the photograph quantity. Furthermore, if “from” and “to” have been set, the face extraction section 20a performs face extraction only on original images with image recording dates/times recorded in datetimeoriginal tags or the like which are within the range defined by “from” and “to”. This allows a photographer to arbitrarily specify at what timing images should be photographed to become targets of facial extraction, and is therefore preferable. These setting items are individually settable for each subject ID, and set items are only valid for registered facial images corresponding to each subject ID. Conditions set with this screen are related to subject IDs and stored in the EEPROM 146 or the like, and will become the conditions to which the main CPU 20 conforms when executing the various programs. Nakashima at [0151] On the other hand, the “photograph quantity” of the photograph quantity by subject list table 75c, which is the total number of photographed images for which subject IDs were identified by the facial determination section 20d, is updated for each subject ID. In other words, whenever photography is performed, the total number of each subject appearing in the images photographed thus far is stored into the photograph quantity by subject list table 75c. Nakashima at [0156]–[0158] FIG. 10 shows an example of a camera mode selection screen. In this camera mode selection screen, buttons for specifying four types of operations, namely “display photograph count list”, “set various conditions”, “re-execute photograph count” and “cancel”, are displayed. Each menu may be

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	selected/specified using the cross-shape key 124 or the like in the operation section to execute operations corresponding to each selected mode. “Re-execute photograph count” is a button used to give the re-execution instruction of step S4. The processing of step S4 is executed upon operation of this button. When “display photograph count list” is selected, the display control section 20f displays information stored in the photograph quantity by subject list table 75c on the liquid crystal panel 71. Nakashima at [0159] FIG. 11 is an example of a list display of the contents of the photograph quantity by subject list table 75c. As shown in FIG. 11, list information composed of a subject ID, name, photograph target flag, photograph quantity, and number of main subjects related to each other in the photograph quantity by subject list table 75c is displayed in list format on the liquid crystal panel 71. At this point, the list information may be displayed after sorting in ascending/descending order of photograph quantity per subject. This allows a photographer to easily acknowledge which subject has had fewer or more photographs taken than others, and is useful in preventing or correcting occurrences of biases among the photograph quantity to be subsequently taken for the subjects. Nakashima at [0161] FIG. 12 shows a display example of individual information. For instance, in addition to specified list information (subject ID, name, photograph quantity, main shot quantity, photograph target flag), a registered facial image is displayed on this screen. A photographer may reference this screen and confirm which subject has had fewer or more photographs taken than others while looking at the faces or names of the subjects. Nakashima at [0163] A “photographed image list display” button is provided on this screen. When the “photographed image list display” button is selected, the display control section 20f displays a list of photographed images corresponding to the subject ID of the specified list information. Nakashima at [0165]–[0167] FIG. 13 shows a list display example of photographed images. In the particular example shown in FIG. 13, the display control section 20f displays photographed images which correspond to a subject ID stored in the photographed image list table 75b as a “main subject ID” among the subject IDs of the specified list information as “main shots”, and displays such “main shots” to be distinguishable from other photographed images. This allows photographed images showing the specified desired subject as a main

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	subject to be displayed separately from the other photographed images, and enables a photographer to grasp at a glance which subject is featured as a main subject in which photographed image. Photographed images may be deleted and organized on this screen. In other words, by selecting a desired photographed image and operating a “delete” button at the top of the screen, the selected photographed image is deleted from the HDD 75 or the like. When “setting various conditions” is selected on the camera mode selection screen, a condition setting screen (refer to FIG. 8) for setting determination of eyes shut/half-open, determination of face size, and various other conditions for narrowing down the images to be displayed on the photographed image list is displayed. To the extent Maxell contends Nakashima does not disclose this limitation, a person of ordinary skill in the art would have readily arrived at this limitation by combining or modifying it in view of their general knowledge and/or the prior art references disclosed in the corresponding section of Samsung’s Invalidity Contentions.
[12b] wherein a reproducing time required for reproducing the image information under the third reproducing mode is longer than the reproducing time required for reproducing the image information under the second reproducing mode.	Nakashima discloses “wherein a reproducing time required for reproducing the image information under the third reproducing mode is longer than the reproducing time required for reproducing the image information under the second reproducing mode.” For example:

Nakashima at Fig. 6

FIG.6

PHOTOGRAPHED IMAGE LIST TABLE						
IMAGE FILE NAME	SUBJECT ID	MAIN SUBJECT ID	FACE SIZE / INAPPROPRIATE SUBJECT ID	EYES / INAPPROPRIATE (HALF-OPEN) SUBJECT ID	EYES / INAPPROPRIATE SUBJECT ID	EYES / INAPPROPRIATE SUBJECT ID
DIS00001.jpg	1, 2, 4, 5, 6	1	4	-	7	6
DIS00002.jpg	1, 2, 3, 6, 7, 8	2	5	-	7	6
...	...	...	...	...	...	...

Nakashima at Fig. 7

FIG.7

PHOTOGRAPH QUANTITY BY SUBJECT LIST TABLE				
SUBJECT ID	NAME	PHOTOGRAPH TARGET	PHOTOGRAPH QUANTITY	MAIN SHOT QUANTITY
1	TARO FUJI	ON	5	2
2	HANAKO TAKAHASHI	ON	3	1
3	JIRO SUZUKI	OFF	0	0
4	KAZUKO KATO	ON	0	0
5	SAKURO TANABATO	ON	1	0
...	...	...	...	...

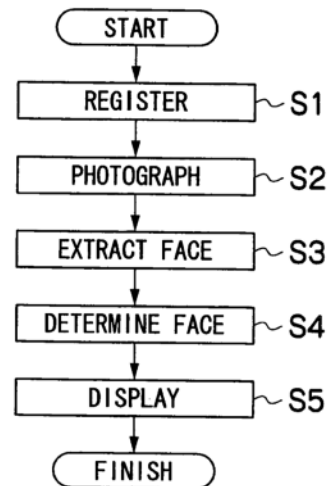
Nakashima at Fig. 8

FIG.8

FACE SIZE:		% OR OVER
EYES:		HALF-OPEN INVALID
LINE OF SIGHT:		ONLY STRAIGHT INTO CAMERA VALID
MAIN SHOT:		VALID
MINIMUM PHOTOGRAPH QUANTITY:		PHOTOGRAPHS
TARGET DATE AND TIME:		
FROM		
TO		
ESTIMATED FINISH:		
SET CANCEL		

Nakashima at Fig. 9

FIG.9



Nakashima at Fig. 10

FIG.10

FIG.10 is a menu screen with four buttons arranged vertically. The buttons are labeled: "DISPLAY PHOTOGRAPH COUNT NUMBER LIST", "SET VARIOUS CONDITIONS", "RE-EXECUTE PHOTOGRAPH COUNT (REAFFIRM)", and "CANCEL".

Nakashima at Fig. 11

FIG.11

FIG.11 is a screen displaying a table of photograph counts. The table has five columns: ID, NAME, TARGET, PHOTOGRAPH QUANTITY, and MAIN QUANTITY. Below the table are two buttons: "DISPLAY DETAILS" and "BACK".

ID	NAME	TARGET	PHOTOGRAPH QUANTITY	MAIN QUANTITY
4	KAZUKO KATO	ON	0	0
5	SABURO YAMAMOTO	ON	1	0
2	HANAKO TAKAHASHI	ON	3	1
1	TARO FUJI	ON	5	2
3	JIRO SUZUKI	OFF	0	0

Nakashima at Fig. 12

FIG.12

FACE DATA	SUBJECT ID:1
	NAME: TARO FUJI
	PHOTOGRAPH COUNT: 5
	MAIN SHOT QUANTITY: 2
	PHOTOGRAPH TARGET: ON
DISPLAY PHOTOGRAPHED IMAGE LIST	BACK

Nakashima at Fig. 13

FIG.13

MAIN SHOT:	MAIN SHOT 1	MAIN SHOT 2
OTHERS:		
OTHER 1	OTHER 2	
DELETE	BACK	

Nakashima at [0124]–[0130]

Referring now to FIG. 6, a photographed image list table 75b is stored in the hard disk 75. In this table, photographed images which are images obtained by fully pressing the release switch 104; subject IDs identified from the images by the face determination section 20d (in other words, identification information of the subjects shown in the image); main subject IDs which are the subject IDs of main subjects in the images; “face size inappropriate subject IDs” which are subject ID for subjects photographed at a size inappropriate for viewing or printing; “eyes inappropriate (half-open) subject IDs” which are subject IDs for subjects with eyes shut or half-open; and “line of sight inappropriate subject IDs” which are subject IDs for subjects whose lines of sight are inappropriate, are related to each other and stored.

Determination of which subject's subject ID should be stored in the photographed image list table as a “main subject ID”, a “face size inappropriate subject ID”, an “eyes inappropriate (half-open) subject ID” or a “line of sight inappropriate subject ID” may be either performed through software processing executed by the CPU 20, or through arbitrary operation of the operation section 120 by the user.

For instance, the face determination section 20 determines whether an extracted facial image detected by the face extraction section 20a is under a predefined size (for example, an absolute threshold such as 100 by 100 pixels, or a relative threshold such as the area ratio of the extracted image to the original image) (face size determination). If the extracted facial image is under the predefined size, a subject ID corresponding to a registered facial image matching a facial image of the facial region is related to the image as a “face size inappropriate subject ID”, and stored in the photographed image list table 75b.

Alternatively, the face determination section 20 stores a subject ID corresponding to a registered facial image matching a facial region in which the eyes are determined by the eyes open/shut detection section 20c to be shut and/or half-open as an eyes inappropriate (half-open) subject ID into the photographed image list table 75b.

In addition, the face determination section 20 displays a list of extracted facial images detected by the face extraction section 20a onto the image display LCD 102 to have the user select an extracted facial image where the line of sight is deviated, and stores a subject ID corresponding to a registered facial image matching the selected extracted facial image as a line of sight inappropriate subject ID into the photographed image list table 75b.

Alternatively, the face determination section 20 determines whether an extracted facial image is a main subject based on whether the extracted facial image was at a predefined position, such as the focus position of the AF detection section 150 or the vicinity of the center of the original image upon half-pressing of the release switch 104 (main subject determination). However, if there is only one extracted facial image, the extracted facial image is determined to be the main subject regardless of whether it is positioned at a predefined position. When an extracted facial image is determined to be the main subject,

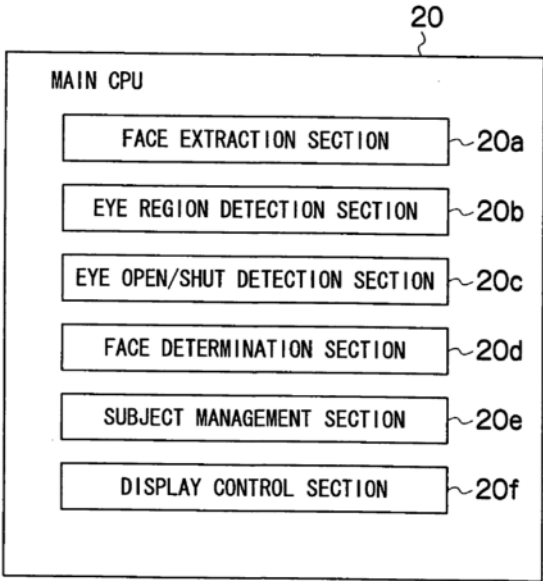
'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	a subject ID corresponding to a registered facial image matching the extracted facial image is stored in the photographed image list table 75b as a main subject ID. While the above-described face extraction section 20a, eye region detection section 20b, eye open/shut detection section 20c, face determination section 20d, subject management section 20e, and the display control section 20f are programs executed by the main CPU 20, a variation configured so that either a portion of or all of the above programs are implemented in a dedicated semiconductor integrated circuit (ASIC or Application Specific Integrated Circuit) is also possible. This variation is preferable, since it reduces the load on the main CPU 20. Nakashima at [0131]–[0133] Referring now to FIG. 7, a photograph quantity by subject list table 75c is stored in the hard disk 75. Among the images stored in the HDD 75, to all original images or desired original images specified via the operation section 120, the photograph quantity by subject list table 75c relates: “photograph quantities” which indicate the total number of original images containing an extracted facial image matching a registered facial image; “photograph targets” which are flags indicating whether an original image will be a target of face extraction by the face extraction section 20a; “main shot quantities” which are the total number of original images in which the extracted facial image is the main subject; and “subject IDs” and “names” corresponding to registered facial images matching the extracted facial images. Counting of the photograph quantity for each subject is performed by the subject management section 20e by individually adding up the number of extracted facial images, among those extracted from the original image by the face extraction section 20a, which match a certain registered facial image for each registered image. In addition, counting of the main shot quantity for each subject is performed by the subject management section 20e by individually adding up the number of extracted facial images positioned at the focus position of the AF detection section 150 or the vicinity of the center of the original image during photography for each registered image matching the extracted facial images. While a description will be provided later, the subject management section 20e may also be arranged to exclude original images which include extracted facial images corresponding to subject IDs stored as “face size inappropriate subject IDs”, “eyes inappropriate (half-open) subject IDs” or “line of sight inappropriate subject IDs” from the aggregate total of the photograph quantities. Nakashima at [0136]–[0143] FIG. 8 shows a condition setting screen which is an example of the GUI. Items settable by the condition setting screen are: a “face size” which is a relative area ratio threshold used for face size determination of

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	an extracted facial image to an original image; whether facial images with eyes half-open will be considered valid/invalid as extracted facial images; whether only extracted facial images with subjects looking straight into the camera will be calculated for photograph quantities and main shot quantities; whether only extracted facial images in which their subjects are main subjects will be calculated for main shot quantities; a “minimum photograph quantity” which is a prescribed photograph quantity; an original image range which the face extraction section 20a targets for extracting facial regions (in this example, “from (start)” and “to (end)” of time and date of photography; and an estimated time of finish of photography of a subject. The relationships between the setting items of the condition setting screen and the operation conditions of the programs are as follows. The face determination section 20d references an area ratio threshold set so as to correspond to a subject ID to determine whether the relative area ratio of a registered facial image corresponding to that subject ID to its original image exceeds the threshold. If not, the subject ID is stored as a “face size inappropriate subject ID”. Additionally, if “half-open invalid” is checked for a subject ID, in addition to an extracted facial image in which the eyes are completely shut, the eyes open/shut detection section 20c also stores an extracted facial image in which the eyes are neither completely shut nor completely open (so-called half-open) as an “eyes inappropriate (half-open) subject ID”. Moreover, the subject management section 20e calculates an aggregate total of “main shot IDs” only when “main shot” is checked for a subject ID. If a “minimum photography quantity” of 1 or above is set for a subject ID, the subject management section 20e references the “photograph quantity” corresponding to that subject ID at a predefined timing (for instance, the time set as “estimated finish”, or after a lapse of a predefined time, such as 15 minutes, after setting to photography mode). If the “photograph quantity” is under the “minimum photography quantity”, a predefined warning is displayed on the liquid crystal 71. Alternatively, a warning message indicating the name of a subject for which the “photograph quantity” is under the “minimum photography quantity” may be played back through a speaker, not shown. This allows the photographer to easily acknowledge which subject's photograph quantity has not reached a prescribed quantity without having to go through the trouble of visually confirming the photograph quantity. Furthermore, if “from” and “to” have been set, the face extraction section 20a performs face extraction only on original images with image recording dates/times recorded in datetimeoriginal tags or the like which are within the range defined by “from” and “to”. This allows a photographer to arbitrarily specify at what timing images should be photographed to become targets of facial extraction, and is therefore preferable.

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	These setting items are individually settable for each subject ID, and set items are only valid for registered facial images corresponding to each subject ID. Conditions set with this screen are related to subject IDs and stored in the EEPROM 146 or the like, and will become the conditions to which the main CPU 20 conforms when executing the various programs. Nakashima at [0156]–[0158] FIG. 10 shows an example of a camera mode selection screen. In this camera mode selection screen, buttons for specifying four types of operations, namely “display photograph count list”, “set various conditions”, “re-execute photograph count” and “cancel”, are displayed. Each menu may be selected/specified using the cross-shape key 124 or the like in the operation section to execute operations corresponding to each selected mode. “Re-execute photograph count” is a button used to give the re-execution instruction of step S4. The processing of step S4 is executed upon operation of this button. When “display photograph count list” is selected, the display control section 20f displays information stored in the photograph quantity by subject list table 75c on the liquid crystal panel 71. Nakashima at [0159] FIG. 11 is an example of a list display of the contents of the photograph quantity by subject list table 75c. As shown in FIG. 11, list information composed of a subject ID, name, photograph target flag, photograph quantity, and number of main subjects related to each other in the photograph quantity by subject list table 75c is displayed in list format on the liquid crystal panel 71. At this point, the list information may be displayed after sorting in ascending/descending order of photograph quantity per subject. This allows a photographer to easily acknowledge which subject has had fewer or more photographs taken than others, and is useful in preventing or correcting occurrences of biases among the photograph quantity to be subsequently taken for the subjects. Nakashima at [0161] FIG. 12 shows a display example of individual information. For instance, in addition to specified list information (subject ID, name, photograph quantity, main shot quantity, photograph target flag), a registered facial image is displayed on this screen. A photographer may reference this screen and confirm which subject has had fewer or more photographs taken than others while looking at the faces or names of the subjects.

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	Nakashima at [0163] A “photographed image list display” button is provided on this screen. When the “photographed image list display” button is selected, the display control section 20f displays a list of photographed images corresponding to the subject ID of the specified list information. Nakashima at [0165]–[0167] FIG. 13 shows a list display example of photographed images. In the particular example shown in FIG. 13, the display control section 20f displays photographed images which correspond to a subject ID stored in the photographed image list table 75b as a “main subject ID” among the subject IDs of the specified list information as “main shots”, and displays such “main shots” to be distinguishable from other photographed images. This allows photographed images showing the specified desired subject as a main subject to be displayed separately from the other photographed images, and enables a photographer to grasp at a glance which subject is featured as a main subject in which photographed image. Photographed images may be deleted and organized on this screen. In other words, by selecting a desired photographed image and operating a “delete” button at the top of the screen, the selected photographed image is deleted from the HDD 75 or the like. When “setting various conditions” is selected on the camera mode selection screen, a condition setting screen (refer to FIG. 8) for setting determination of eyes shut/half-open, determination of face size, and various other conditions for narrowing down the images to be displayed on the photographed image list is displayed. To the extent Maxell contends Nakashima does not disclose this limitation, a person of ordinary skill in the art would have readily arrived at this limitation by combining or modifying it in view of their general knowledge and/or the prior art references disclosed in the corresponding section of Samsung’s Invalidity Contentions.
[13pre] 13. A recording and reproducing apparatus for recording and reproducing image information, comprising:	To the extent the preamble is limiting, Nakashima discloses “[a] recording and reproducing apparatus for recording and reproducing image information.” See above at limitation [8pre].
[13a] a photographing sensor configured to photograph an	Nakashima discloses “a photographing sensor configured to photograph an object and generate image information.” See above at limitation [8c].

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object and generate image information;	
[13b] a recorder configured to record the image information generated by the photographing sensor in a recording medium;	Nakashima discloses “a recorder configured to record the image information generated by the photographing sensor in a recording medium.” See above at limitation [8d].
[13c] a reproducer configured to reproduce the image information recorded by the recorder;	Nakashima discloses “a reproducer configured to reproduce the image information recorded by the recorder.” See above at limitation [8f].
[13d] processing circuitry configured to:	Nakashima discloses “processing circuitry.” See above at limitation [8a].
[13e] execute a face-recognizing process on the image information generated by the photographing sensor to recognize a face,	Nakashima discloses “execute a face-recognizing process on the image information generated by the photographing sensor to recognize a face.” See above at limitation [8e].
[13f] register a person in the image information as a specific person in a mode selected from a first setting mode and a second setting mode, wherein, when the first setting mode is selected, a person with a face is obtained by newly photographing the person in a photographing mode and thereafter registered as the specific person, and,	Nakashima discloses “register a person in the image information as a specific person in a mode selected from a first setting mode and a second setting mode, wherein, when the first setting mode is selected, a person with a face is obtained by newly photographing the person in a photographing mode and thereafter registered as the specific person.” See above at limitation [8g].
[13g] when the second setting mode is selected, a person with a face in the image information is selected from a plurality of faces	Nakashima discloses “when the second setting mode is selected, a person with a face in the image information is selected from a plurality of faces in the image information recorded in the recording medium and thereafter registered as the specific person.” See above at limitation [8h].

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in the image information recorded in the recording medium and thereafter registered as the specific person,	
[13h] firstly pick out image information which includes the registered specific person,	Nakashima discloses “firstly pick out image information which includes the registered specific person.” For example: Nakashima at Fig. 4  <pre> graph TD subgraph 20 [MAIN CPU] 20a[FACE EXTRACTION SECTION] 20b[EYE REGION DETECTION SECTION] 20c[EYE OPEN/SHUT DETECTION SECTION] 20d[FACE DETERMINATION SECTION] 20e[SUBJECT MANAGEMENT SECTION] 20f[DISPLAY CONTROL SECTION] end </pre>

Nakashima at Fig. 5

FIG.5

BASIC INFORMATION REGISTRATION TABLE

SUBJECT ID	NAME	REGISTERED FACIAL IMAGE
1	TARO FUJI	image001. jpg
2	HANAKO TAKAHASHI	image002. jpg
3	JIRO SUZUKI	image003. jpg
4	KAZUKO KATO	image004. jpg
5	SABURO YAMAMOTO	image005. jpg
⋮	⋮	⋮

~75a

Nakashima at Fig. 6

FIG.6

PHOTOGRAPHED IMAGE LIST TABLE					
IMAGE FILE NAME	SUBJECT ID	MAIN SUBJECT ID	FACE SIZE INAPPROPRIATE SUBJECT ID	EYES INAPPROPRIATE (HALF-OPEN) SUBJECT ID	EYES INAPPROPRIATE SUBJECT ID
00000001. jpg	1, 2, 4, 5, 6	1	4	—	6
00000002. jpg	1, 2, 3, 5, 7, 8	2	5	7	6
⋮	⋮	⋮	⋮	⋮	⋮

~75b

Nakashima at Fig. 7

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FIG.7

PHOTOGRAPH QUANTITY BY SUBJECT LIST TABLE					
SUBJECT ID	NAME	PHOTOGRAPH TARGET	PHOTOGRAPH QUANTITY	MAIN SHOT QUANTITY	
1	TARO FUJI	ON	5	2	2
2	HANAKO TAKAHASHI	ON	3	1	1
3	JIRO SUZUKI	OFF	0	0	0
4	KAZUKO KATO	ON	0	0	0
5	SHIGURO YAMAMOTO	ON	1	0	0
....					

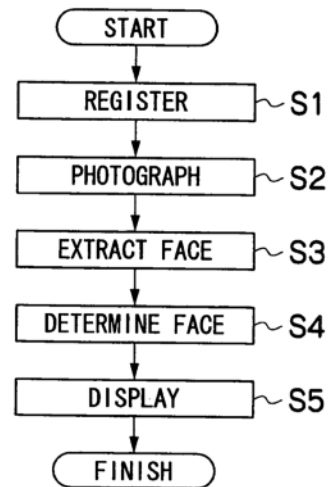
Nakashima at Fig. 8

FIG.8

FACE SIZE:		% OR OVER
EYES:		HALF-OPEN INVALID
LINE OF SIGHT:		ONLY STRAIGHT INTO CAMERA VALID
MAIN SHOT:		VALID
MINIMUM PHOTOGRAPH QUANTITY:		PHOTOGRAPHS
TARGET DATE AND TIME:		
FROM		
TO		
ESTIMATED FINISH:		
SET CANCEL		

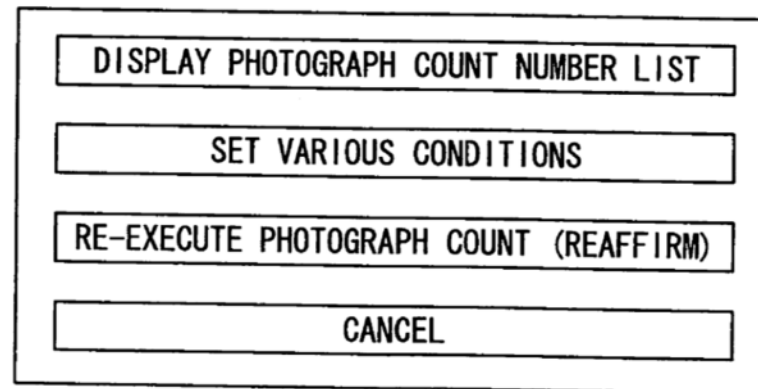
Nakashima at Fig. 9

FIG.9



Nakashima at Fig. 10

FIG.10



Nakashima at Fig. 11

FIG.11

ID	NAME	TARGET	PHOTOGRAPH QUANTITY	MAIN QUANTITY
4	KAZUKO KATO	ON	0	0
5	SABURO YAMAMOTO	ON	1	0
2	HANAKO TAKAHASHI	ON	3	1
1	TARO FUJI	ON	5	2
3	JIRO SUZUKI	OFF	0	0

DISPLAY DETAILS

BACK

Nakashima at Fig. 12

FIG.12

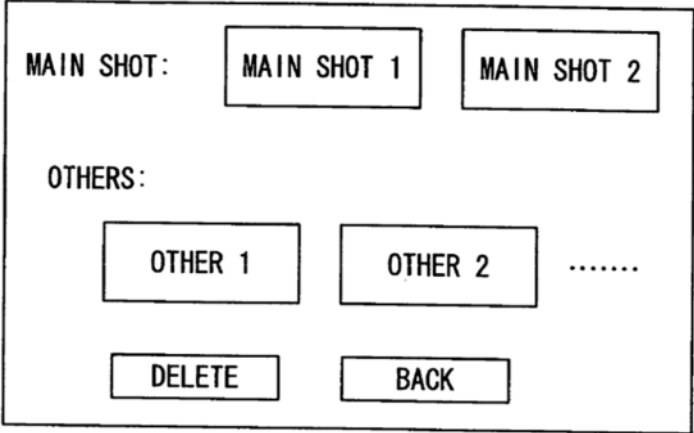
FACE DATA

SUBJECT ID:1
NAME: TARO FUJI
PHOTOGRAPH COUNT: 5
MAIN SHOT QUANTITY: 2
PHOTOGRAPH TARGET: ON

DISPLAY PHOTOGRAPHED
IMAGE LIST

BACK

Nakashima at Fig. 13

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	FIG.13  Nakashima at [0011]–[0012] Moreover, the photograph quantity calculation section may be arranged to calculate a main subject photograph quantity which is the total number of photographed images in which extracted facial images of a subject determined to be the main subject by the main subject determination section are extracted, while the display section may display the main subject photograph quantity at a predefined timing. In other words, by limiting the displayed number of photographed images to only those for the main subject, the number of photographed images featuring the main subject can be learned in a convenient manner. Nakashima at [0121] The face determination section 20d identifies a registration facial image matching an extracted facial image extracted by the face extraction section 20a from a basic information registration table 75a in the HDD 75, herein after-mentioned, and identifies the subject ID corresponding to the identified registration facial image. Various facial recognition techniques may be used to determine matches between registration facial images and extracted facial images. For instance, matches may be determined based on face sizes, face contours, eye positions or the like.

Nakashima at [0124]–[0130]

Referring now to FIG. 6, a photographed image list table 75b is stored in the hard disk 75. In this table, photographed images which are images obtained by fully pressing the release switch 104; subject IDs identified from the images by the face determination section 20d (in other words, identification information of the subjects shown in the image); main subject IDs which are the subject IDs of main subjects in the images; “face size inappropriate subject IDs” which are subject ID for subjects photographed at a size inappropriate for viewing or printing; “eyes inappropriate (half-open) subject IDs” which are subject IDs for subjects with eyes shut or half-open; and “line of sight inappropriate subject IDs” which are subject IDs for subjects whose lines of sight are inappropriate, are related to each other and stored.

Determination of which subject's subject ID should be stored in the photographed image list table as a “main subject ID”, a “face size inappropriate subject ID”, an “eyes inappropriate (half-open) subject ID” or a “line of sight inappropriate subject ID” may be either performed through software processing executed by the CPU 20, or through arbitrary operation of the operation section 120 by the user.

For instance, the face determination section 20 determines whether an extracted facial image detected by the face extraction section 20a is under a predefined size (for example, an absolute threshold such as 100 by 100 pixels, or a relative threshold such as the area ratio of the extracted image to the original image) (face size determination). If the extracted facial image is under the predefined size, a subject ID corresponding to a registered facial image matching a facial image of the facial region is related to the image as a “face size inappropriate subject ID”, and stored in the photographed image list table 75b.

Alternatively, the face determination section 20 stores a subject ID corresponding to a registered facial image matching a facial region in which the eyes are determined by the eyes open/shut detection section 20c to be shut and/or half-open as an eyes inappropriate (half-open) subject ID into the photographed image list table 75b.

In addition, the face determination section 20 displays a list of extracted facial images detected by the face extraction section 20a onto the image display LCD 102 to have the user select an extracted facial image where the line of sight is deviated, and stores a subject ID corresponding to a registered facial image matching the selected extracted facial image as a line of sight inappropriate subject ID into the photographed image list table 75b.

Alternatively, the face determination section 20 determines whether an extracted facial image is a main subject based on whether the extracted facial image was at a predefined position, such as the focus position of the AF detection section 150 or the vicinity of the center of the original image upon half-pressing of the release switch 104 (main subject determination). However, if there is only one extracted facial image, the extracted facial image is determined to be the main subject regardless of whether it is positioned at a predefined position. When an extracted facial image is determined to be the main subject,

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	a subject ID corresponding to a registered facial image matching the extracted facial image is stored in the photographed image list table 75b as a main subject ID. While the above-described face extraction section 20a, eye region detection section 20b, eye open/shut detection section 20c, face determination section 20d, subject management section 20e, and the display control section 20f are programs executed by the main CPU 20, a variation configured so that either a portion of or all of the above programs are implemented in a dedicated semiconductor integrated circuit (ASIC or Application Specific Integrated Circuit) is also possible. This variation is preferable, since it reduces the load on the main CPU 20. Nakashima at [0131]–[0133] Referring now to FIG. 7, a photograph quantity by subject list table 75c is stored in the hard disk 75. Among the images stored in the HDD 75, to all original images or desired original images specified via the operation section 120, the photograph quantity by subject list table 75c relates: “photograph quantities” which indicate the total number of original images containing an extracted facial image matching a registered facial image; “photograph targets” which are flags indicating whether an original image will be a target of face extraction by the face extraction section 20a; “main shot quantities” which are the total number of original images in which the extracted facial image is the main subject; and “subject IDs” and “names” corresponding to registered facial images matching the extracted facial images. Counting of the photograph quantity for each subject is performed by the subject management section 20e by individually adding up the number of extracted facial images, among those extracted from the original image by the face extraction section 20a, which match a certain registered facial image for each registered image. In addition, counting of the main shot quantity for each subject is performed by the subject management section 20e by individually adding up the number of extracted facial images positioned at the focus position of the AF detection section 150 or the vicinity of the center of the original image during photography for each registered image matching the extracted facial images. While a description will be provided later, the subject management section 20e may also be arranged to exclude original images which include extracted facial images corresponding to subject IDs stored as “face size inappropriate subject IDs”, “eyes inappropriate (half-open) subject IDs” or “line of sight inappropriate subject IDs” from the aggregate total of the photograph quantities. Nakashima at [0136]–[0143] FIG. 8 shows a condition setting screen which is an example of the GUI. Items settable by the condition setting screen are: a “face size” which is a relative area ratio threshold used for face size determination of

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	an extracted facial image to an original image; whether facial images with eyes half-open will be considered valid/invalid as extracted facial images; whether only extracted facial images with subjects looking straight into the camera will be calculated for photograph quantities and main shot quantities; whether only extracted facial images in which their subjects are main subjects will be calculated for main shot quantities; a “minimum photograph quantity” which is a prescribed photograph quantity; an original image range which the face extraction section 20a targets for extracting facial regions (in this example, “from (start)” and “to (end)” of time and date of photography; and an estimated time of finish of photography of a subject. The relationships between the setting items of the condition setting screen and the operation conditions of the programs are as follows. The face determination section 20d references an area ratio threshold set so as to correspond to a subject ID to determine whether the relative area ratio of a registered facial image corresponding to that subject ID to its original image exceeds the threshold. If not, the subject ID is stored as a “face size inappropriate subject ID”. Additionally, if “half-open invalid” is checked for a subject ID, in addition to an extracted facial image in which the eyes are completely shut, the eyes open/shut detection section 20c also stores an extracted facial image in which the eyes are neither completely shut nor completely open (so-called half-open) as an “eyes inappropriate (half-open) subject ID”. Moreover, the subject management section 20e calculates an aggregate total of “main shot IDs” only when “main shot” is checked for a subject ID. If a “minimum photography quantity” of 1 or above is set for a subject ID, the subject management section 20e references the “photograph quantity” corresponding to that subject ID at a predefined timing (for instance, the time set as “estimated finish”, or after a lapse of a predefined time, such as 15 minutes, after setting to photography mode). If the “photograph quantity” is under the “minimum photography quantity”, a predefined warning is displayed on the liquid crystal 71. Alternatively, a warning message indicating the name of a subject for which the “photograph quantity” is under the “minimum photography quantity” may be played back through a speaker, not shown. This allows the photographer to easily acknowledge which subject's photograph quantity has not reached a prescribed quantity without having to go through the trouble of visually confirming the photograph quantity. Furthermore, if “from” and “to” have been set, the face extraction section 20a performs face extraction only on original images with image recording dates/times recorded in datetimeoriginal tags or the like which are within the range defined by “from” and “to”. This allows a photographer to arbitrarily specify at what timing images should be photographed to become targets of facial extraction, and is therefore preferable.

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	These setting items are individually settable for each subject ID, and set items are only valid for registered facial images corresponding to each subject ID. Conditions set with this screen are related to subject IDs and stored in the EEPROM 146 or the like, and will become the conditions to which the main CPU 20 conforms when executing the various programs. Nakashima at [0151] On the other hand, the “photograph quantity” of the photograph quantity by subject list table 75c, which is the total number of photographed images for which subject IDs were identified by the facial determination section 20d, is updated for each subject ID. In other words, whenever photography is performed, the total number of each subject appearing in the images photographed thus far is stored into the photograph quantity by subject list table 75c. Nakashima at [0156]–[0158] FIG. 10 shows an example of a camera mode selection screen. In this camera mode selection screen, buttons for specifying four types of operations, namely “display photograph count list”, “set various conditions”, “re-execute photograph count” and “cancel”, are displayed. Each menu may be selected/specified using the cross-shape key 124 or the like in the operation section to execute operations corresponding to each selected mode. “Re-execute photograph count” is a button used to give the re-execution instruction of step S4. The processing of step S4 is executed upon operation of this button. When “display photograph count list” is selected, the display control section 20f displays information stored in the photograph quantity by subject list table 75c on the liquid crystal panel 71. Nakashima at [0159] FIG. 11 is an example of a list display of the contents of the photograph quantity by subject list table 75c. As shown in FIG. 11, list information composed of a subject ID, name, photograph target flag, photograph quantity, and number of main subjects related to each other in the photograph quantity by subject list table 75c is displayed in list format on the liquid crystal panel 71. At this point, the list information may be displayed after sorting in ascending/descending order of photograph quantity per subject. This allows a photographer to easily acknowledge which subject has had fewer or more photographs taken than others, and is useful in preventing or correcting occurrences of biases among the photograph quantity to be subsequently taken for the subjects.

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	Nakashima at [0161] FIG. 12 shows a display example of individual information. For instance, in addition to specified list information (subject ID, name, photograph quantity, main shot quantity, photograph target flag), a registered facial image is displayed on this screen. A photographer may reference this screen and confirm which subject has had fewer or more photographs taken than others while looking at the faces or names of the subjects. Nakashima at [0163] A “photographed image list display” button is provided on this screen. When the “photographed image list display” button is selected, the display control section 20f displays a list of photographed images corresponding to the subject ID of the specified list information. Nakashima at [0165]–[0167] FIG. 13 shows a list display example of photographed images. In the particular example shown in FIG. 13, the display control section 20f displays photographed images which correspond to a subject ID stored in the photographed image list table 75b as a “main subject ID” among the subject IDs of the specified list information as “main shots”, and displays such “main shots” to be distinguishable from other photographed images. This allows photographed images showing the specified desired subject as a main subject to be displayed separately from the other photographed images, and enables a photographer to grasp at a glance which subject is featured as a main subject in which photographed image. Photographed images may be deleted and organized on this screen. In other words, by selecting a desired photographed image and operating a “delete” button at the top of the screen, the selected photographed image is deleted from the HDD 75 or the like. When “setting various conditions” is selected on the camera mode selection screen, a condition setting screen (refer to FIG. 8) for setting determination of eyes shut/half-open, determination of face size, and various other conditions for narrowing down the images to be displayed on the photographed image list is displayed. To the extent Maxell contends Nakashima does not disclose this limitation, a person of ordinary skill in the art would have readily arrived at this limitation by combining or modifying it in view of their general knowledge and/or the prior art references disclosed in the corresponding section of Samsung’s Invalidity Contentions.

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[13i] secondly pick out the image information based on a predetermined condition from among the picked-out image information which includes the registered specific person, the predetermined condition being set in accordance with an instruction by a user, and	Nakashima discloses “secondly pick out the image information based on a predetermined condition from among the picked-out image information which includes the registered specific person, the predetermined condition being set in accordance with an instruction by a user.” For example: Nakashima at Fig. 5 FIG.5 BASIC INFORMATION REGISTRATION TABLE <table><tr><th>SUBJECT ID</th><th>NAME</th><th>REGISTERED FACIAL IMAGE</th></tr><tr><td>1</td><td>TARO FUJI</td><td>image001. jpg</td></tr><tr><td>2</td><td>HANAKO TAKAHASHI</td><td>image002. jpg</td></tr><tr><td>3</td><td>JIRO SUZUKI</td><td>image003. jpg</td></tr><tr><td>4</td><td>KAZUKO KATO</td><td>image004. jpg</td></tr><tr><td>5</td><td>SABURO YAMAMOTO</td><td>image005. jpg</td></tr><tr><td>⋮</td><td>⋮</td><td>⋮</td></tr></table> ~75a	SUBJECT ID	NAME	REGISTERED FACIAL IMAGE	1	TARO FUJI	image001. jpg	2	HANAKO TAKAHASHI	image002. jpg	3	JIRO SUZUKI	image003. jpg	4	KAZUKO KATO	image004. jpg	5	SABURO YAMAMOTO	image005. jpg	⋮	⋮	⋮
SUBJECT ID	NAME	REGISTERED FACIAL IMAGE																				
1	TARO FUJI	image001. jpg																				
2	HANAKO TAKAHASHI	image002. jpg																				
3	JIRO SUZUKI	image003. jpg																				
4	KAZUKO KATO	image004. jpg																				
5	SABURO YAMAMOTO	image005. jpg																				
⋮	⋮	⋮																				

Nakashima at Fig. 7

FIG. 7

SUBJECT ID	NAME	PHOTOGRAPH TARGET	PHOTOGRAPH QUANTITY	MAIN SHOT QUANTITY
1	TARO FUJI	ON	5	2
2	HAKKO TAKAHASHI	ON	3	1
3	JIRO SUZUKI	OFF	0	0
4	KAZUKO KATO	ON	0	0
5	SHIGURO NAMOTO	ON	1	0
...	...	...	...	...

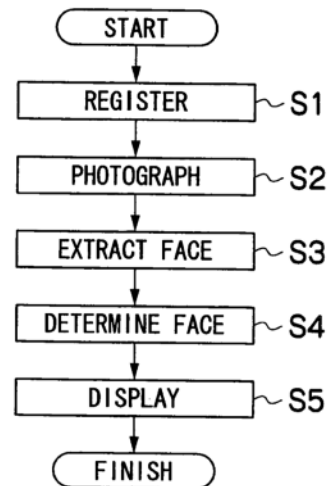
Nakashima at Fig. 8

FIG.8

FACE SIZE:		% OR OVER
EYES:		HALF-OPEN INVALID
LINE OF SIGHT:		ONLY STRAIGHT INTO CAMERA VALID
MAIN SHOT:		VALID
MINIMUM PHOTOGRAPH QUANTITY:		PHOTOGRAPHS
TARGET DATE AND TIME:		
FROM		
TO		
ESTIMATED FINISH:		
SET CANCEL		

Nakashima at Fig. 9

FIG.9



Nakashima at Fig. 10

FIG.10

FIG.10 is a menu screen with four buttons arranged vertically. The buttons are labeled: "DISPLAY PHOTOGRAPH COUNT NUMBER LIST", "SET VARIOUS CONDITIONS", "RE-EXECUTE PHOTOGRAPH COUNT (REAFFIRM)", and "CANCEL".

Nakashima at Fig. 11

FIG.11

FIG.11 is a screen displaying a table of photograph counts. The table has five columns: ID, NAME, TARGET, PHOTOGRAPH QUANTITY, and MAIN QUANTITY. Below the table are two buttons: "DISPLAY DETAILS" and "BACK".

ID	NAME	TARGET	PHOTOGRAPH QUANTITY	MAIN QUANTITY
4	KAZUKO KATO	ON	0	0
5	SABURO YAMAMOTO	ON	1	0
2	HANAKO TAKAHASHI	ON	3	1
1	TARO FUJI	ON	5	2
3	JIRO SUZUKI	OFF	0	0

Nakashima at Fig. 12

FIG.12

FACE DATA	SUBJECT ID:1 NAME: TARO FUJI PHOTOGRAPH COUNT: 5 MAIN SHOT QUANTITY: 2 PHOTOGRAPH TARGET: ON	
	<table border="0"><tr><td>DISPLAY PHOTOGRAPHED IMAGE LIST</td><td>BACK</td></tr></table>	DISPLAY PHOTOGRAPHED IMAGE LIST
DISPLAY PHOTOGRAPHED IMAGE LIST	BACK	

Nakashima at Fig. 13

FIG.13

MAIN SHOT:	MAIN SHOT 1	MAIN SHOT 2
OTHERS:		
OTHER 1	OTHER 2	
DELETE	BACK	

Nakashima at [0011]–[0012]

Moreover, the photograph quantity calculation section may be arranged to calculate a main subject photograph quantity which is the total number of photographed images in which extracted facial images of a subject determined to be the main subject by the main subject determination section are extracted, while the display section may display the main subject photograph quantity at a predefined timing.

In other words, by limiting the displayed number of photographed images to only those for the main subject, the number of photographed images featuring the main subject can be learned in a convenient manner.

Nakashima at [0124]–[0130]

Referring now to FIG. 6, a photographed image list table 75b is stored in the hard disk 75. In this table, photographed images which are images obtained by fully pressing the release switch 104; subject IDs identified from the images by the face determination section 20d (in other words, identification information of the subjects shown in the image); main subject IDs which are the subject IDs of main subjects in the images; “face size inappropriate subject IDs” which are subject ID for subjects photographed at a size inappropriate for viewing or printing; “eyes inappropriate (half-open) subject IDs” which are subject IDs for subjects with eyes shut or half-open; and “line of sight inappropriate subject IDs” which are subject IDs for subjects whose lines of sight are inappropriate, are related to each other and stored.

Determination of which subject's subject ID should be stored in the photographed image list table as a “main subject ID”, a “face size inappropriate subject ID”, an “eyes inappropriate (half-open) subject ID” or a “line of sight inappropriate subject ID” may be either performed through software processing executed by the CPU 20, or through arbitrary operation of the operation section 120 by the user.

For instance, the face determination section 20 determines whether an extracted facial image detected by the face extraction section 20a is under a predefined size (for example, an absolute threshold such as 100 by 100 pixels, or a relative threshold such as the area ratio of the extracted image to the original image) (face size determination). If the extracted facial image is under the predefined size, a subject ID corresponding to a registered facial image matching a facial image of the facial region is related to the image as a “face size inappropriate subject ID”, and stored in the photographed image list table 75b.

Alternatively, the face determination section 20 stores a subject ID corresponding to a registered facial image matching a facial region in which the eyes are determined by the eyes open/shut detection section 20c to be shut and/or half-open as an eyes inappropriate (half-open) subject ID into the photographed image list table 75b.

In addition, the face determination section 20 displays a list of extracted facial images detected by the face extraction section 20a onto the image display LCD 102 to have the user select an extracted facial

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	image where the line of sight is deviated, and stores a subject ID corresponding to a registered facial image matching the selected extracted facial image as a line of sight inappropriate subject ID into the photographed image list table 75b. Alternatively, the face determination section 20 determines whether an extracted facial image is a main subject based on whether the extracted facial image was at a predefined position, such as the focus position of the AF detection section 150 or the vicinity of the center of the original image upon half-pressing of the release switch 104 (main subject determination). However, if there is only one extracted facial image, the extracted facial image is determined to be the main subject regardless of whether it is positioned at a predefined position. When an extracted facial image is determined to be the main subject, a subject ID corresponding to a registered facial image matching the extracted facial image is stored in the photographed image list table 75b as a main subject ID. While the above-described face extraction section 20a, eye region detection section 20b, eye open/shut detection section 20c, face determination section 20d, subject management section 20e, and the display control section 20f are programs executed by the main CPU 20, a variation configured so that either a portion of or all of the above programs are implemented in a dedicated semiconductor integrated circuit (ASIC or Application Specific Integrated Circuit) is also possible. This variation is preferable, since it reduces the load on the main CPU 20. Nakashima at [0131]–[0133] Referring now to FIG. 7, a photograph quantity by subject list table 75c is stored in the hard disk 75. Among the images stored in the HDD 75, to all original images or desired original images specified via the operation section 120, the photograph quantity by subject list table 75c relates: “photograph quantities” which indicate the total number of original images containing an extracted facial image matching a registered facial image; “photograph targets” which are flags indicating whether an original image will be a target of face extraction by the face extraction section 20a; “main shot quantities” which are the total number of original images in which the extracted facial image is the main subject; and “subject IDs” and “names” corresponding to registered facial images matching the extracted facial images. Counting of the photograph quantity for each subject is performed by the subject management section 20e by individually adding up the number of extracted facial images, among those extracted from the original image by the face extraction section 20a, which match a certain registered facial image for each registered image. In addition, counting of the main shot quantity for each subject is performed by the subject management section 20e by individually adding up the number of extracted facial images

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	positioned at the focus position of the AF detection section 150 or the vicinity of the center of the original image during photography for each registered image matching the extracted facial images. While a description will be provided later, the subject management section 20e may also be arranged to exclude original images which include extracted facial images corresponding to subject IDs stored as “face size inappropriate subject IDs”, “eyes inappropriate (half-open) subject IDs” or “line of sight inappropriate subject IDs” from the aggregate total of the photograph quantities. Nakashima at [0136]–[0143] FIG. 8 shows a condition setting screen which is an example of the GUI. Items settable by the condition setting screen are: a “face size” which is a relative area ratio threshold used for face size determination of an extracted facial image to an original image; whether facial images with eyes half-open will be considered valid/invalid as extracted facial images; whether only extracted facial images with subjects looking straight into the camera will be calculated for photograph quantities and main shot quantities; whether only extracted facial images in which their subjects are main subjects will be calculated for main shot quantities; a “minimum photograph quantity” which is a prescribed photograph quantity; an original image range which the face extraction section 20a targets for extracting facial regions (in this example, “from (start)” and “to (end)” of time and date of photography; and an estimated time of finish of photography of a subject. The relationships between the setting items of the condition setting screen and the operation conditions of the programs are as follows. The face determination section 20d references an area ratio threshold set so as to correspond to a subject ID to determine whether the relative area ratio of a registered facial image corresponding to that subject ID to its original image exceeds the threshold. If not, the subject ID is stored as a “face size inappropriate subject ID”. Additionally, if “half-open invalid” is checked for a subject ID, in addition to an extracted facial image in which the eyes are completely shut, the eyes open/shut detection section 20c also stores an extracted facial image in which the eyes are neither completely shut nor completely open (so-called half-open) as an “eyes inappropriate (half-open) subject ID”. Moreover, the subject management section 20e calculates an aggregate total of “main shot IDs” only when “main shot” is checked for a subject ID. If a “minimum photograph quantity” of 1 or above is set for a subject ID, the subject management section 20e references the “photograph quantity” corresponding to that subject ID at a predefined timing (for instance, the time set as “estimated finish”, or after a lapse of a predefined time, such as 15 minutes, after setting to photography mode). If the “photograph quantity” is under the “minimum photograph quantity”, a predefined warning is displayed on the liquid crystal 71. Alternatively, a warning message

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	indicating the name of a subject for which the “photograph quantity” is under the “minimum photography quantity” may be played back through a speaker, not shown. This allows the photographer to easily acknowledge which subject's photograph quantity has not reached a prescribed quantity without having to go through the trouble of visually confirming the photograph quantity. Furthermore, if “from” and “to” have been set, the face extraction section 20a performs face extraction only on original images with image recording dates/times recorded in datetimeoriginal tags or the like which are within the range defined by “from” and “to”. This allows a photographer to arbitrarily specify at what timing images should be photographed to become targets of facial extraction, and is therefore preferable. These setting items are individually settable for each subject ID, and set items are only valid for registered facial images corresponding to each subject ID. Conditions set with this screen are related to subject IDs and stored in the EEPROM 146 or the like, and will become the conditions to which the main CPU 20 conforms when executing the various programs. Nakashima at [0156]–[0158] FIG. 10 shows an example of a camera mode selection screen. In this camera mode selection screen, buttons for specifying four types of operations, namely “display photograph count list”, “set various conditions”, “re-execute photograph count” and “cancel”, are displayed. Each menu may be selected/specified using the cross-shape key 124 or the like in the operation section to execute operations corresponding to each selected mode. “Re-execute photograph count” is a button used to give the re-execution instruction of step S4. The processing of step S4 is executed upon operation of this button. When “display photograph count list” is selected, the display control section 20f displays information stored in the photograph quantity by subject list table 75c on the liquid crystal panel 71. Nakashima at [0159] FIG. 11 is an example of a list display of the contents of the photograph quantity by subject list table 75c. As shown in FIG. 11, list information composed of a subject ID, name, photograph target flag, photograph quantity, and number of main subjects related to each other in the photograph quantity by subject list table 75c is displayed in list format on the liquid crystal panel 71. At this point, the list information may be displayed after sorting in ascending/descending order of photograph quantity per subject. This allows a photographer to easily acknowledge which subject has had fewer or more photographs taken than others, and is useful in preventing or correcting occurrences of biases among the photograph quantity to be subsequently taken for the subjects.

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	Nakashima at [0161] FIG. 12 shows a display example of individual information. For instance, in addition to specified list information (subject ID, name, photograph quantity, main shot quantity, photograph target flag), a registered facial image is displayed on this screen. A photographer may reference this screen and confirm which subject has had fewer or more photographs taken than others while looking at the faces or names of the subjects. Nakashima at [0163] A “photographed image list display” button is provided on this screen. When the “photographed image list display” button is selected, the display control section 20f displays a list of photographed images corresponding to the subject ID of the specified list information. Nakashima at [0165]–[0167] FIG. 13 shows a list display example of photographed images. In the particular example shown in FIG. 13, the display control section 20f displays photographed images which correspond to a subject ID stored in the photographed image list table 75b as a “main subject ID” among the subject IDs of the specified list information as “main shots”, and displays such “main shots” to be distinguishable from other photographed images. This allows photographed images showing the specified desired subject as a main subject to be displayed separately from the other photographed images, and enables a photographer to grasp at a glance which subject is featured as a main subject in which photographed image. Photographed images may be deleted and organized on this screen. In other words, by selecting a desired photographed image and operating a “delete” button at the top of the screen, the selected photographed image is deleted from the HDD 75 or the like. When “setting various conditions” is selected on the camera mode selection screen, a condition setting screen (refer to FIG. 8) for setting determination of eyes shut/half-open, determination of face size, and various other conditions for narrowing down the images to be displayed on the photographed image list is displayed. To the extent Maxell contends Nakashima does not disclose this limitation, a person of ordinary skill in the art would have readily arrived at this limitation by combining or modifying it in view of their general knowledge and/or the prior art references disclosed in the corresponding section of Samsung’s Invalidity Contentions.

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[13j] control the reproducer to selectively and sequentially reproduce the image information picked out based on the predetermined condition.	Nakashima discloses “control the reproducer to selectively and sequentially reproduce the image information picked out based on the predetermined condition.” See above at limitation [8i].
[16pre] 16. The recording and reproducing apparatus according to claim 13,	Nakashima discloses “[t]he recording and reproducing apparatus according to claim 13.” See above.
[16a] wherein the processing circuitry is further configured to control the reproducer to selectively and sequentially reproduce the image information picked out based on the predetermined condition in a reproducing mode set from one of a first reproducing mode and a second reproducing mode, and	Nakashima discloses “wherein the processing circuitry is further configured to control the reproducer to selectively and sequentially reproduce the image information picked out based on the predetermined condition in a reproducing mode set from one of a first reproducing mode and a second reproducing mode.” See above at limitation [11a].
[16b] wherein a reproducing time required for reproducing the image information under the first reproducing mode is shorter than a reproducing time required for reproducing the image information under the second reproducing mode, and	Nakashima discloses “wherein a reproducing time required for reproducing the image information under the first reproducing mode is shorter than a reproducing time required for reproducing the image information under the second reproducing mode.” See above at limitation [11b].
[16c] the image information reproduced under the second mode includes the image information reproduced under the first reproducing mode and other of the	Nakashima discloses “the image information reproduced under the second mode includes the image information reproduced under the first reproducing mode and other of the image information not reproduced under the first reproducing mode.” See above at limitation [11c].

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image information not reproduced under the first reproducing mode.	
[17pre] 17. The recording and reproducing apparatus according to claim 16,	Nakashima discloses “[t]he recording and reproducing apparatus according to claim 16.” See above.
[17a] wherein the processing circuitry is further configured to control the reproducer to selectively and sequentially reproduce the image information picked out based on the predetermined condition in the reproducing mode set from one of the first reproducing mode, the second reproducing mode, and a third reproducing mode, and	Nakashima discloses “wherein the processing circuitry is further configured to control the reproducer to selectively and sequentially reproduce the image information picked out based on the predetermined condition in the reproducing mode set from one of the first reproducing mode, the second reproducing mode, and a third reproducing mode.” See above at limitation [12a].
[17b] wherein a reproducing time required for reproducing the image information under the third reproducing mode is longer than the reproducing time required for reproducing the image information under the second reproducing mode.	Nakashima discloses “wherein a reproducing time required for reproducing the image information under the third reproducing mode is longer than the reproducing time required for reproducing the image information under the second reproducing mode.” See above at limitation [12b].
[18pre] 18. A recording and reproducing apparatus for recording and reproducing image information, comprising:	To the extent the preamble is limiting, Nakashima discloses “[a] recording and reproducing apparatus for recording and reproducing image information.” See above at limitation [8pre].
[18a] a photographing sensor configured to photograph an	Nakashima discloses “a photographing sensor configured to photograph an object and generate image information.” See above at limitation [8c].

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
object and generate image information;	
[18b] a recorder configured to record the image information generated by the photographing sensor in a recording medium;	Nakashima discloses “a recorder configured to record the image information generated by the photographing sensor in a recording medium.” See above at limitation [8d].
[18c] a reproducer configured to reproduce the image information recorded by the recorder;	Nakashima discloses “a reproducer configured to reproduce the image information recorded by the recorder.” See above at limitation [8f].
[18d] processing circuitry configured to:	Nakashima discloses “processing circuitry.” See above at limitation [8a].
[18e] execute a face-recognizing process on the image information generated by the photographing sensor to recognize a face;	Nakashima discloses “execute a face-recognizing process on the image information generated by the photographing sensor to recognize a face.” See above at limitation [8e].
[18f] register a person in the image information as a specific person, wherein a person with a face is obtained by newly photographing the person in a photographing mode and thereafter registered as the specific person;	Nakashima discloses “register a person in the image information as a specific person, wherein a person with a face is obtained by newly photographing the person in a photographing mode and thereafter registered as the specific person.” For example:

Nakashima at Fig. 5

FIG.5

BASIC INFORMATION REGISTRATION TABLE

SUBJECT ID	NAME	REGISTERED FACIAL IMAGE
1	TARO FUJI	image001. jpg
2	HANAKO TAKAHASHI	image002. jpg
3	JIRO SUZUKI	image003. jpg
4	KAZUKO KATO	image004. jpg
5	SABURO YAMAMOTO	image005. jpg
⋮	⋮	⋮

~75a

Nakashima at Fig. 6

FIG.6

PHOTOGRAPHED IMAGE LIST TABLE					
IMAGE FILE NAME	SUBJECT ID	MAIN SUBJECT ID	FACE SIZE		EYES INAPPROPRIATE SUBJECT ID
			INAPPROPRIATE SUBJECT ID	INAPPROPRIATE SUBJECT ID	
00000001. jpg	1, 2, 4, 5, 6	1	4	7	6
00000002. jpg	1, 2, 3, 5, 7, 8	2	5	7	6
⋮	⋮	⋮	⋮	⋮	⋮

~75b

Nakashima at Fig. 7

FIG.7

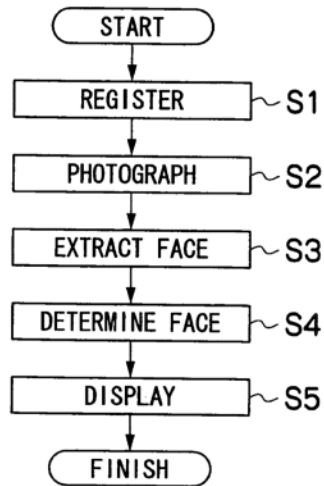
PHOTOGRAPH QUANTITY BY SUBJECT LIST TABLE

SUBJECT ID	NAME	PHOTOGRAPH TARGET	PHOTOGRAPH QUANTITY	MAIN SHOT QUANTITY
1	TARO FUJI	ON	5	2
2	HANAKO TAKAHASHI	ON	3	1
3	JIRO SUZUKI	OFF	0	0
4	KAZUKO KATO	ON	0	0
5	SHIROO TANABATO	ON	1	0
...	...	...	...	...

75c

Nakashima at Fig. 9

FIG.9



Nakashima at Fig. 10

FIG.10

FIG.10 is a menu screen with four buttons arranged vertically. The buttons are labeled: "DISPLAY PHOTOGRAPH COUNT NUMBER LIST", "SET VARIOUS CONDITIONS", "RE-EXECUTE PHOTOGRAPH COUNT (REAFFIRM)", and "CANCEL".

Nakashima at Fig. 11

FIG.11

FIG.11 is a screen displaying a table of photograph counts. The table has five columns: ID, NAME, TARGET, PHOTOGRAPH QUANTITY, and MAIN QUANTITY. Below the table are two buttons: "DISPLAY DETAILS" and "BACK".

ID	NAME	TARGET	PHOTOGRAPH QUANTITY	MAIN QUANTITY
4	KAZUKO KATO	ON	0	0
5	SABURO YAMAMOTO	ON	1	0
2	HANAKO TAKAHASHI	ON	3	1
1	TARO FUJI	ON	5	2
3	JIRO SUZUKI	OFF	0	0

Nakashima at Fig. 12

FIG.12

FACE DATA	SUBJECT ID:1
	NAME: TARO FUJI
	PHOTOGRAPH COUNT: 5
	MAIN SHOT QUANTITY: 2
	PHOTOGRAPH TARGET: ON
DISPLAY PHOTOGRAPHED IMAGE LIST	BACK

Nakashima at Fig. 13

FIG.13

MAIN SHOT:	MAIN SHOT 1	MAIN SHOT 2
OTHERS:		
OTHER 1	OTHER 2	
DELETE	BACK	

Nakashima at [0008]–[0010]

In the image capturing apparatus according to the present invention, by registering in advance a facial image of each individual intended to be a subject, the number of photographed images from which facial images matching each facial image have been extracted is calculated. Displaying this photograph quantity with a LCD and the like, or notifying the photograph quantity through audio or the like, a user may easily learn how many photographs have been taken for which subject. Therefore, it becomes possible to prevent, as much as possible, occurrences of biases among the photograph quantities of subjects, such as cases where a desired photograph quantity is not taken for certain subjects or no photographs are taken for certain subjects.

A photograph quantity corresponding to the identification information of each subject is preferably displayed at a predefined timing. “Predefined timing” means before or after start of photographing, or more specifically, upon half-pressing or full-pressing a release switch, upon setting or deactivating settings of photographing modes, or upon transition to a predefined mode for confirming a photograph quantity.

The image capturing apparatus may further comprise a main subject determination section which determines which subject is a main subject based on photographed images and extracted facial images extracted from the photographed images.

Nakashima at [0123]

Registration facial images are acquired by a photographer using the digital camera 100 by individually photographing the face of each subject. Alternatively, registration facial images may be inputted to the HDD 75 from various electronic devices such as an external server or a camera via the communication port 107. The photographer photographs a subject at a size and clarity sufficient for identifying the face of the subject, and inputs the “name” of the subject through the operation section 120. The subject management section 20e attaches a unique subject ID through the operation section 120 to the facial image, and relates the facial image to the inputted name and stores the facial image in the basic information registration table 75a. Facial images stored in the basic information registration table 75a become registered facial images. Stored contents of the basic information registration table 75a may be displayed on the liquid crystal panel 71 by performing predefined menu operations. The stored contents may also be added, changed, deleted or updated.

Nakashima at [0124]–[0130]

Referring now to FIG. 6, a photographed image list table 75b is stored in the hard disk 75. In this table, photographed images which are images obtained by fully pressing the release switch 104; subject IDs identified from the images by the face determination section 20d (in other words, identification

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	information of the subjects shown in the image); main subject IDs which are the subject IDs of main subjects in the images; “face size inappropriate subject IDs” which are subject ID for subjects photographed at a size inappropriate for viewing or printing; “eyes inappropriate (half-open) subject IDs” which are subject IDs for subjects with eyes shut or half-open; and “line of sight inappropriate subject IDs” which are subject IDs for subjects whose lines of sight are inappropriate, are related to each other and stored. Determination of which subject's subject ID should be stored in the photographed image list table as a “main subject ID”, a “face size inappropriate subject ID”, an “eyes inappropriate (half-open) subject ID” or a “line of sight inappropriate subject ID” may be either performed through software processing executed by the CPU 20, or through arbitrary operation of the operation section 120 by the user. For instance, the face determination section 20 determines whether an extracted facial image detected by the face extraction section 20a is under a predefined size (for example, an absolute threshold such as 100 by 100 pixels, or a relative threshold such as the area ratio of the extracted image to the original image) (face size determination). If the extracted facial image is under the predefined size, a subject ID corresponding to a registered facial image matching a facial image of the facial region is related to the image as a “face size inappropriate subject ID”, and stored in the photographed image list table 75b. Alternatively, the face determination section 20 stores a subject ID corresponding to a registered facial image matching a facial region in which the eyes are determined by the eyes open/shut detection section 20c to be shut and/or half-open as an eyes inappropriate (half-open) subject ID into the photographed image list table 75b. In addition, the face determination section 20 displays a list of extracted facial images detected by the face extraction section 20a onto the image display LCD 102 to have the user select an extracted facial image where the line of sight is deviated, and stores a subject ID corresponding to a registered facial image matching the selected extracted facial image as a line of sight inappropriate subject ID into the photographed image list table 75b. Alternatively, the face determination section 20 determines whether an extracted facial image is a main subject based on whether the extracted facial image was at a predefined position, such as the focus position of the AF detection section 150 or the vicinity of the center of the original image upon half-pressing of the release switch 104 (main subject determination). However, if there is only one extracted facial image, the extracted facial image is determined to be the main subject regardless of whether it is positioned at a predefined position. When an extracted facial image is determined to be the main subject, a subject ID corresponding to a registered facial image matching the extracted facial image is stored in the photographed image list table 75b as a main subject ID.

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	While the above-described face extraction section 20a, eye region detection section 20b, eye open/shut detection section 20c, face determination section 20d, subject management section 20e, and the display control section 20f are programs executed by the main CPU 20, a variation configured so that either a portion of or all of the above programs are implemented in a dedicated semiconductor integrated circuit (ASIC or Application Specific Integrated Circuit) is also possible. This variation is preferable, since it reduces the load on the main CPU 20. Nakashima at [0145] First, in step S1, a photographer who intends to photograph one or a plurality of subjects specified in advance sets the switching lever 122 to “photograph”, and individually photographs the face of each subject. For this purpose, it is preferable that the faces are photographed at clear and appropriate sizes to allow detection of the facial regions by the face detection section 20a. Each photographed facial image is displayed on the liquid crystal panel 71. The subject management section 20e accepts input of “names” of subjects through the graphical user interface (GUI), not shown, displayed on the liquid crystal panel 71. Nakashima at [0146] Next, after confirming whether a photographed facial image should be registered in the basic information registration table 75a, when a designation for registration is forwarded from the operation section 120, the subject management section 20e attaches a unique subject ID to the photographed facial image, relates the name, facial image and the subject ID inputted through the operation section 120 to each other, and stores the related information into the basic information registration table 75a. Nakashima at [0147] Facial images to be stored in the basic information registration table 75a by the subject management section 20e do not necessarily have to be images obtained based on image capturing signals of the CCD 132. As long as facial images are photographed at an appropriate size and with appropriate clarity, facial images may be, for instance, received from an external server via the communication port 107 or read out from the memory card 200. Start/finish of operation of the GUI for registering facial images may be switched back and forth by operating the operation section 120 during the photography mode. Nakashima at [0148] In step S2, photography is performed independently of facial image registration in a state where the facial image registration GUI is disabled in photography mode. An original image obtained through photography is stored in the memory card 200 or the HDD 75. Accordingly, the subject management

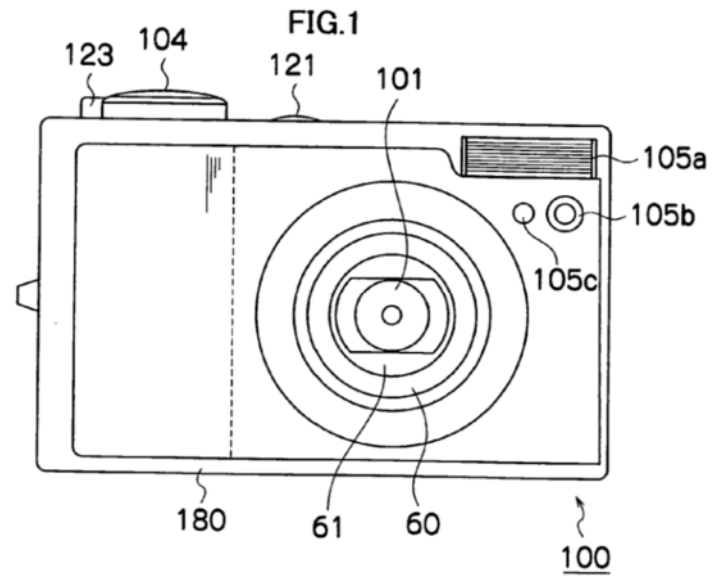
'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	section 20e adds the file name of the newly obtained photographed image to the photographed image list table 75b. Nakashima at [0149]–[0150] In step S3, the face extraction section 20a extracts a facial region (in other words, an extracted facial image) from the photographed image. In step S4, the face determination section 20d identifies a registered facial image which matches each extracted facial image from the basic information registration table 75a. Furthermore, the face determination section 20d also identifies a subject ID corresponding to the identified registered facial image. The face determination section 20d relates the identified subject ID to the file name of the original image, and adds the subject ID to the “subject ID” in the photographed image list table 75b. In other words, whenever photography is performed, identification information of the subject in the photographed image is stored into the photographed image list table 75b. Nakashima at [0156]–[0158] FIG. 10 shows an example of a camera mode selection screen. In this camera mode selection screen, buttons for specifying four types of operations, namely “display photograph count list”, “set various conditions”, “re-execute photograph count” and “cancel”, are displayed. Each menu may be selected/specified using the cross-shape key 124 or the like in the operation section to execute operations corresponding to each selected mode. “Re-execute photograph count” is a button used to give the re-execution instruction of step S4. The processing of step S4 is executed upon operation of this button. When “display photograph count list” is selected, the display control section 20f displays information stored in the photograph quantity by subject list table 75c on the liquid crystal panel 71. Nakashima at [0159] FIG. 11 is an example of a list display of the contents of the photograph quantity by subject list table 75c. As shown in FIG. 11, list information composed of a subject ID, name, photograph target flag, photograph quantity, and number of main subjects related to each other in the photograph quantity by subject list table 75c is displayed in list format on the liquid crystal panel 71. At this point, the list information may be displayed after sorting in ascending/descending order of photograph quantity per subject. This allows a photographer to easily acknowledge which subject has had fewer or more photographs taken than others, and is useful in preventing or correcting occurrences of biases among the photograph quantity to be subsequently taken for the subjects.

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	To the extent Maxell contends Nakashima does not disclose this limitation, a person of ordinary skill in the art would have readily arrived at this limitation by combining or modifying it in view of their general knowledge and/or the prior art references disclosed in the corresponding section of Samsung's Invalidity Contentions.
[18g] firstly pick out image information which includes the registered specific person,	Nakashima discloses "firstly pick out image information which includes the registered specific person." See above at limitation [13h].
[18h] secondly pick out the image information based on a predetermined condition from among the picked-out image information which includes the registered specific person, the predetermined condition being set in accordance with an instruction by a user, and	Nakashima discloses "secondly pick out the image information based on a predetermined condition from among the picked-out image information which includes the registered specific person, the predetermined condition being set in accordance with an instruction by a user." See above at limitation [13i].
[18i] control the reproducer to selectively and sequentially reproduce the image information picked out based on the predetermined condition.	Nakashima discloses "control the reproducer to selectively and sequentially reproduce the image information picked out based on the predetermined condition." See above at limitation [8i].
[19pre] 19. The recording and reproducing apparatus according to claim 18,	Nakashima discloses "[t]he recording and reproducing apparatus according to claim 18." See above.
[19a] wherein the processing circuitry is further configured to control the reproducer to selectively and sequentially reproduce the image information picked out based on the	Nakashima discloses "wherein the processing circuitry is further configured to control the reproducer to selectively and sequentially reproduce the image information picked out based on the predetermined condition in a reproducing mode set from one of a first reproducing mode and a second reproducing mode." See above at limitation [11a].

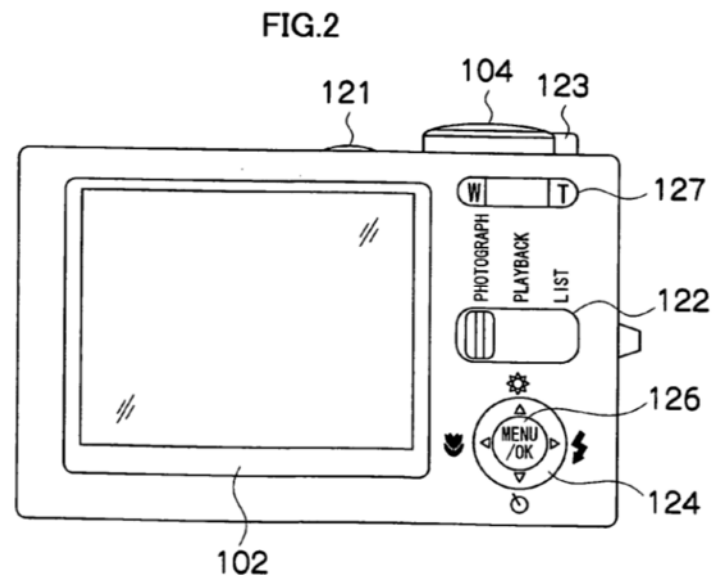
'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
predetermined condition in a reproducing mode set from one of a first reproducing mode and a second reproducing mode, and	
[19b] wherein a reproducing time required for reproducing the image information under the first reproducing mode is shorter than a reproducing time required for reproducing the image information under the second reproducing mode, and	Nakashima discloses “wherein a reproducing time required for reproducing the image information under the first reproducing mode is shorter than a reproducing time required for reproducing the image information under the second reproducing mode.” See above at limitation [11b].
[19c] the image information reproduced under the second mode includes the image information reproduced under the first reproducing mode and other of the image information not reproduced under the first reproducing mode.	Nakashima discloses “the image information reproduced under the second mode includes the image information reproduced under the first reproducing mode and other of the image information not reproduced under the first reproducing mode.” See above at limitation [11c].
[20pre] 20. The recording and reproducing apparatus according to claim 19,	Nakashima discloses “[t]he recording and reproducing apparatus according to claim 19.” See above.
[20a] wherein the processing circuitry is further configured to control the reproducer to selectively and sequentially reproduce the image information picked out based on the predetermined condition in the reproducing mode set from one of the first reproducing mode, the	Nakashima discloses “wherein the processing circuitry is further configured to control the reproducer to selectively and sequentially reproduce the image information picked out based on the predetermined condition in the reproducing mode set from one of the first reproducing mode, the second reproducing mode, and a third reproducing mode.” See above at limitation [12a].

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
second reproducing mode, and a third reproducing mode, and	
[20b] wherein a reproducing time required for reproducing the image information under the third reproducing mode is longer than the reproducing time required for reproducing the image information under the second reproducing mode.	Nakashima discloses “wherein a reproducing time required for reproducing the image information under the third reproducing mode is longer than the reproducing time required for reproducing the image information under the second reproducing mode.” See above at limitation [12b].
[84pre] 84. A recording and reproducing apparatus for recording and reproducing image information, comprising:	Nakashima discloses “[a] recording and reproducing apparatus for recording and reproducing image information.” See above at limitation [8pre].
[84a] a processor;	Nakashima discloses “a processor.” See above at limitation [8a].
[84b] a display displaying a first option and a second option, wherein when the first option is selected, the recording and reproducing apparatus enters a record mode to capture video information, and when the second option is selected, the recording and reproducing apparatus enters a reproduction mode to reproduce and display recorded video information;	Nakashima discloses “a display displaying a first option and a second option, wherein when the first option is selected, the recording and reproducing apparatus enters a record mode to capture video information, and when the second option is selected, the recording and reproducing apparatus enters a reproduction mode to reproduce and display recorded video information.” For example:

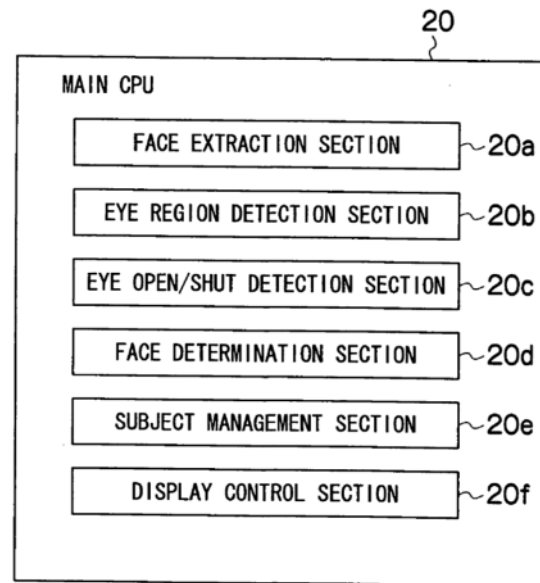
Nakashima at Fig. 1



Nakashima at Fig. 2

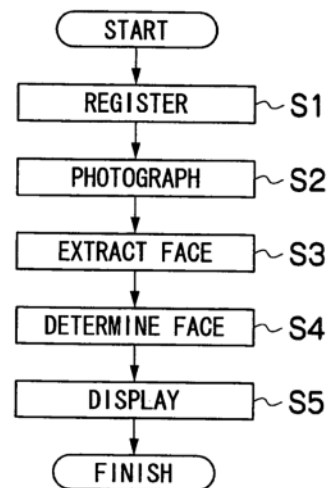


Nakashima at Fig. 4



Nakashima at Fig. 9

FIG.9



Nakashima at [0079]

An image displaying LCD 102, a switching lever 122, a cross-shaped key 124, an information position specifying key 126 and the like are also provided on the rear face of the camera 100. The cross-shaped key 124 is an operation system in which up, down, left and right respectively set display brightness adjustment/self-timer/macro photography/flash photography. Although a description will be provided later, pressing the down key of the cross-shaped key 124 enables setting of a self photographing mode, where a main CPU 20 causes a CCD 132 to perform shutter operations after conclusion of a clocking operation by a self-timer circuit 83.

Nakashima at [0080]

FIG. 3 is a block diagram of the camera 100. The camera 100 is provided with an operation section 120 which allows a user to perform various operations when using the camera 100. The operation section 120 comprises: the power switch 121 for turning on power to activate the camera 100; the switching lever 122 which allows arbitrary switching among photographing, playback, and list playback which will be described later; the mode dial 123 for selecting automatic photographing, manual photographing or the like; the cross-shaped key 124 for setting or selecting among various menus and for performing zoom; a flash activating switch 125; and the information position specifying key 126 for executing or canceling menus selected through the cross-shaped key 124.

Nakashima at [0081]

The camera 100 also comprises: the image displaying LCD 102 for displaying photographed images, playback images or the like; and an operation LCD display 103 which provides assistance for operation.

Nakashima at [0135]

Operating conditions of the programs executed by the main CPU 20 may be arbitrarily set by selecting/specifying setting items of a graphical user interface (GUI) displayed on the liquid crystal panel 71 through the operation section 120.

Nakashima at [0145]

First, in step S1, a photographer who intends to photograph one or a plurality of subjects specified in advance sets the switching lever 122 to “photograph”, and individually photographs the face of each subject. For this purpose, it is preferable that the faces are photographed at clear and appropriate sizes to allow detection of the facial regions by the face detection section 20a. Each photographed facial image is displayed on the liquid crystal panel 71. The subject management section 20e accepts input of “names” of subjects through the graphical user interface (GUI), not shown, displayed on the liquid crystal panel 71.

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	To the extent Maxell contends Nakashima does not disclose this limitation, a person of ordinary skill in the art would have readily arrived at this limitation by combining or modifying it in view of their general knowledge and/or the prior art references disclosed in the corresponding section of Samsung's Invalidity Contentions.
[84c] a memory coupled to the processor and storing instructions that, when executed by the processor, cause the processor to:	Nakashima discloses "a memory coupled to the processor and storing instructions" therefor. See above at limitation [8b].
[84c.i] capture a photograph and generate image information of the photograph;	Nakashima discloses "capture a photograph and generate image information of the photograph." See above at limitation [8c].
[84c.ii] record the image information in a recording medium;	Nakashima discloses "record the image information in a recording medium." See above at limitation [8d].
[84c.iii] execute a face-recognizing process on the image information to recognize a face;	Nakashima discloses "execute a face-recognizing process on the image information to recognize a face." See above at limitation [8e].
[84c.iv] reproduce the recorded image from the recording medium;	Nakashima discloses "reproduce the recorded image from the recording medium." See above at limitation [8f].
[84c.v] register a person in the image information as a specific person in a mode selected from a first setting mode and a second setting mode, wherein, when the first setting mode is selected, an image information of a person with a face is obtained by newly photographing the person with a face in a photographing mode and,	Nakashima discloses "register a person in the image information as a specific person in a mode selected from a first setting mode and a second setting mode, wherein, when the first setting mode is selected, an image information of a person with a face is obtained by newly photographing the person with a face in a photographing mode and, thereafter, the image information of the person with a face is used to register the person with a face as the specific person." See above at limitation [8g].

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
thereafter, the image information of the person with a face is used to register the person with a face as the specific person, and,	
[84c.vi] when the second setting mode is selected, a person with a face in an image information of a person with a face is selected from a plurality of faces in the image information recorded in the recording medium and, thereafter, the image information of the person with a face is used to register the person with a face as the specific person;	Nakashima discloses “when the second setting mode is selected, a person with a face in an image information of a person with a face is selected from a plurality of faces in the image information recorded in the recording medium and, thereafter, the image information of the person with a face is used to register the person with a face as the specific person.” See above at limitation [8h].
[84c.vii] selectively reproduce the recorded image which includes the registered specific person; and	Nakashima discloses “selectively reproduce the recorded image which includes the registered specific person.” See above at limitation [8i].
[84c.viii] generate a thumbnail corresponding to the recorded image in the recording medium such that the thumbnail is displayed on the display with an icon having a predetermined shape when an importance level is set for the recorded image via a user interface;	Nakashima discloses “generate a thumbnail corresponding to the recorded image in the recording medium such that the thumbnail is displayed on the display with an icon having a predetermined shape when an importance level is set for the recorded image via a user interface.” For example:

Nakashima at Fig. 12

FIG.12

A rectangular screen display with a thin border. Inside, on the left, is a large rectangular box labeled "FACE DATA". To the right of this box, the following text is displayed in a stacked format: "SUBJECT ID:1", "NAME: TARO FUJI", "PHOTOGRAPH COUNT: 5", "MAIN SHOT QUANTITY: 2", and "PHOTOGRAPH TARGET: ON". At the bottom of the screen, there are two rectangular buttons. The left button is labeled "DISPLAY PHOTOGRAPHED IMAGE LIST" and the right button is labeled "BACK".

Nakashima at Fig. 13

FIG.13

A rectangular screen display with a thin border. At the top left, the text "MAIN SHOT:" is followed by two rectangular buttons labeled "MAIN SHOT 1" and "MAIN SHOT 2". Below this, the text "OTHERS:" is followed by two rectangular buttons labeled "OTHER 1" and "OTHER 2", with a dotted line "....." to the right of "OTHER 2". At the bottom of the screen, there are two rectangular buttons labeled "DELETE" and "BACK".

Nakashima at [0131]–[0133]

Referring now to FIG. 7, a photograph quantity by subject list table 75c is stored in the hard disk 75. Among the images stored in the HDD 75, to all original images or desired original images specified via the operation section 120, the photograph quantity by subject list table 75c relates: “photograph quantities” which indicate the total number of original images containing an extracted facial image matching a registered facial image; “photograph targets” which are flags indicating whether an original image will be a target of face extraction by the face extraction section 20a; “main shot quantities” which are the total number of original images in which the extracted facial image is the main subject; and “subject IDs” and “names” corresponding to registered facial images matching the extracted facial images.

Counting of the photograph quantity for each subject is performed by the subject management section 20e by individually adding up the number of extracted facial images, among those extracted from the original image by the face extraction section 20a, which match a certain registered facial image for each registered image. In addition, counting of the main shot quantity for each subject is performed by the subject management section 20e by individually adding up the number of extracted facial images positioned at the focus position of the AF detection section 150 or the vicinity of the center of the original image during photography for each registered image matching the extracted facial images.

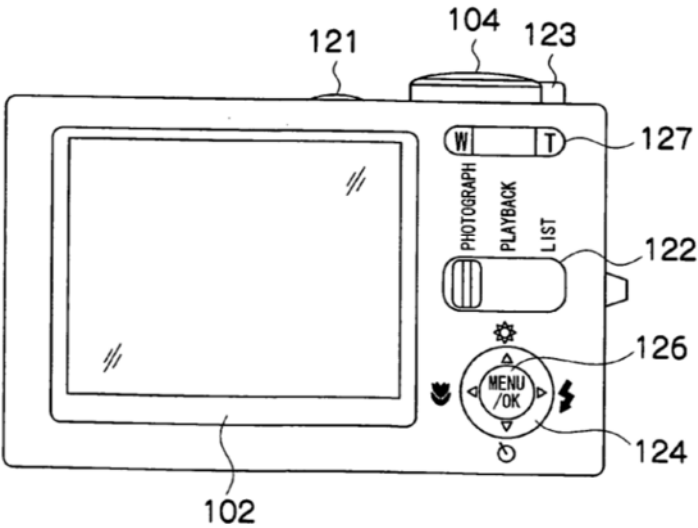
While a description will be provided later, the subject management section 20e may also be arranged to exclude original images which include extracted facial images corresponding to subject IDs stored as “face size inappropriate subject IDs”, “eyes inappropriate (half-open) subject IDs” or “line of sight inappropriate subject IDs” from the aggregate total of the photograph quantities.

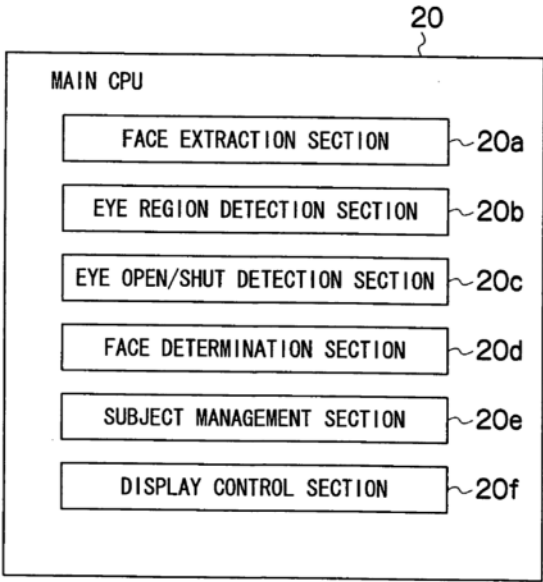
Nakashima at [0165]–[0167]

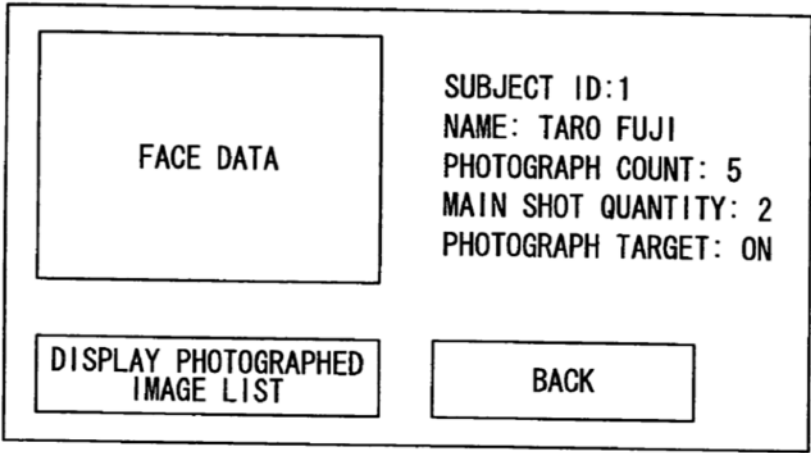
FIG. 13 shows a list display example of photographed images. In the particular example shown in FIG. 13, the display control section 20f displays photographed images which correspond to a subject ID stored in the photographed image list table 75b as a “main subject ID” among the subject IDs of the specified list information as “main shots”, and displays such “main shots” to be distinguishable from other photographed images. This allows photographed images showing the specified desired subject as a main subject to be displayed separately from the other photographed images, and enables a photographer to grasp at a glance which subject is featured as a main subject in which photographed image.

Photographed images may be deleted and organized on this screen. In other words, by selecting a desired photographed image and operating a “delete” button at the top of the screen, the selected photographed image is deleted from the HDD 75 or the like.

When “setting various conditions” is selected on the camera mode selection screen, a condition setting screen (refer to FIG. 8) for setting determination of eyes shut/half-open, determination of face size, and

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	various other conditions for narrowing down the images to be displayed on the photographed image list is displayed. To the extent Maxell contends Nakashima does not disclose this limitation, a person of ordinary skill in the art would have readily arrived at this limitation by combining or modifying it in view of their general knowledge and/or the prior art references disclosed in the corresponding section of Samsung's Invalidity Contentions.
[84d] a touch panel adhered to a screen of the display, wherein the first setting mode and the second setting mode are each selected using the touch panel;	Nakashima discloses “a touch panel adhered to a screen of the display, wherein the first setting mode and the second setting mode are each selected using the touch panel.” For example: Nakashima at Fig. 2 FIG.2 

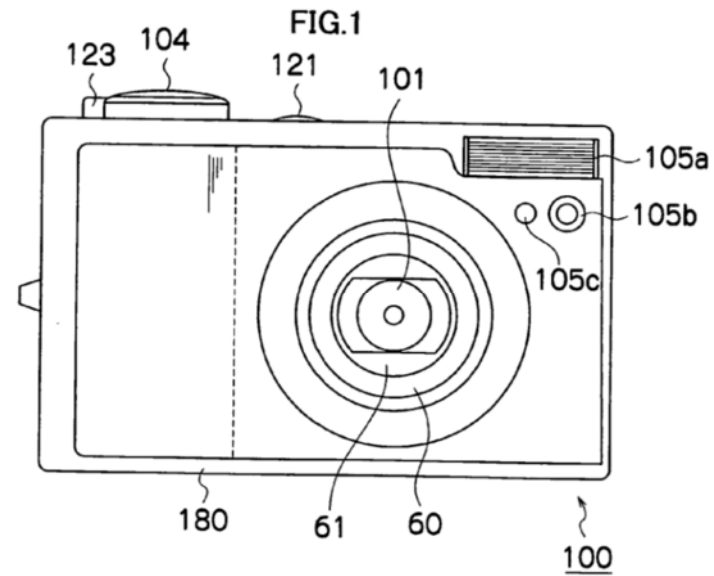
'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	Nakashima at Fig. 4  Nakashima at [0135] Operating conditions of the programs executed by the main CPU 20 may be arbitrarily set by selecting/specifying setting items of a graphical user interface (GUI) displayed on the liquid crystal panel 71 through the operation section 120. To the extent Maxell contends Nakashima does not disclose this limitation, a person of ordinary skill in the art would have readily arrived at this limitation by combining or modifying it in view of their general knowledge and/or the prior art references disclosed in the corresponding section of Samsung's Invalidity Contentions.
[84e] a video camera providing video image data, wherein, in response to the face-recognizing process recognizing that a face of a person is included in the video image data, the display displays	Nakashima discloses “a video camera providing video image data, wherein, in response to the face-recognizing process recognizing that a face of a person is included in the video image data, the display displays the video image data with a frame surrounding at least a portion of the face of the person.” For example:

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
the video image data with a frame surrounding at least a portion of the face of the person;	Nakashima at Fig. 12 FIG.12  Nakashima at [0156]–[0158] FIG. 10 shows an example of a camera mode selection screen. In this camera mode selection screen, buttons for specifying four types of operations, namely “display photograph count list”, “set various conditions”, “re-execute photograph count” and “cancel”, are displayed. Each menu may be selected/specified using the cross-shape key 124 or the like in the operation section to execute operations corresponding to each selected mode. “Re-execute photograph count” is a button used to give the re-execution instruction of step S4. The processing of step S4 is executed upon operation of this button. When “display photograph count list” is selected, the display control section 20f displays information stored in the photograph quantity by subject list table 75c on the liquid crystal panel 71. Nakashima at [0161] FIG. 12 shows a display example of individual information. For instance, in addition to specified list information (subject ID, name, photograph quantity, main shot quantity, photograph target flag), a registered facial image is displayed on this screen. A photographer may reference this screen and confirm

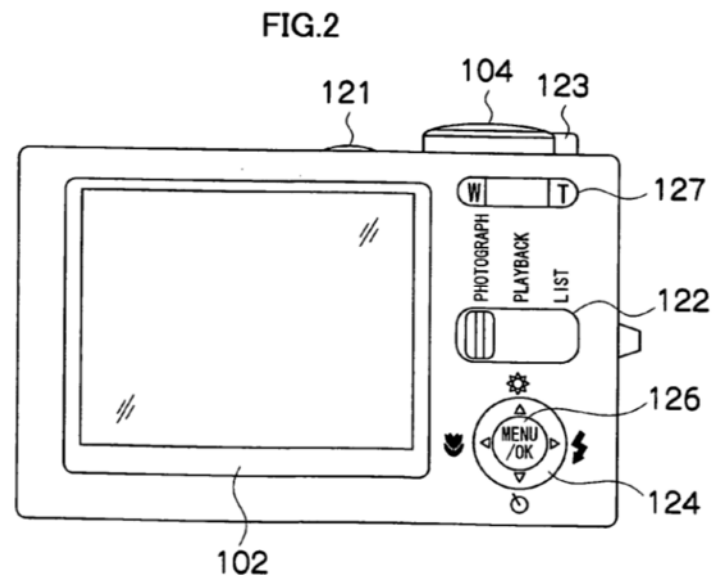
'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	In the present embodiment, the A/D conversion section 134 has a quantization resolution of 8 bits, and converts analog RGB captured image signals outputted from the white-balance/gamma processing section 133 into RGB digital image data with levels of 0 to 255 and outputs the converted data. However, the described quantization resolution is merely an example, and is not a value essential to the present invention. To the extent Maxell contends Nakashima does not disclose this limitation, a person of ordinary skill in the art would have readily arrived at this limitation by combining or modifying it in view of their general knowledge and/or the prior art references disclosed in the corresponding section of Samsung's Invalidity Contentions.
[84g] a codec for compressing the digital image signal using a predetermined compression encoding method and generating encoded image information, wherein the encoded image information is stored in the recording medium,	Nakashima discloses “a codec for compressing the digital image signal using a predetermined compression encoding method and generating encoded image information, wherein the encoded image information is stored in the recording medium.” For example: Nakashima at Fig. 3 FIG. 3

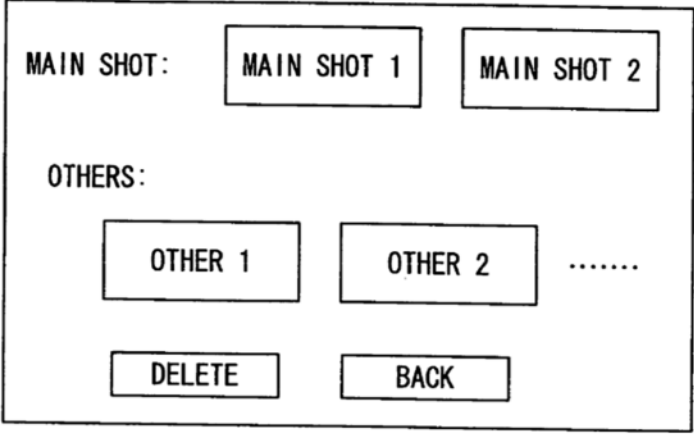
'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	Nakashima at [0106] The camera 100 is also provided with a compression/expansion/ID extracting section 143 and an I/F section 144. The compression/expansion/ID extracting section 143 reads out image data stored in the buffer memory 135 via a bus line 142 and compresses the image data, and stores the image data into a memory card 200 via the I/F section 144. In addition, when reading out image data stored in the memory card 200, the compression/expansion/ID extracting section 143 extracts an identification number (ID) unique to the memory card 200, reads out image data stored in the memory card 200 and expands the image data, and stores the image data into the buffer memory 135. Nakashima at [0107] Y/C signals stored in the buffer memory 135 are compressed by the compression/expansion/ID extracting section 143 into a predetermined format, and are then recorded to a removable media such as the memory card 200 or a built-in high-capacity storage media such as a hard disk (HDD) 75 via the I/F section 144 in a predetermined format (e.g. Exif (Exchangeable Image File Format) file). Recording of data to the hard disk (HDD) 75 or reading of data from the hard disk (HDD) 75 is controlled by a hard disk controller 74 in response to instructions from the main CPU 20. To the extent Maxell contends Nakashima does not disclose this limitation, a person of ordinary skill in the art would have readily arrived at this limitation by combining or modifying it in view of their general knowledge and/or the prior art references disclosed in the corresponding section of Samsung's Invalidity Contentions.
[84h] wherein the video camera captures video information corresponding to a scene and the processor:	Nakashima discloses “wherein the video camera captures video information corresponding to a scene and the processor.” For example:

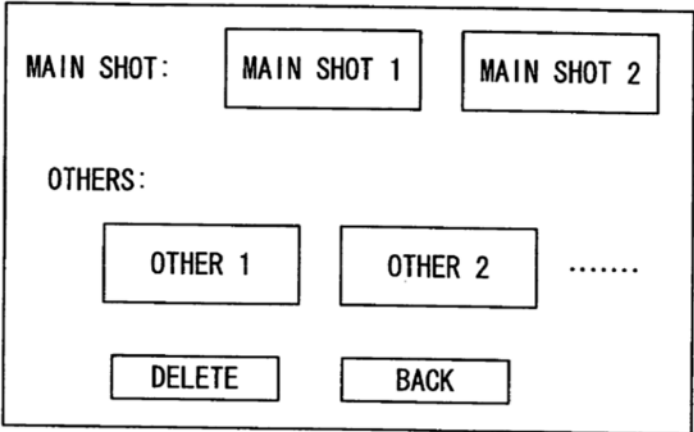
Nakashima at Fig. 1

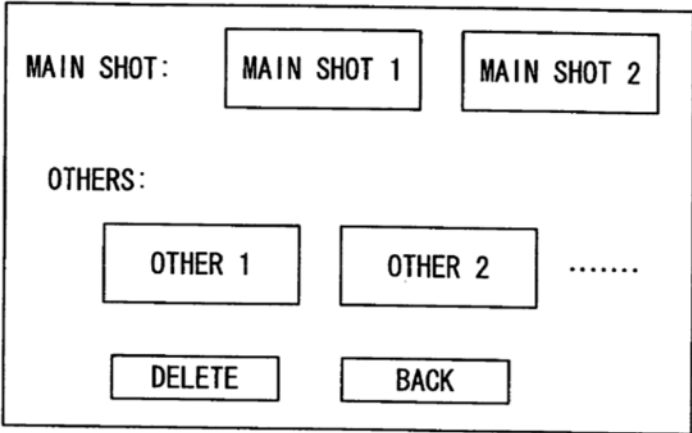


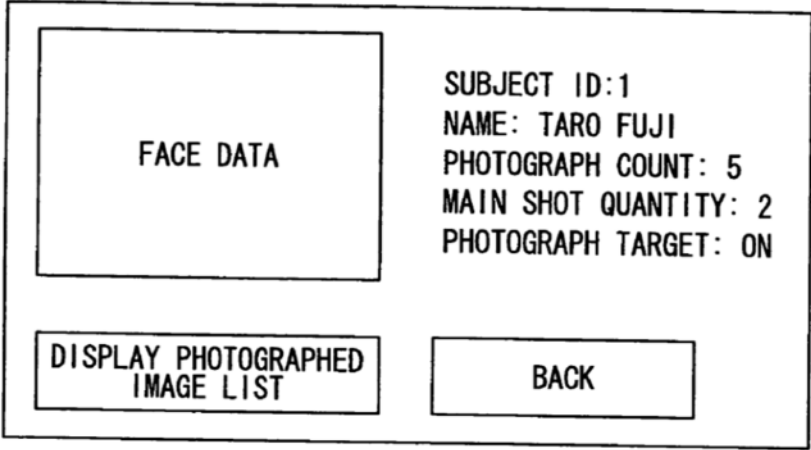
Nakashima at Fig. 2



'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	Nakashima at Fig. 13 FIG.13  To the extent Maxell contends Nakashima does not disclose this limitation, a person of ordinary skill in the art would have readily arrived at this limitation by combining or modifying it in view of their general knowledge and/or the prior art references disclosed in the corresponding section of Samsung's Invalidity Contentions.
[84h.i] automatically sets a plurality of sections corresponding to the video information of the scene; and	Nakashima discloses “automatically sets a plurality of sections corresponding to the video information of the scene.” For example:

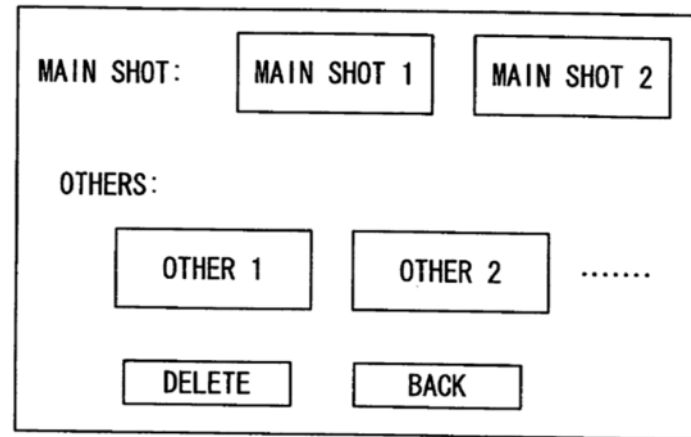
'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	Nakashima at Fig. 13 FIG.13  To the extent Maxell contends Nakashima does not disclose this limitation, a person of ordinary skill in the art would have readily arrived at this limitation by combining or modifying it in view of their general knowledge and/or the prior art references disclosed in the corresponding section of Samsung's Invalidity Contentions.
[84h.ii] generates a plurality of thumbnails corresponding to the plurality of sections, wherein each of the plurality of thumbnails is associated with the same video information corresponding to the scene, and the display displays the plurality of thumbnails; and	Nakashima discloses “generates a plurality of thumbnails corresponding to the plurality of sections, wherein each of the plurality of thumbnails is associated with the same video information corresponding to the scene, and the display displays the plurality of thumbnails.” For example:

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	Nakashima at Fig. 13 FIG.13  To the extent Maxell contends Nakashima does not disclose this limitation, a person of ordinary skill in the art would have readily arrived at this limitation by combining or modifying it in view of their general knowledge and/or the prior art references disclosed in the corresponding section of Samsung's Invalidity Contentions.
[84i] wherein the display is configured to display at least a plurality of images recorded in the recording medium such that contents of each image in the plurality of images includes a face of a different person and background objects and displaying the plurality of images includes displaying the faces without displaying all of the background	Nakashima discloses “wherein the display is configured to display at least a plurality of images recorded in the recording medium such that contents of each image in the plurality of images includes a face of a different person and background objects and displaying the plurality of images includes displaying the faces without displaying all of the background objects included in the contents of each image of the plurality of images.” For example:

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
objects included in the contents of each image of the plurality of images.	Nakashima at Fig. 12 FIG.12  <pre> graph TD subgraph FIG12 [FIG.12] FD[FACE DATA] subgraph Info [] direction TB S1[SUBJECT ID:1] N1[NAME: TARO FUJI] PC1[PHOTOGRAPH COUNT: 5] MSQ1[MAIN SHOT QUANTITY: 2] PT1[PHOTOGRAPH TARGET: ON] end subgraph Buttons [] direction LR DPL[DISPLAY PHOTOGRAPHED IMAGE LIST] B[BACK] end end </pre>

Nakashima at Fig. 13

FIG.13



Nakashima at [0156]–[0158]

FIG. 10 shows an example of a camera mode selection screen. In this camera mode selection screen, buttons for specifying four types of operations, namely “display photograph count list”, “set various conditions”, “re-execute photograph count” and “cancel”, are displayed. Each menu may be selected/specified using the cross-shape key 124 or the like in the operation section to execute operations corresponding to each selected mode.

“Re-execute photograph count” is a button used to give the re-execution instruction of step S4. The processing of step S4 is executed upon operation of this button.

When “display photograph count list” is selected, the display control section 20f displays information stored in the photograph quantity by subject list table 75c on the liquid crystal panel 71.

Nakashima at [0161]

FIG. 12 shows a display example of individual information. For instance, in addition to specified list information (subject ID, name, photograph quantity, main shot quantity, photograph target flag), a registered facial image is displayed on this screen. A photographer may reference this screen and confirm which subject has had fewer or more photographs taken than others while looking at the faces or names of the subjects.

'848 Patent Claim Limitation	Nakashima Exemplary Disclosure
	To the extent Maxell contends Nakashima does not disclose this limitation, a person of ordinary skill in the art would have readily arrived at this limitation by combining or modifying it in view of their general knowledge and/or the prior art references disclosed in the corresponding section of Samsung's Invalidity Contentions.