IMAGE REPRODUCTION APPARATUS AND IMAGE REPRODUCTION PROGRAM

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to an image reproduction apparatus and an image reproduction program for displaying a multi-image frame on a monitor screen.

[0003] 2. Description of the Related Art

[0004] Still images captured by a digital still camera, hereinafter simply referred to as images, are usually printed out on photographic papers or the like. The images can also be displayed on a monitor screen of a personal computer, which is used as an image viewer. In most cases, an image viewer software has a slide show function which automatically displays a plurality of images sequentially at specified time intervals. By using this function, the plurality of images can be viewed with a simple operation.

[0005] To view the images as a slide show, a display time of each image, that is, a frame change interval needs to be set up. For instance, to view the images, the frame change interval is set long. On the other hand, to search an intended image among a plurality of images, the frame change interval is set short. Note that it is also possible to change over the frames manually by a frame advance function.

[0006] Japanese Patent Laid-Open Publication No. 07-203373 discloses an image reproduction apparatus which displays plural images (thumbnail images) in a matrix for an image search. This image reproduction apparatus helps to perform the image search efficiently by changing the frame having plural images to a next frame having other images. Further, Japanese Patent Laid-Open Publication No. 2002-112087 discloses an image reproduction apparatus which is capable of changing over between a normal search mode and a fast search mode. In the normal search mode, each image is shifted one by one in a frame so that the earliest image is disappeared from the frame, and instead a new image is introduced. In the fast search mode, the images are changed over on a frame basis in the same manner as in Japanese Patent Laid-Open Publication No. 7-203373.

[0007] In many cases, the image viewer software has a function to change not only the frame change interval, but also the number of images displayed in one frame as described above. To search an intended image in a short time, a user needs to individually adjust the frame change interval and the number of images displayed in one frame, so as to find an optimum combination of the frame change interval and the number of images.

[0008] However, when the number of images displayed in one frame is changed, time required for viewing all the images displayed in one frame is also changed. For instance, when the number of images displayed in one frame is increased, the time required for viewing the displayed images is also increased. Accordingly, it becomes necessary to extend the frame change interval. Thus, every time the number of images displayed in one frame is changed, the frame change interval needs to be changed, and this is troublesome and inconvenient.

SUMMARY OF THE INVENTION

[0009] In view of the foregoing, an object of the present invention is to provide an apparatus and a program capable of easily adjusting a combination of the number of images displayed in one frame and a frame change interval.

[0010] In order to achieve the above and the other objects, an image reproduction apparatus according to the present invention includes an input detection section for detecting input information that designates the number of images to be displayed in one frame, an image output section for reading the designated number of images from a memory device, and arranging the images in one frame, and then outputting the arranged images to the monitor, and a frame change interval determining section for determining an interval to changeover the frames in accordance with the designated number of images.

[0011] The input detection section detects a displacement amount of an operating device which is moved from its origin point to designate the number of images. The frame change interval determining section determines the frame change interval such that a frame display rate represented by a product of the number of images and a reciprocal number of the frame change interval is increased as the displacement amount increases.

[0012] The input detection section detects a number-changing displacement amount necessary for changing the number of images displayed in one frame, and a number-fixed displacement amount within a range of which the number of images is not changed. The frame change interval determining section shortens the frame change interval when the number-fixed displacement amount is detected.

[0013] In a preferred embodiment of the present invention, a slide bar displayed on the monitor is moved in accordance with the displacement amount detected by the input detection section. The frame change interval determining section extends the frame change interval in accordance with an increase in the number of images displayed in one frame. At that time, the frame change interval determining section determines the frame change interval such that the frame display rate represented by a product of the number of images displayed in one frame and a reciprocal number of the frame change interval is kept constant.

[0014] An image reproduction program according to the present invention includes the following steps: detecting input information which designates the number of images to be displayed in one frame, determining a display period of the frame on the monitor in accordance with the designated number of images, reading the designated number of images from a memory device and arranging the images in the frame, displaying the frame with the images arranged therein on the monitor, and changing over the frames every time the display period passes.

[0015] According to the present invention, since an appropriate frame change interval is set up in response to the change of the number of images in one frame, it becomes unnecessary to independently set up the number of images and the frame change interval. Accordingly, the present invention achieves a simple data input without inputting the above two types of information. Further, the searching of the images is expedited since the images are easily viewable.

[0016] Since the displacement amount of the operating device from the origin point is detected as the input information, it becomes unnecessary to input the number of images as numeric data so that the operation is simplified. In