PLASMA TREATMENT OF FLEXOGRAPHIC PRINTING SURFACE

Background

Flexographic printing has been widely used for many diverse printing applications. In flexographic printing a liquid is transferred from a printing surface of a flexographic printing plate, to a substrate to be printed. Substrates to be printed have been subjected to processes such as plasma treatment to enhance the printability of the substrate by e.g. increasing the surface energy of the substrate, as discussed by Wolf ("Game-Changing Surface-Pre-Treatment Technology"; *Converting Quarterly*, October 2011). Correspondingly, it has historically been thought that the printing surface of a flexographic printing plate should have a surface energy that is lower than that of the substrate to be printed, in order to promote transfer of the liquid from the printing surface of the flexographic printing plate onto the substrate (or it has been thought that, at most, the surface energy of the printing plate will have little or no influence on the liquid transfer and thus on the print quality), as discussed by Liu and Guthrie ("A Review of Flexographic Printing Plate Development"; *Surface Coatings International Part B: Coating Transactions*, June 2003, **86**, B2).

Summary

In broad summary, herein is disclosed a method of plasma treating a flexographic printing plate, and a method of using such a plasma-treated flexographic printing plate to transfer a liquid to a printable substrate.

In a first aspect, there is provided a method of flexographic printing, the method comprising: transferring a liquid from an anilox roll to a printing surface of a plasma-treated flexographic printing plate, and transferring the liquid from the printing surface of the plasma-treated flexographic printing plate to a surface of a substrate.

In a second aspect, there is provided a method of plasma treating a flexographic printing plate, the method comprising: exposing at least the printing surface of a flexographic printing plate to a plasma.

In a third aspect, there is provided an article, comprising: a flexographic printing plate comprising a plasma-treated printing surface. These and other aspects of the ~~invention~~ disclosure will be apparent from the detailed description below. In no event, however, should this broad summary be construed to limit the claimable subject matter, whether such subject matter is presented in claims in the application as initially filed or in claims that are amended or otherwise presented in prosecution.

Brief Description of the Drawings

Fig. 1 is a side schematic cross sectional view of an exemplary flexographic printing apparatus.

Fig. 2 is a side schematic cross sectional view of an exemplary flexographic printing plate.

Like reference numbers in the various figures indicate like elements. Some elements may be present in identical or equivalent multiples; in such cases only one or more representative elements may

be designated by a reference number but it will be understood that such reference numbers apply to all such identical elements. Unless otherwise indicated, all figures and drawings in this document are not to scale and are chosen for the purpose of illustrating different embodiments of the invention. In particular the dimensions of the various components are depicted in illustrative terms only, and no relationship between the dimensions of the various components should be inferred from the drawings, unless so indicated. Although terms such as "top", bottom", "upper", lower", "under", "over", "front", "back", "outward", "inward", "up" and "down", and "first" and "second" may be used in this disclosure, it should be understood that those terms are used in their relative sense only unless otherwise noted. As used herein