To date, the art has failed to provide a solution to the above-mentioned drawbacks. It is therefore clear that it would be highly advantageous to provide a system free from the disadvantages described above.

Aspects of the present disclosure seek to provide an optical system that overcomes the drawbacks of the prior art.

Aspects of the present disclosure also seek to provide an optical system free from the need to use two moving optical elements.

Aspects of the present disclosure further seek to provide an optical imaging system which is compact, efficient and simple to ensemble.

Other objects and advantages of the invention will become apparent as the description proceeds.

**Summary of the Invention**

An aspect of the present disclosure provides an optical imaging system comprising a scanning mirror capable of bi-axial movement, which is parallel to the ground wherefrom an image is to be acquired, and a total inner reflection (TIR) prism comprising two triangular prisms separated by an optical coating, wherein one of said two triangular prisms is shaped as an isosceles triangle, wherein the scanning mirror is positioned above the TIR prism.

Another aspect of the present disclosure provides an image scanning apparatus, comprising:

(a) a bi-axial scanning mirror positioned substantially parallel to an image source surface, configured to reflect said image to an optical sensor; and

(b) a total inner reflection (TIR) prism module located between said surface and said mirror, comprising two triangular prisms separated by an optical coating, wherein one of said two triangular prisms is shaped as an isosceles triangle.

There is also disclosed a total inner reflection (TIR) prism comprising two essentially triangular prisms separated by an optical coating or by a thin layer of air, wherein one of said two triangular prisms is shaped as an equilateral triangle. In one embodiment of the invention the TIR angle is of the order of 40°.

**Claims**

1. An optical imaging system comprising a scanning mirror capable of bi-axial movement, which is parallel to the ground wherefrom an image is to be acquired, and

   a total inner reflection (TIR) prism comprising two triangular prisms separated by an optical coating, wherein one of said two triangular prisms is shaped as an isosceles triangle, wherein the scanning mirror is positioned above the TIR prism.

2. The optical imaging system of claim 1, wherein the TIR prism is configured to transmit light to an optical lenses assembly configured to transmit the light to a sensor.

3. The optical imaging system of claim 2, comprising additional mirrors suitable to transmit light to and from the optical lenses assembly.

4. The optical imaging system of claim 1, which is adapted to simultaneously allow the passage of light of different wavelengths, selected from visible light, infrared light, and laser.

5. The optical imaging system of claim 1, wherein the scanning mirror has an angle of up to 20° from a scanning object, and wherein any distortion resulting from said angle is corrected using image processing means.

6. The optical imaging system of claim 1, further comprising image processing apparatus suitable to correct a distortion in an acquired image resulted from an angle of the scanning mirror.

7. An image scanning apparatus, comprising:

   (a) a bi-axial scanning mirror positioned substantially parallel to an image source surface, configured to reflect said image to an optical sensor; and

   (b) a total inner reflection (TIR) prism module located between said surface and said mirror, comprising two triangular prisms separated by an optical coating, wherein one of said two triangular prisms is shaped as an isosceles triangle.

8. The image scanning apparatus of claim 7,

   wherein said bi-axial mirror comprises a scanning mirror configured to perform continuous scanning movement in both yaw and pitch axes to direct light originating from different portions of a scene through the TIR prism to form captured images on a digital image sensor.

9. The image scanning apparatus of claim 7, wherein the bi-axial mirror is positioned to receive light traveling from the scene before said light enters the TIR prism.

10. The image scanning apparatus of claim 7, wherein light from the scene leaving the TIR prism reaches an optical lenses assembly from which it is focused onto the digital image sensor and wherein the digital sensor is configured to capture digital images of the scene.

11. The image scanning apparatus of claim 7, comprising mirrors suitable to transmit light to and from the optical lenses assembly.

12. The image scanning apparatus of claim 7, which is adapted to simultaneously allow the passage of light of different wavelengths, selected from visible light, infrared light and laser.

13. The image scanning apparatus of claim 7, wherein the scanning mirror is parallel to the scene wherefrom an image is to be acquired and is oriented such that its reflective surface is perpendicular to a vertical optical axis extending between the scene and the system, enabling the scanning mirror to receive light from the scene below and direct it through the TIR prism.

14. The image scanning apparatus of claim 7, wherein the bi-axial mirror has an angle of up to 20° from its perpendicular orientation to the vertical optical axis, and wherein any distortion resulting from said angle is corrected using image processing means.

15. The image scanning apparatus of claim 14, further comprising image processing apparatus suitable to correct a distortion in an acquired image resulted from an angle of the scanning mirror.