## CLAIMS

1. Device for the selective carbonization of at least a part of a surface of a paper object, more particularly of a sheet of paper, comprising:

- receiving means for receiving the paper object;

- at least one laser for selectively heating one or more parts of the surface of said paper object to a level wherein the heated part of said surface at least partly carbonizes and thereby changes color; and

- control means for controlling the laser~~.~~;

**characterized in that** said device comprises a substantially transparent cover that is arranged between said laser and at least a to be heated part of said paper object.

~~2. Device according to claim 1, wherein said control means are configured for adjusting the power of said laser and/or selectively switching the laser on and off.~~

3~~2~~. Device according to claim 1 ~~or 2~~, wherein the laser beam of said laser is reflected via a mirror towards a focus lens configured for focusing said laser beam on said paper object.

4~~3~~. Device according to claim 3~~2~~, wherein the mirror is moveable, and wherein the movement of said mirror is controllable by said control means.

~~5. Device according to any of the foregoing claims, wherein the receiving means are configured for moving the paper object relative to the laser beam.~~

~~6. Device according to any of the foregoing claims, wherein a substantially transparent cover is arranged between said laser and at least a to be heated part of said paper object.~~

7~~4~~. Device according to any of the foregoing claims ~~6~~, comprising pressing means for pressing the substantially transparent cover on at least the to be heated part of said paper object, wherein said transparent cover defines a pressing element.

8~~5~~. Device according to claim ~~6 or 7~~4, wherein the substantially transparent cover comprises a roller defining the pressing element, and wherein the laser beam passes in outward

direction through said transparent roller where it heats said paper object that is in contact with an outer surface of said substantially transparent cover.

~~9~~6. Device according to any of the foregoing claims ~~6-8~~, wherein the substantially transparent cover comprises an anti-reflective coating on the laser side of said cover.

~~10~~7. Device according to any of the foregoing claims ~~6-9~~, wherein the substantially transparent cover comprises an oleophobic coating on the paper side of said cover.

~~11~~8. Device according to any of the foregoing claims ~~6-10~~, wherein the paper object is sandwiched between said substantially transparent cover and a support, wherein said support ~~preferably~~ comprises a backing roller, and/or wherein said support even more preferably comprises reflective properties.

~~12~~9. Device according to any of the foregoing claims, comprising pre-heating means configured for pre-heating at least the parts of the paper object that are to be heated with said laser.

~~13~~10. Device according to any of the foregoing claims, comprising an activated carbon support, wherein more preferably said support is an activated carbon roller.

~~14~~11. Method for the selective carbonization of at least a part of a surface of a paper object, more particularly of a sheet of paper, comprising the steps of:

- receiving the object in receiving means; ~~and~~

- controlling heating means with control means in order to selectively heat one or more parts the surface of said paper object to a level wherein the heated part of said surface at least partly carbonizes and thereby changes color.;

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~~15. Method according to claim 14,~~ wherein the step of heating the surface comprises the step of radiative heating by a laser.;

- wherein the heated part of the paper object is heated in a low oxygen environment; and

- wherein the low oxygen environment is created by placing a substantially transparent cover on top of said paper object and wherein said laser heats said paper object through

said substantially transparent cover, wherein said transparent cover is pressed on at least the to be heated parts of said paper object.

~~16~~12. Method according to claim ~~15~~11, wherein said laser emits light with a wavelength that substantially matches the peak absorption spectrum of said object in the near infrared range.

~~17. Method according to any of claims 14-16, comprising the step of the control means adjusting the power of said laser and/or selectively switching the laser on and off in order to selectively expose the paper object to the laser.~~

~~18. Method according to any of claims 14-17, wherein control means control the movement of said laser beam in order to selectively expose the paper object to the laser beam.~~

~~19. Method according to any of claims 14-18, comprising the step of the receiving means moving the paper object relative to the laser.~~

~~20. Method according to any of claims 14-19, wherein the heated part of the paper object is heated in a low-oxygen environment.~~

~~21~~13. Method according to ~~claim 20~~11 or 12, wherein the low oxygen environment is created by one or more of the following steps:

- creating a partial vacuum by pumping air away from at least the to be heated part of said paper object;
- introducing an inert gas at or near at least the to be heated part of said paper object;
- introducing steam at or near at least the to be heated part of said the paper object; and/or
- isolating at least the to be heated part of said paper object from the surrounding atmosphere by using a thermally conductive barrier.

14. Method according to any of claims 11-13, wherein the low oxygen environment is created by ~~; and/or~~

~~——————~~isolating at least the to be heated part of said paper object from the surrounding atmosphere by using a substantially transparent cover.

~~——————22. Method according to claim 20 or 21, wherein the low oxygen environment is created by placing a substantially transparent cover on top of said paper object and wherein said laser heats said paper object through said substantially transparent cover, wherein said transparent cover is preferably pressed on at least the to be heated parts of said paper object.~~

~~23~~15. Method according to any of the claims ~~14~~11-~~22~~14, wherein the control means control the carbonization by ~~one or more of the following steps:~~

~~——————adjusting the power of the laser;~~

~~——————adjusting the exposure time of laser per unit area of the paper object;~~

~~——————~~adjusting the rate compression at the to be heated parts of said paper object~~;~~ ~~and/or~~

~~——————adjusting the focus of the laser beam~~.

~~——————24. Method according to any of claims 14-23, wherein a device according to any of claim 1-13 is used.~~