Multipart Coin Blank and Coin

BACKGROUND

The present application relates to a multipart coin blank that includes an inner portion and one or more outer portions surrounding the inner portion. The inner portion and the outer portions are connected to each other in a force-locked manner. The application further relates to a multipart coin.

Description of Related Art

Bimetallic coins have been increasingly brought into circulation as currency coins. The introduction of bimetallic coins eases identification of and distinction between coins having similar size, form and weight, but different face values. Bimetallic coins improve protection against accidental or intentional misuse of wrong coins. During the passage of a coin through a coin-operated machine, actual inductive and electromagnetic parameter values of the coin are compared with nominal parameter values of materials and material combinations used for coins having certain face values. For a bimetallic coin formed from a disc and a ring surrounding the disc, the inspection is performed for both materials, i.e. actual characteristic parameter values of both the ring and the disc are tapped and compared with nominal characteristic parameter values stored in the coin-operated machine. This allows for the reliable identification of coins according to a given face value and distinction from foreign coins and imitations.

Embodiments of the invention provide a coin blank increasing the reliability of identification of coins of different currencies and face values.

SUMMARY

According to a first aspect of the present invention, there is provided a coin blank comprising an inner portion, an outer portion surrounding the inner portion, and a dielectric isolation layer between the inner portion and the outer portion, wherein the isolation layer connects the inner portion and the outer portion in a force-locking manner, is transparent in a first wavelength range, and attenuates incident light in a second wavelength range, wherein a width w of the dielectric isolation layer is selected depending from a diameter DC of the coin blank and a diameter of the inner portion in order to provide a separation of inductive signatures of the inner portion and the outer portion, wherein the coin diameter DC ranges from 19 mm to 33 mm and a ratio of a diameter of the inner portion to the coin diameter ranges between 50 % and 70 %, a width w of the isolation layer satisfies

$$(DC - 19\,mm) \cdot 0.1 + 0.5\,mm \leq w \leq (DC - 19\,mm) \cdot 0.2 + 0.5\,mm .$$

According to a second aspect of the present invention, there is provided a coin or a medal comprising the above coin blank and a stamping on at least one side of at least one of the inner portion and the outer portion.

According to a third aspect of the present invention, there is provided use of the above coin with a photosensor operating in the second wavelength range.

According to a fourth aspect of the present invention, there is provided use of the above coin, wherein the photosensor also operates in the first wavelength range.

According to a fifth aspect of the present invention, there is provided coin blank comprising: an inner portion, an outer portion surrounding the inner portion, and a dielectric isolation layer between the inner portion and the outer portion, the isolation layer connecting the inner portion and the outer portion in a force-locking manner, wherein the dielectric isolation layer is transparent in a first visible wavelength range, and attenuates incident light in a second visible wavelength range.

The described embodiments, together with further advantages, will be best understood by reference to the following detailed description taken in conjunction with the accompanying drawings. The elements of the drawings are not necessarily to scale relative to each other.

CLAIMS

1. A coin blank comprising:

an inner portion,

an outer portion surrounding the inner portion, and

a dielectric isolation layer between the inner portion and the outer portion, wherein the isolation layer connects the inner portion and the outer portion in a force-locking manner, is transparent in a first wavelength range, and attenuates incident light in a second wavelength range, wherein the second wavelength range is different from the UV range,

wherein a width w of the dielectric isolation layer is selected depending from a diameter DC of the coin blank and a diameter of the inner portion in order to provide a separation of inductive signatures of the inner portion and the outer portion,

wherein the coin diameter DC ranges from 19 mm to 33 mm and a ratio of a diameter of the inner portion to the coin diameter ranges between 50 % and 70 %, a width w of the isolation layer satisfies

$$(DC - 19\,mm) \cdot 0.1 + 0.5\,mm \leq w \leq (DC - 19\,mm) \cdot 0.2 + 0.5\,mm.$$

2. The coin blank according to claim 1, wherein

the first wavelength range is a visible wavelength range.

3. The coin according to claim 1, wherein

a material of the isolation layer is transparent for a visible wavelength range and a wavelength range outside the visible wavelength range.

4. The coin blank according to claim 1, wherein

the second wavelength range is outside a visible wavelength range.

5. The coin blank according to claim 1, wherein

the second wavelength range includes a wavelength range from 700 nm to 1100 nm.

6. The coin blank according to claim 1, wherein

the first wavelength range includes a wavelength range from 400 nm to 700 nm.

7. The coin blank according to claim 1, wherein

the isolation layer is based on a transparent polymer and contains additives absorbing light in the near infrared range.

8. The coin blank according to claim 7, wherein

the additive includes particles of a metal oxide.

9. The coin blank according to claim 7, wherein

the additive is a conductive polymer selected from a group consisting of polythiophene and lanthanide bisphthalo cyanine.

10. The coin blank according to claim 7, wherein

the additive is an organic compound containing metal complexes absorbing in the near infrared range.

11. The coin blank according to claim 7, wherein

the transparent polymer is selected from a group consisting of polysulphone and polyether ether ketone.

12. The coin blank according to claim 1, wherein

with an electric conductivity CI of the inner portion and an electric conductivity CO of the outer portion , a width w of the isolation layer satisfies

$$w \geq 0{,}50 \text{ mm if } CO > CI \text{ or } (CO = CI \text{ and } CO,\ CI \geq 10\% \text{ IACS})$$

or

$$w \geq 1{,}00 \text{ mm if } CO < CI \text{ or}(CO = CI \text{ and } CO,\ CI < 10\% \text{ IACS})$$

13. A coin or a medal comprising the coin blank of any of the preceding claims and a stamping on at least one side of at least one of the inner portion and the outer portion.

14. Use of a coin according to claim 13 with a photosensor operating in the second wavelength range.

15. Use according to claim 14, wherein the photosensor also operates in the first wavelength range.

16. A coin blank comprising:

an inner portion,

an outer portion surrounding the inner portion, and

a dielectric isolation layer between the inner portion and the outer portion, the isolation layer connecting the inner portion and the outer portion in a force-locking manner, wherein the dielectric isolation layer is transparent in a first visible wavelength range, and attenuates incident light in a second visible wavelength range.