In photocopying, a defect that makes a region light, rather than dark, would not be detected unless documents with dark and solid regions fell over it. This is not typical of photocopied documents (for instance, solid black space is forbidden in the drawings of patents, and, since it uses lots of ink, discouraged in other documents.)

In video cameras, the detection depends on moving the camera. A fixed surveillance camera, for instance, could not apply this technique, as the scene it captures is never moved.

Automatic defect detection also applies to CCD arrays such as used in microscopes, telescopes, and video cameras. However, most of the defects in CCD arrays may be permanent manufacturing defects detectable or correctable at the factory and dynamic defects in such devices may be relatively rare.

It is important to recall that defect detection is very valuable even if it only works a portion of the time. For instance, a pit or scratch on the glass of a photocopier is a permanent defect. It will eventually be found by the variety of documents used, or by simply scanning blank pages. Finding such defects, even if it occurs weeks after the defect first occurs, is surely better than not finding them at all. It must also be born in mind that a significant advantage of this method is that it works without requiring any pristine object of calibration.

I claim:

1. A method of dynamically detecting defective regions of an image acquisition device that are corrupted by dirt or defects positionally associated with said image acquisition device comprising the steps of:

a) initializing a score target value h to a predetermined number,

b) initializing a map of potential defects P that associates with each defect the number of the image in which it was found,

c) acquiring a serially numbered image numbered q from said image acquisition device,

d) constructing a map of deviant regions from image number q that includes just those regions having at least a predetermined deviation of intensity or color from the surrounding area in said image,

e) adding each deviant region from said map of deviant regions and its image number q to P.

f) scoring each region r in said map of potential defects with a scoring function that is monotonic in positional correspondence between r and other regions P having image numbers differing from q,

g) removing from P regions obsolete relative to said scoring function,

h) detecting as defective regions just those regions that scored at least said score target value h,

i) repeating steps c through h;

whereby the operator may be alerted to the existence and position of defective regions, or said defective regions may be removed from or compensated for in the acquired images.

2. The method of claim **1** further including the step of qualifying said image numbered q by determining if substantial difference exists between said image numbered q and the most recent previously qualified image and wherein only qualified images are processed further.

3. The method of claim **1** further including the step of qualifying said image numbered q image by receiving a signal from said image acquisition device and wherein only qualified images are processed further.

4. The method of claim **1** further including the step of excluding non-sample areas from said image numbered q by means for discriminating sample-areas.

5. The method of claim **1** further including the step of designating as inactive segments of the image that contain text or graphics found by means for text segmenting and excluding inactive segments from further processing.

6. The method of claim **1** further including the step of designating as inactive those segments having at least a predetermined total deviation and excluding inactive segments from further processing.

7. The method of claim **1** further including the step of adjusting said score target value h based on the total deviation to attain a predetermined target false alarm.

8. The method of claim **1** wherein said deviant regions are limited to individual pixels.

9. The method of claim **1** further including the step of combining intersecting defective regions into non-intersecting regions before being reported.

10. The method of claim **9** wherein the scoring function counts the number of images out of the most recent n that have active segments positionally corresponding to r and that have a deviant region positionally corresponding to r, and n is a predetermined number.

11. The method of claim **10** further including the steps of:

a) qualifying said image numbered q by determining if substantial difference exists between said image numbered q and the most recent previously qualified image and wherein only qualified images are processed further,

b) excluding non-sample areas from said image numbered q by means for discriminating sample-areas,

c) designating as inactive those segments having at least a predetermined total deviation and excluding inactive segments from further processing.

12. A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform method steps for dynamically detecting defective regions of an image acquisition device that are corrupted by dirt or defects positionally associated with said image acquisition device comprising the steps of:

a) initializing a score target value h to a predetermined number,

b) initializing a map of potential defects P that associates with each defect the number of the image in which it was found,

c) acquiring a serially numbered image numbered q from said image acquisition device,

d) constructing a map of deviant regions from image number q that includes just those regions having at least a predetermined deviation of intensity or color from the surrounding area in said image,

e) adding each deviant region from said map of deviant regions and its image number q to P,

f) scoring each region r in said map of potential defects with a scoring function that is monotonic in positional correspondence between r and other regions P having image numbers differing from q,

g) removing from P regions obsolete relative to said scoring function,

h) detecting as defective regions just those regions that scored at least said score target value h,

i) repeating steps c through h;

whereby the operator may be alerted to the existence and position of defective regions, or said defective regions