CLAIMS

What is claimed is:

~~1. A timepiece comprising:~~

~~a dial;~~

~~at least one hand mounted on the timepiece and having an upper side and a lower side facing the dial; and~~

~~a security material arranged on the lower side of the at least one hand.~~

~~2. A timepiece according to claim 1,~~

~~wherein the security material includes a medium containing one or more compounds having luminescent properties.~~

~~3. A timepiece according to claim 2, wherein the luminescent properties are in the infrared (IR) range of the electromagnetic spectrum.~~

~~4. A timepiece according to claim 2, wherein the luminescent properties are in the ultraviolet (UV) range of the electromagnetic spectrum.~~

~~5. The timepiece according to claim 3, wherein the IR range of the electromagnetic spectrum is between approximately 700 to 1600 nm.~~

~~6. The timepiece according to claim 3, wherein the IR range of the electromagnetic spectrum is between approximately 900 to 1100 nm.~~

~~7. The timepiece according to claim 3, wherein the IR range of the electromagnetic spectrum is between approximately 925 to 990 nm.~~

~~8. The timepiece according to any preceding claim , wherein the security material has one or more detectable decay time properties.~~

~~9. The timepiece according to any preceding claim, wherein the medium contains a plurality of different compounds having a respective plurality of different decay time properties.~~

~~10. The timepiece according to any preceding claim, wherein the security material contains at least three different compounds having three different decay time properties.~~

~~11. The timepiece according to any preceding claim, wherein the one or more compounds are present in the security material with a concentration of 1% to 20 % by weight with respect to a total composition.~~

~~12. The timepiece according to any preceding claim, wherein the one or more compounds are selected from one or more of the group of lanthanide derivatives.~~

~~13. The timepiece according to claim 12, wherein the one or more compounds are selected from one or more of Eu and Tb derivatives.~~

~~14. The timepiece according to claim 13, wherein the one or more of the Eu and Tb derivatives are included in an Yttrium Oxide matrix.~~

~~15. The timepiece according to claim 12, wherein the one or more compounds of the group of lanthanide derivatives are included in an Yttrium Oxide matrix.~~

~~16. The timepiece according to claim 2, wherein a decay time of the one or more compounds is between approximately 50 µs and 10 ms.~~

~~17. The timepiece according to any preceding claim, wherein the dial comprises reflection properties in the IR range of the electromagnetic spectrum.~~

~~18. The timepiece according to claim 17, wherein the reflection properties comprise a reflectivity of more than 10% in at least part of the 750 nm to 1500 nm range.~~

~~19. The timepiece according to any preceding claim, further comprising an additional layer arranged on the dial that enhances reflectivity properties of the dial in the IR range.~~

~~20. The timepiece according to claim 19, wherein the additional layer comprises one or more of indium tin oxide (ITO), an interference pigment, a dielectric multilayer coating, a cholesteric liquid crystal pigment, and a cholesteric liquid crystal coating.~~

~~21. The timepiece according to claim 19 or claim 20, wherein the additional layer is invisible to the unaided naked eye.~~

~~22. The timepiece according to any one of claims 19 to 21, wherein the additional layer has a specific reflectivity which is correlated with the properties of the security material to validate the combination of the additional layer and the security material.~~

~~23. The timepiece according to any preceding claim, wherein the dial comprises a material to enhance reflectivity properties of the dial in the IR range.~~

~~24. The timepiece according to any preceding claim, wherein the security material is configured to produce an emission luminescence upon receiving an excitation light, and a reflection band of the dial overlaps, at least in part, with the wavelength regions of both the excitation light and the emission luminescence.~~

~~25. The timepiece according to claim 24, wherein at least one of the at least one hand is completely opaque in the wavelength regions of both the excitation light and the emission luminescence.~~

~~26. The timepiece according to claim 24, wherein at least one of the at least one hand is partially transparent or translucent in the wavelength regions of both the excitation light and the emission luminescence.~~

~~27. The timepiece according to claim 26, wherein at least some of the excitation light and/or emission light passes through at least one of the one or more partially transparent or translucent hands.~~

~~28. The timepiece according to any preceding claim, wherein at least one of the at least one hand has one or more holes therein.~~

~~29. The timepiece according to claim 28, wherein at least some of the excitation light and/or emission light passes through at least one of the one or more holes.~~

~~30.~~1. A method for at least one of reading and validating a timepiece comprising a dial, at least one hand mounted on the timepiece and having an upper side and a lower side facing the dial, and a security material arranged on the lower side of the at least one hand~~,~~, the method comprising:

illuminating the security material for a prescribed amount of time via a reflection on the dial to excite the security material; and

measuring a luminescence emitted by the security material.~~,~~

~~31.~~2. The method according to claim ~~30~~ 1 wherein the security material includes a medium containing one or more compounds having luminescent properties.

~~32.~~3. The method according to claim ~~30~~ 1 or claim ~~31~~2, wherein the luminescence is at least partially reflected by the dial of the timepiece.

~~33.~~4. The method according to claim ~~30~~1, claim ~~31~~ 2 or claim ~~32~~3, wherein the luminescence is measured to determine one or more decay times of the security material and a time-dependence of the luminescence, and preferably wherein the validating further comprises comparing the time-dependence of the luminescence with at least one of one or more known reference decay times and one or more luminescence time-dependencies.

~~34. The method according toany one of claims 30 to 33, wherein the validating further comprises comparing the time-dependence of the luminescence with at least one of one or more known reference decay times and one or more luminescence time-dependencies.~~

~~35.~~5. The method according to any one of claims ~~30~~ 1 to ~~34~~4, wherein an excitation light of the security material has a prescribed wavelength range.

~~36.~~6. The method according to claim ~~35~~5, wherein the prescribed wavelength is between approximately 925 and 990 nm or wherein the prescribed wavelength is between 200nm and 400nm.

~~37. The method according to claim 35, wherein the prescribed wavelength is between 200nm and 400nm.~~

~~38. The method according to any one of claims 30 to 37, wherein the timepiece additionally includes transparent cover, and wherein the method further comprises projecting the excitation light through the transparent cover.~~

~~39.~~7. The method according to any ~~one of claims 30 to 38~~preceding claim, further comprising issuing a signal indicating one of authenticity of the timepiece and non-authenticity of the timepiece and preferably wherein the signal comprises at least one of a visual and an acoustic signal, an alert, a hold signal, an alarm, and a notification.

~~40. The method according to claim 35, wherein the signal comprises at least one of a visual and an acoustic signal.~~

~~41. The method according to claim 39 or claim 40, wherein the signal comprises at least one of: an alert, a hold signal, an alarm, and a notification.~~

~~42.~~8. A system for at least one of reading and validating a timepiece according to the method of any one of claims 1 to 7, the system comprising:

~~a dial, at least one hand mounted on the timepiece and having an upper side and a lower side facing the dial, and a security material arranged on the lower side of the at least one hand, , the method comprising:~~

a light for illuminating the security material for a prescribed amount of time via a reflection on the dial to excite the security material; and

a detector configured for measuring a luminescence emitted by the security material.

~~43. The system according to claim 42, wherein the security material includes a medium containing one or more compounds having luminescent properties.~~

~~44. The system according to claim 42 and claim 43, wherein the luminescence is at least partially reflected by the dial of the timepiece.~~

~~45. The system according to claim 42, claim 43 or claim 44, wherein the luminescence is measured at two or more different times after the illuminating to determine one or more decay times of the security material and time-dependence of the luminescence.~~

~~46.~~9. The system ~~of claim according to any one of claims 42 to 45~~according to claim 8, further comprising a comparator configured for comparing the time-dependence of the luminescence with at least one of:

one or more known reference decay times, and

one or more luminescence time-dependencies.

~~47. The system according to any one of claims 40 to 46, , wherein an excitation light of the security material has a prescribed wavelength range.~~

~~48. The system according to claim 47 , wherein the prescribed wavelength is between approximately 925 to 990 nm.~~

~~49. The system according to claim 48, wherein the prescribed wavelength is between 200 nm and 400 nm.~~

~~50.~~10. A computer readable medium for storing instructions, which, upon being executed by a processor of a computer device, cause the processor to execute a method according to any one of claims 1 to 7.~~for at least one of measuring and validating a timepiece comprising a dial, at least one hand mounted on the timepiece and having an upper side and a lower side facing the dial, and a security material arranged on the lower side of the at least one hand, the method comprising:~~

~~illuminating the security material for a prescribed amount of time via a reflection on the dial to excite the security material;~~

~~measuring a luminescence emitted by the security material.~~

~~51. The computer readable medium of claim 50, wherein the security material includes a medium containing one or more compounds having luminescent properties.~~

~~52. The computer readable medium of claim 50 or claim 51, wherein the luminescence is measured at two or more different times after the illuminating to determine one or more decay times of the security material and time-dependence of the luminescence.~~

~~53. The computer readable medium of claim 50, claim 51 or claim 52, wherein the luminescence is at least partially reflected by the dial of the timepiece.~~

~~54. The computer readable medium of any one of claims 50 to 53, wherein the method further comprises comparing the time-dependence of the luminescence with at least one of one or more known reference decay times and one or more luminescence time-dependencies.~~

~~55. The computer readable medium according to any one of claims 50 to 54, wherein an excitation light of the security material has a prescribed wavelength range.~~

~~56. The computer readable medium according to claim 55, wherein the prescribed wavelength is between approximately 925 and 990 nm.~~

~~57. The computer readable medium according to claim 56, wherein the prescribed wavelength is between 200 nm and 400 nm.~~

~~58. A hand for a timepiece, comprising:~~

~~an upper side and a lower side structured and arranged to face a dial of the timepiece; and~~

~~a security material arranged on the lower side of the hand.~~

~~59. A hand for a timepiece according to claim 58, wherein the security material includes a medium containing one or more compounds having luminescent properties.~~

~~60. A hand for a timepiece according to claim 59, wherein the luminescent properties are in the infrared (IR) range of the electromagnetic spectrum.~~

~~61. A hand for a time piece according claim 59, wherein the luminescent properties are in the ultraviolet (UV) range of the electromagnetic spectrum.~~

~~62.~~11. A timepiece, comprising:

a dial;

at least one hand mounted on the timepiece and having an upper side and a lower side facing the dial; and

a luminescent security material arranged only on the lower side of the at least one hand, wherein the security material is not visible from the upper side.

~~wherein the security material includes a medium containing one or more compounds having luminescent properties in the infrared (IR) range of the electromagnetic spectrum, wherein the security material has one or more detectable decay time properties,~~

~~wherein the IR range of the electromagnetic spectrum is between approximately 700 to 1600 nm, wherein the one or more compounds are present in the security material with a concentration of 1% to 20 % by weight with respect to a total composition,~~

~~wherein the one or more compounds are selected from one or more of the group of lanthanide derivatives,~~

~~wherein a decay time of the one or more compounds is between approximately 30 µs and 10 ms,~~

~~wherein the dial comprises reflection properties in the IR range of the electromagnetic spectrum, and~~

~~wherein the reflection properties comprise a reflectivity of more than 10% in at least part the 750 nm to 1500 nm range.~~

~~63. The timepiece according to claim 62, further comprising an additional layer arranged on the dial that enhances reflectivity properties of the dial in the IR range, wherein the additional layer comprises one or more of ITO, an interference pigment, a dielectric multilayer coating, a cholesteric liquid crystal pigment, and a cholesteric liquid crystal coating, wherein the additional layer is invisible to the unaided naked eye, wherein the additional layer has a specific reflectivity which is correlated with the properties of the security material to validate the combination of the additional layer and the security material.~~

~~64.~~12. The timepiece according to claim ~~62 or claim 63~~11, wherein the dial comprises ~~a material to enhance reflectivity~~reflection properties ~~of the dial~~ in the IR range of the electromagnetic spectrum, and preferably, wherein the reflection properties of the dial comprise a reflectivity of more than 10% in at least part of the 750 nm to 1500 nm range.

~~65.~~13. The timepiece according to any ~~one of claims 1 to 29 or claims 62 to 64~~preceding claim, further comprising an additional layer arranged on the dial that enhances reflectivity properties of the dial in the IR range.~~, wherein the at least one hand comprises two hands, wherein the two hands comprise different security materials having different luminescent properties.~~

~~66.~~14. The timepiece according to claim 13, wherein the additional layer arranged on the dial comprises one or more of indium tin oxide (ITO), an interference pigment, a dielectric multilayer coating, a cholesteric liquid crystal pigment, and a cholesteric liquid crystal coating ~~any one of claims 62 to 65, wherein the security material is configured to produce an emission luminescence upon receiving an excitation light, and a reflection band of the dial at least partially overlaps with the wavelength regions of both the excitation light and the emission luminescence~~.

15. The timepiece according to claim 13 or claim 14, wherein the additional layer is invisible to the unaided naked eye.

16. The timepiece according to any one of claims 11 to 14, wherein the additional layer arranged on the dial has a specific reflectivity which is correlated with the properties of the security material to validate the combination of the additional layer and the security material.