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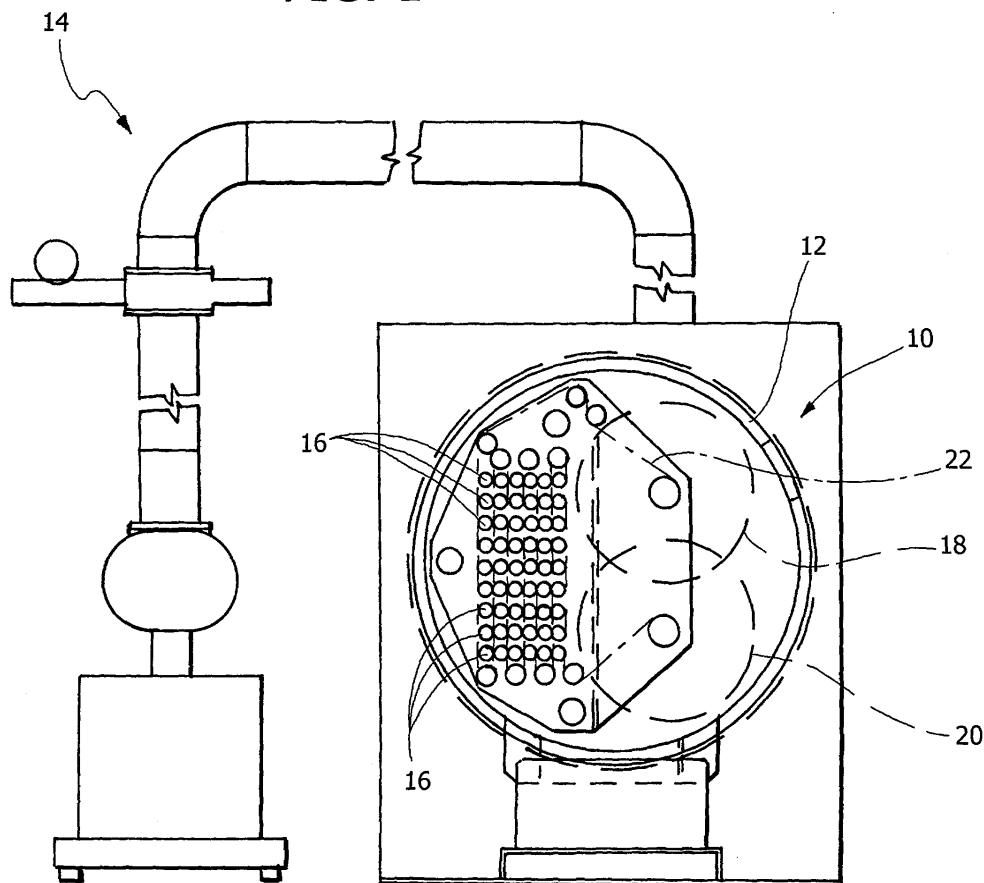
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(54) **A method for treating the printing layer of a printing blanket or a varnishing plate**

(57) A method for treating the surface of a printing layer (22) of a printing blanket or a varnishing plate, comprising the step of making said layer (22) pass in a cold gaseous plasma environment in a vacuum.

FIG. 1



Description

[0001] The present invention relates, in general, to the offset printing industry. In offset printing machines, ink is transferred onto a sheet to be printed by means of one or more printing blankets having an ink transfer surface that acts on the sheet to be printed. Sometimes, a layer of clear varnish is applied on the printed sheet by means of a varnishing plate.

[0002] Printing blankets and varnishing plates are provided with a printing layer having a surface for transferring the ink or the varnish. Said printing layer is normally made of natural or synthetic rubber. Use of rubber to form the printing layer of printing blankets and of varnishing plates is a nearly essential requirement because other materials have no wettability characteristics which would allow their use in lieu of rubber to obtain the active layer of printing blankets or of varnishing plates.

[0003] The wettability of the surface of a material is measured by the inner angle between the surface of the material and a straight line tangential to a drop of water deposited on the surface. The smaller the aforesaid angle, the better the wettability of a surface.

[0004] The object of the present invention is to provide a method for the superficial treatment of the printing layer of printing blankets and of varnishing plates, which allows to use other materials instead of rubber.

[0005] According to the present invention, said object is achieved by a method having the characteristics set out in the claims.

[0006] The present invention shall now be described in detail with reference to the accompanying drawings, provided purely by way of non limiting example, in which:

- Figure 1 is a schematic view of an apparatus to implement the method according to the invention,
- Figure 2 is a schematic view showing the measure of wettability of an untreated surface, and
- Figure 3 is a schematic view similar to Figure 2 showing the measure of wettability of a surface treated with the method according to the invention.

[0007] With reference to Figure 1, the number 10 designates an apparatus for the superficial treatment of a printing layer of a printing blanket or of a varnishing plate. The apparatus 10 comprises a watertight container 12 and an aspiration system 14 able to determine sub-atmospheric pressure conditions within the container 12. The system 14 is preferably able to create conditions of vacuum in the container 12, with pressures in the order of 50-400 mm Hg. In the container 12 is positioned a plurality of electrodes 16 able to create a strong electrical field which dissociates the bonds of the molecules of low pressure gases present in the container 12. In the container 12 is positioned a reel 18 of a strip of polymeric material to be treated and a reel 20 whereon the treated strip is wound. The strip to be treated 22 fol-

lows a path which extends between the various arrays of electrodes 16.

[0008] The container 12 contains a gas selected within the group comprising nitrogen, oxygen or air, in sub-atmospheric conditions (pressure in the order 50-400 mm of Hg). The electrical voltage applied between the electrodes 16 produces a cold plasma with temperature in the order of 30-80°C.

[0009] The ribbon 22 is made of polymeric material selected in the group comprising: polyurethane, polyvinylchloride (PVC), ethylene vinyl acetate (EVA), polyethylene glycol (PEG), polypropylene glycol (PPG), polytetramethylene glycol (PTMEG), polyester, polyvinyl alcohol (PVOH), polyethylene, polypropylene and amalgams or mixtures of one or more of said materials.

[0010] Making the strip 22 pass in the cold gaseous plasma in a vacuum, the superficial characteristics of the strip 22 are modified.

[0011] Figure 2 schematically shows in highly enlarged scale a water drop 24 on the surface 26 of a layer 22 not subjected to the plasma treatment. The wettability of the surface 26 is measured by the inner angle α between the surface 26 and straight line 28 tangential to the outer surface of the drop 24 in the point of contact with the surface 26. For untreated polyurethane, the angle α that measures the wettability of the surface 26 is in the order of 105-145°.

[0012] Figure 3 shows a water drop 24 on the surface 26 of a layer of polyurethane subjected to the plasma treatment described above. In this case, the angle α that measures the wettability of the surface 26 is in the order of 30-80°.

[0013] The surface 26 of the printing layer 22 can be smooth or embossed. The wettability of the surface improves (i.e. the angle α decreases) for embossed and plasma treated surfaces.

[0014] Tests conducted by the Applicant have demonstrated that the plasma treatment of a layer of polymeric material, for example polyurethane, makes said layer suitable for use as a printing layer of a printing blanket or of a varnishing plate. Polyurethane would not be suitable for such use without the plasma treatment.

[0015] Plasma treated polymeric material has wettability characteristics that are similar to those of the natural or synthetic rubbers traditionally used to obtain the active layer of printing blankets and of varnishing plates. Therefore, thanks to the aforesaid treatment, it becomes possible to use polymeric materials instead of rubber to form the printing layer of a printing blanket or of a varnishing plate.

Claims

1. A method for treating the surface of a printing layer of a printing blanket or a varnishing plate, comprising the step of making said layer (22) pass in a cold gaseous plasma environment in a vacuum.

2. Method as claimed in claim 1, wherein the plasma environment is at a pressure ranging between 50 and 400 mm of Hg.
3. Method as claimed in claim 1, wherein the plasma has a temperature ranging between 30° and 80°C. 5
4. Method as claimed in claim 1, wherein the layer (22) has at least one embossed surface. 10
5. Method as claimed in claim 1, wherein the angle of wettability of a surface (26) of the layer (22) after exposure to the gaseous plasma ranges between 30° and 80°C. 15
6. Method as claimed in claim 1, wherein the layer (22) is made of polymeric material selected among the group comprising: polyurethane, polyvinylchloride (PVC), ethylene vinyl acetate (EVA), polyethylene glycol (PEG), polypropylene glycol (PPG), polytetramethylene glycol (PTMEG), polyester, polyvinyl alcohol (PVOH), polyethylene, polypropylene and amalgams or mixtures of one or more of said materials. 20 25

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FIG. 1

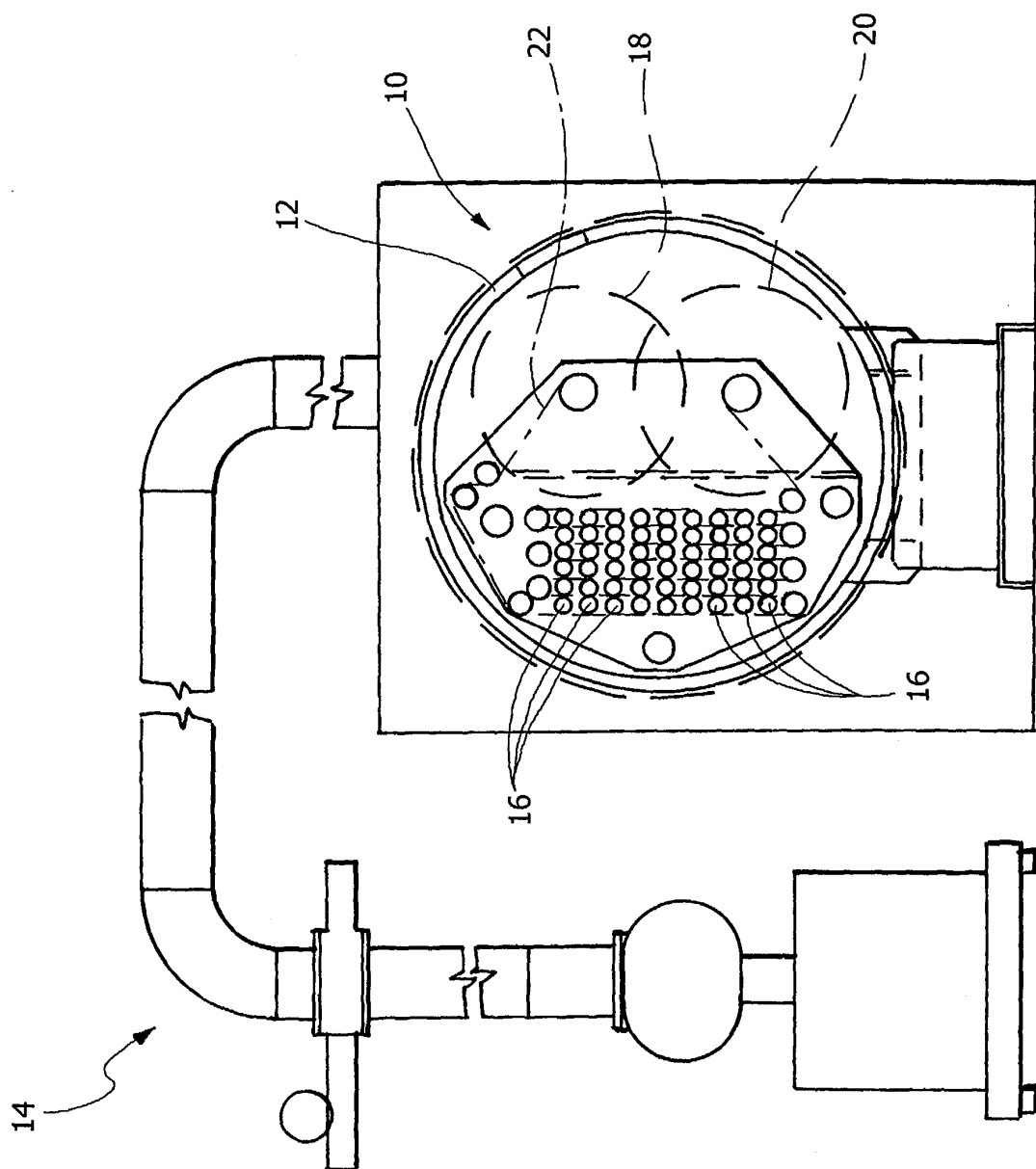


FIG. 2

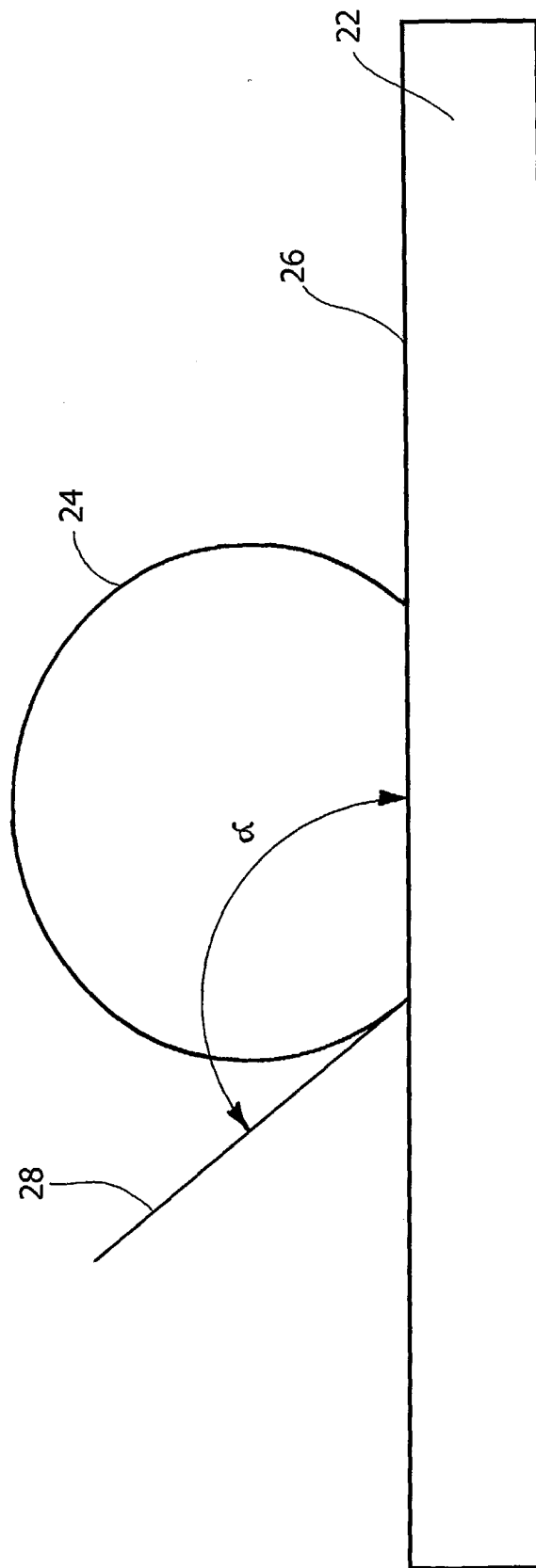
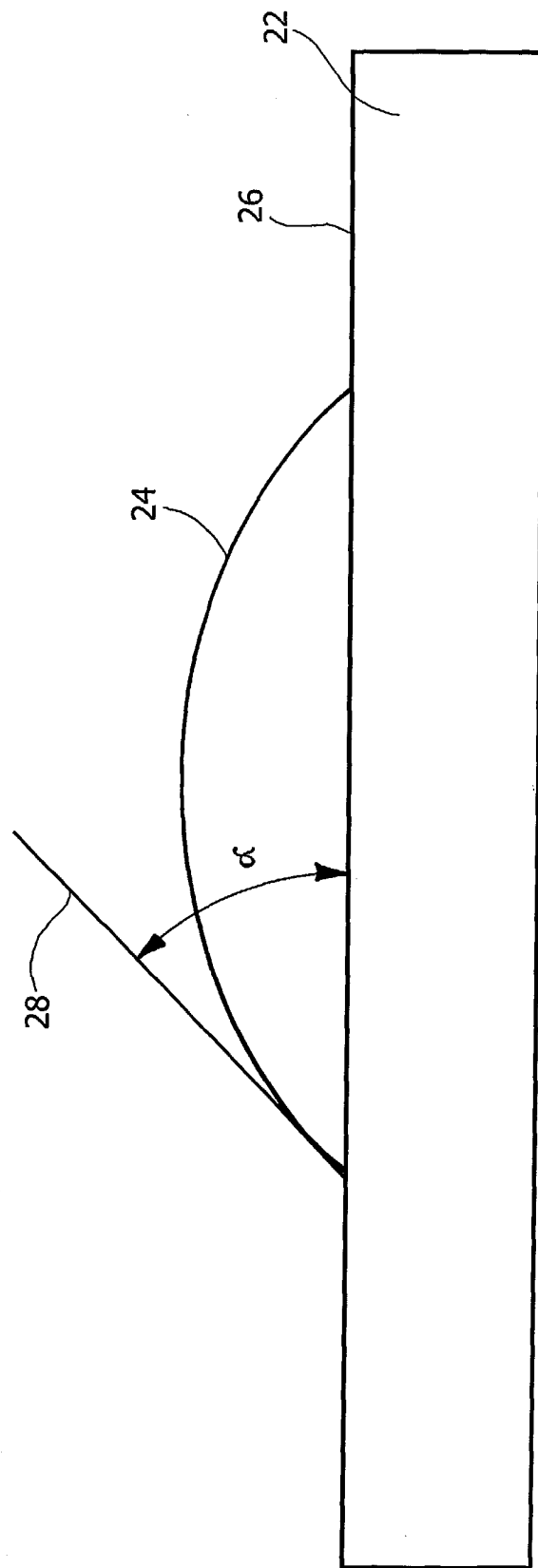


FIG. 3





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EUROPEAN SEARCH REPORT

Application Number
EP 04 42 5288

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 7 October 2004	Examiner Vogel, T
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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