CLAIMS

1. A printing device for the selective carbonization of at least a part of a surface of a paper object, 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 colour; and
- a controller for controlling the laser;

characterized in that said printing 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. The device according to claim 1, wherein the paper object is a sheet of paper.

3. The device according to claim 1 or claim 2, wherein a 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. The device according to claim 3, wherein the mirror is moveable, and wherein the movement of said mirror is controllable by said control means.

5. The device according to any one of the foregoing claims, 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.

6. Device according to claim 5, 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.

7. The device according to any one of the foregoing claims, wherein the substantially transparent cover comprises an anti-reflective coating on the laser side of said cover.

8. The device according to any of the foregoing claims, wherein the substantially

transparent cover comprises an oleophobic coating on the paper side of said cover.

9. The device according to any one of the foregoing claims, wherein the paper object is sandwiched between said substantially transparent cover and a support, wherein said support comprises a backing roller, and/or wherein said support comprises reflective properties.

10. The device according to any one 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.

11. The device according to any one of the foregoing claims, comprising an activated carbon support.

12. The device according to claim 11, wherein said support is an activated carbon roller.

13. A method for the selective carbonization of at least a part of a surface of a paper object, comprising the steps of:

- receiving the object in receiving means positioned in a printing device;
- 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 colour;
- 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 of the printing device 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.

14. The method according to claim 13, wherein said laser emits light with a wavelength that substantially matches the peak absorption spectrum of said object in the near infrared range.

15. The method according to claim 13 or claim 14, 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 and/or
- isolating at least the to be heated part of said paper object from the surrounding atmosphere by using a substantially transparent cover.

16. The method according to any one of the claims 13-15, wherein the control means control the carbonization by adjusting the rate compression at the to be heated parts of said paper object.

17. The method according to any one of the claims 13-15, wherein the low oxygen environment is created control by isolating at least the to be heated part of said paper object from the surrounding atmosphere by using a substantially transparent cover.

18. The method according to any one of the claims 13-17, wherein the paper object is a sheet of paper.