example as described below and depicted in FIGs. 6A and 6B. The image sensor may be a charge coupled device (CCD) based sensor, a complementary metal oxide semiconductor (CMOS) based sensor and/or any other sensor for capturing an image of a cut stone. Optionally, the image sensor 102 is 3 mega pixel MP sensor or more. Optionally, the image sensor 102 has a replaceable lens. In such a manner, various lenses, for example macro lens 16mm, 25mm, 30mm, and/or 50mm may be selected and used based on the size of the cut stone 99. Optionally, the image sensor 102 has a controllable focus, optionally determined according to the distance of the image sensor 102 from gemstone. The distance may be manually set, extracted from the volumetric model generated below, and/or estimated using a distance detector, such as a laser based distance detector. Optionally, various focus depths are used for the same area, for example for imaging the table. The focus may be changed by a focus motor inside the lens of the image sensor 102, changing the location of the image sensor, and/or lifting the gemstone during the scan, for example using an elevating element in the holder 101. Optionally, the image sensor 102 includes a microscope image sensor which allows capturing images for minor inclusions detection.

FIG. 3 is an exemplary schematic illustration of an exemplary cut stone 99 for depicting terms used herein. The girdle 81, the pavilion 83, the crown 84, the upper table 85 and the culet 82 are depicted with respective numerals. Optionally, the image sensor ~~101~~102 includes an illumination source which is directed toward the area it images. Optionally, the image sensor 102 is placed behind a half transferable mirror and/or a white reflector to reduce reflection. Optionally, the lens of the image sensor 102 is provided with a white reflector.

The cut stone imaging system 100 further includes a computing unit 105, such as a personal computer, a laptop, a microprocessor and/or a digital signal processing (DSP) and controller 104 which controls the image sensor actuator 103. The computing unit 105 optionally hosts an image capturing module 106 which calculates motion scanning patterns for maneuvering the image sensor 102 and/or rotating the holder 101 and a reconstruction module 107 which reconstructs a volumetric image of the cut stone 99 by merging a plurality of cut stone images taken from a plurality of points of view by the image sensor 102 the cut stone 99 and/or the image sensor 102 are maneuvered. As the volumetric image is based on a plurality of images taken from a plurality of points of

WHAT IS CLAIMED IS:

1. A method of imaging a cut stone, comprising:

(a) scanning at least a part of the cut stone to obtain a first plurality of images from a first plurality of points of view relative to said part of the stone;

(b) creating a volumetric model of said part of the cut stone based on the first plurality of images;

(c) maneuvering at least one of a holder of said cut stone and at least one image sensor and capturing at least by said sensor a second plurality of images of said part of the cut stone from a second plurality of points of view, which are different from said first plurality of points of view and which have viewing directions with respect to the surface of said part of the stone, with horizontal and vertical angle differences therebetween;

(d) cropping a plurality of segments depicting said part of the cut stone from said second plurality of images using said volumetric model; and

(e) generating a volumetric image of said part of the cut stone from said plurality of segments, said volumetric image allowing a viewer to view the imaged part of the cut stone from said viewing directions.

2. The method of Claim 1, wherein during the scanning along said scanning path, the image sensor faces the girdle of the stone.

3. The method of Claim 1, wherein said scanning pattern provides for that, during said capturing, a predetermined distance is kept between said image sensor and the surface of said part of the cut stone at each of the corresponding points of view.

4. The method of Claim 3, wherein deviation from said distance is corrected during the rotation of the holder and/or the image sensor.

5. The method of Claim 1, wherein said maneuvering comprises rotating the cut stone around a first rotation axis, rotating the image sensor around a second rotation axis, the first

and second rotation axes being perpendicular to one another, the rotating of the stone and the image sensor being performed to provide the second plurality of viewing angles.

6. The method of Claim 1, wherein said volumetric image allowing a viewer to view the imaged part of the cut stone in a plurality of different planes.

7. The method of Claim 3, wherein during said capturing, the points of view are disposed on a surface of a virtual sphere around said cut stone.

8. The method of Claim 1, wherein when performing the capturing, said part of the cut stone is illuminated by homogeneous light allowing images taken from different points of view to be substantially free of brightness differences below and above the girdle.

9. The method of Claim 1, further comprising illuminating said cut stone using a light diffuser, which is sized and shaped for being placed between said cut stone and said at least one image sensor, said light diffuser having at least one slit for allowing said at least one image sensor to capture said plurality of images from said plurality of viewing angles.

10. A method of imaging a cut stone, comprising:

generating a first partial volumetric image by the method of Claim 1 with respect to a first part of the cut stone including its table and the girdle;

generating a second partial volumetric image by the method of Claim 1 with respect to a second part of said cut stone including its pavillion and the girdle;

merging said first and second partial volumetric images to generate a volumetric image of said cut stone; and

outputting said volumetric image.

11. The method of Claim 10, wherein at least the girdle's parameters in the first and second partial images is used for detecting correlation there between when performing said merging.

12. A method of imaging a cut stone, comprising:

(a) scanning at least a part of the cut stone, to obtain a first plurality of images, along scanning path such that an image sensor used for such scanning faces the girdle of the stone;

(b) creating a volumetric model of said part of the cut stone based on the first plurality of images;

(c) maneuvering a holder of said cut stone and at least one image sensor along a scanning pattern other than the scanning path so that a predetermined distance is kept between said image sensor and the surface of said part of the cut stone at each of the corresponding points of view, and capturing at least by said sensor a second plurality of images of said part of the cut stone from a second plurality of points of view;

(d) cropping a plurality of segments depicting said part of the cut stone from said second plurality of images using said volumetric model; and

(e) generating a volumetric image of said part of the cut stone from said plurality of segments, directions, said volumetric image allowing a viewer to view the imaged part of the cut stone in a plurality of different planes.

13. The method of Claim 12, wherein deviation from said distance is corrected during the rotation of the holder and/or the image sensor.

14. The method of Claim 12, wherein said maneuvering comprises rotating the cut stone around a first rotation axis, rotating the image sensor around a second rotation axis, the first and second rotation axes being perpendicular to one another, the rotating of the stone and the image sensor being performed to provide viewing directions with respect to the surface of said part of the stone, with horizontal and vertical angle differences therebetween.

15. A method of imaging a cut stone, comprising:

generating a first partial volumetric image by the method of Claim 12 with respect to a first part of the cut stone including its table and the girdle;

generating a second partial volumetric image by the method of Claim 12 with respect to a second part of said cut stone including its pavillion and the girdle;

merging said first and second partial volumetric images to generate a volumetric image of said cut stone; and

outputting said volumetric image.

16. The method of Claim 15, wherein at least the girdle's parameters in the first and second partial images is used for detecting correlation there between when performing said merging.

17. A system of imaging a cut stone, comprising:

a holder for mounting a cut stone;

at least one image sensor configured for scanning a part of the cut stone first, along a scanning path to obtain a first plurality of images of said part of the cut stone from a first plurality of viewing points; and

second, along a scanning pattern other than the scanning path, to capture a second plurality of images of said part of the cut stone from a second plurality of viewing points providing viewing directions, which have horizontal and vertical angle differences therebetween, said scanning pattern being such that a predetermined distance is kept between said image sensor and the surface of said part of the cut stone at each viewing points;

an image capturing module, which is configured to analyse said first plurality of images and to compute a volumetric model of said cut stone based thereon, to compute said scanning pattern and to crop a plurality of segments depicting said cut stone from said second plurality of images according to said volumetric model;

a controller, which is configured to instruct at least one of said holder and said sensor actuator to respectively rotate said cut stone and said image sensor according to said scanning pattern;

a reconstruction module configured to reconstruct a volumetric image of said cut stone from said plurality of segments; and

an output unit configured to output said volumetric image to allow imaging said cut stone from said second plurality of viewing points.

18. The system of Claim 17, wherein said holder is set for rotating said cut stone around a first rotation axis, said image sensor actuator being configured for rotating said image sensor around a second rotation axis, said first and second rotation axes are perpendicular to one another, said rotating of both the holder and the image sensor being configured to provide said second plurality of viewing angles.

19. The system of Claim 17, further comprising a lighting setup which illuminates said cut stone and a light diffuser which is sized and shaped for being placed between said cut stone and said at least one image sensor, said light diffuser having at least one slit for allowing said at least one image sensor to capture said plurality of images from said plurality of viewing angles.

20. The system of Claim 17, further comprises an illumination source set to be maneuvered with said at least image sensor so as to illuminate said cut stone from said plurality of viewing angles.

21. The system of Claim 17, wherein said image sensor is configured for scanning said part of the cut stone including its girdle, along said scanning path, which is such that the image sensor faces the girdle of the cut stone.