

Title of Invention:

Method, process and system of identification and certification of gemstones

5 Abstract:

The invention is a method, process and system of identifying and certifying gemstones in its original state as presented by a customer for cleaning, repair, re-setting or re-designing purposes (whether in the form of a ring or brooch or necklace or bracelet).

The Caratell certification process allows customers to recognise their own gemstone's DNA (such as its cut, colour, shape, size or measurement, internal inclusions) through visual recognition and specialized microscopic photography. The gemstone (internal and external features) are visually captured and crystallized in photographs taken using high definition optical devices.

This is to identify the gemstone inherent qualities since each gemstone has its own unique DNA similar to the human fingerprint. Thereby removing the perennial fear that most owners of gemstones have of the possibility of their gemstone being swapped or exchanged or damaged or reduced in size or quality when they leave their possession and are sent for cleaning, repair, re-setting or re-designing

25 Description

Background:

Conventionally, all current gem certificates identify the gemstone through a series of written description (in respect of their cut, colour and shape of the gemstone) and its size or measurement. Although this is helpful, it is not entirely accurate and its accuracy is dependent on the author of the description at the material time.

Many gemstones in the world can appear to have the same cut, colour, shape and even size or measurement. Therefore, when a customer gives his/her gemstone to a jeweller for assessment or repair, cleaning, resetting or re-designing, there is always a chance that it can be swapped for a lesser gemstone with the same outward appearance and clarity.

However, inside each gemstone there are internal features (referred to and known as 'inclusions') which are entirely unique and individual to each

gemstone. These inclusions are likened to the gemstones personal, unique DNA or “fingerprint”.

The current invention aims to remove the problem or perennial fear mentioned here above by detailing and photographing the most important inclusions and placing such critical information and data of the gemstone on the certificate. This is so that each customer will be able to look at their gemstone through an optical device (such as a microscope) and compare it with the Caratell certificate with the visual detailing concurrently and see for themselves that their gemstone matches the Caratell certificate exactly and there is no difference whatsoever of the actual gemstone and the photographed gemstone detailed in the Caratell certificate.

Many world-class laboratories certify gemstones by including a photograph of the gemstone being certified. None of the current certificates include magnified photographs of internal inclusions and external features.

Well-known laboratories that do gemstone certification include:

- GRS (Gem Research SwissLab www.gemresearch.ch),
- SSEF (Swiss Foundation for Gemstone Research, www.ssef.ch) and
- Gubelin (Gubelin Gem Lab, www.gubelingemlab.ch)
- GIA (Gemmological Institute of America, www.gia.edu)
- NGI (Nan Yang Gemmological Institute, www.ngi.com.sg) in Singapore

Most coloured gemstone certification mentions internal and external features in the gemstone under the heading of ‘Observations’. Some certificates will also plot such features in the form of a diagram and this is included in the certificate issued.

The most in depth certificates on the market currently are for diamonds and these do not include magnified photography of internal inclusions and external features. They will include detailing of cut, colour, size, measurements and if there is any evidence of treatment on the gemstone.

Our invention goes further to identify and crystallise such details of the gemstone (including all internal inclusions and external features) by high definition microscopic photography which captures the state of the gemstone on an “as is” basis with accuracy and precision so that the photographed gemstone is identical to the actual gemstone presented by the customer for certification by Caratell.

Our stringent checks and processes to extract the relevant details of the gemstone by qualified gemmologists combined with the addition of magnified

photography of internal inclusions and external features of the gemstone entered into our software to generate a final Caratell Certificate, gives the customer the confidence of having a more accurate detailing of their gemstone than any other certificate currently available in the world.

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The Caratell certificate goes beyond the conventional certificate where only basic information such as weight, cut style, colour, shape, size, measurements, refractive index, spectrum (if there is one) and comments on inclusions or diagrams of inclusions are shown on the certificate.

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This invention is capable of clearly identifying and showing the difference between two blue sapphires of the same size and cut since we record the gemstone on an “as is” basis with all its inherent internal inclusions and external features through magnified photography of such inclusions and/or features and these are imprinted on the Caratell certificate for any person (including the owner-customer) to verify using a microscope.

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Disclosure of the Invention

The invention include the method, process and system of detailing and capturing the external and internal features of each gemstone as seen through an optical device and is photographed using high definition optical devices to identify the gemstone inherent qualities and map out the unique DNA of the gemstone.

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All details identified, extracted and photographed are verified by a qualified gemmologist before such details and the supporting photographs in full colours are recorded/included in the Caratell certificate.

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The process and system of identifying and recording what are the key or important features of each individual gemstone are as follows:

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External features may include:

- Crystal face markings, cracks, cleavage, natural, nick, pit, and fracture surfaces of rough gem material
- Damage – fractures, scratches, chips, etch marks, sharpness of facet edges or crystal face edges
- Surface condition – lustre, perfection of polish, fissures
- Quality of cut – polishing lines/mark, facet junctions/edge and symmetry, extra facets
- Grain or texture – indication by different degrees of lustre, colour or polish

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- Detection of composite stones – joins, difference in lustre from different materials

Internal features may include:

- Solid, liquid or gas inclusions
- 5 • Zones of crystal growth or other structural features, including colour zones and layers of inclusions, striation
- Healed fractures which resemble ‘fingerprints’ within the stone
- Inclusions in characteristics shapes, such as hollow growth tubes and needle-shapes crystals
- 10 • Twin-planes revealing change in direction of crystal structure
- Internal fissures, cleavages and stress cracks
- Evidence of treatment such as dyeing, fracture filling in ruby, oiling in emerald
- Doubling effect
- 15 • Inclusions which allow us to identify synthetic stones (such a ‘flux’) and stimulants (such as join marks in a doublet) curve striation

Technical Solution

20 The invention successfully merges the hardware and software technologies (including the use of photography) to create a NEW solution to the problem of providing consumers with an accurate and precise gemstone identification and certification document.

25 In the current invention, the gemstone is firstly inspected by a qualified gemologist who extracts the basic information about the gemstone and enters such data into the System (including the weight, colour, cut style, shape, size and measurements) and inputs his/her initial diagnosis of the gemstone (whether it is natural, treated or synthetic) into the System.

Next, information on the gemstone such as transparency, specific gravity, refractive index is collected and entered into the System.

30 Thereafter the gemstone is viewed through the spectroscope to see if it presents a “diagnostic spectrum” and if so, this is also added to the System that will generate a certificate with the relevant information and details. A second microscopic review of the gemstone is made to confirm/verify the identity of the gemstone and the location of each inclusion.

35 At least two main inclusions are photographed through the microscope device and the external appearance/look of the gemstone is photographed without

the microscope device to record the actual “as is” appearance of the gemstone.

5 Photographs of the magnified inclusions will indicate the original colour of the inclusions and the location of the inclusions so that reference can be easily made and protection against claims of similarity of gemstones is further increased.

10 The certificate will also indicate the number of times the inclusions have been magnified to allow for more accurate viewing of each inclusion.

15 All such information shall be captured into the System and the software programme then analyses all data before the System generates and prints a certificate with the relevant details and magnified photograph(s) of the internal inclusions and magnified external feature(s) of the gemstone.

The qualified resident gemmologist signs on the Caratell certificate to authenticate the detailed data/information as shown on the certificate.

20 In the event that the Caratell certificate is checked by an external gemmologist who does a re-testing of the gemstone in his/her laboratory (as needed), any difference in his/her findings may be rectified by cross checking of the difference in the findings by a Caratell resident gemmologist before an order for a re-printing and re-signing of the Caratell certificate by Caratell’s
25 resident gemmologist, with a countersigning by the external gemmologist of the rectified certificate. Only then, will the Caratell certificate be deemed ready for the customer.

30 The signatures on the Caratell certificate shall be done in two different coloured pens, one black, and one blue. There will be a blind emboss of the Caratell stamp on the certificate proper with all the relevant information and photographs taken of the gemstone.

35 Alternative use of this invention includes but is not limited to coloured gemstones; it can be used for all types of precious stones.

It is to be appreciated that numerous modifications and variations of the invention (including generating of e-Certificates) have been contemplated as would be obvious to one of ordinary skill in the art.

40 Accordingly, it is intended to embrace all such modifications and variations as falling within the scope of the invention.