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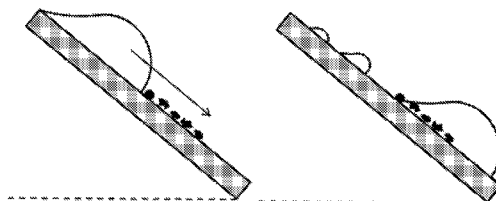


Figure 1

(57) **Abstract:** An embodiment of the present disclosure relates to a method of forming a self-cleaning coating on a substrate. Such a method comprises the step of selecting a substrate. In an embodiment, the substrate may be a flat or a non-flat substrate. In a related embodiment, the substrate may comprise of metals, metal oxides, organic/inorganic composites containing metals/metal oxides and plastic with silicon dioxide or metal oxides layer by sol-gel formation or other methods. In an embodiment, such a method comprises the step of cleaning the substrate. In another embodiment, the method comprises the step of roughening the substrate using an abrasive. In an embodiment, roughening of the substrate create microscopic tortuous grooves. Another embodiment of the method comprises coating the roughened surface with at least one hydrophobic chemical agent. In an exemplary embodiment, the hydrophobic chemical agent covalently binds with the substrate creating nanoscopic grooves. In an embodiment, the hydrophobic chemical agent is a Fluoroalkylsilane. In another embodiment, the coated substrate has a light transmission or reflection similar to or higher than that of the uncoated substrate. Another embodiment of the present disclosure pertains to an apparatus for depositing a self-cleaning coating on a flat substrate. A further embodiment of the present disclosure pertains to a self-cleaning coating on a substrate comprising a hydrophobic chemical agent covalently bonded to at least one roughened surface of the substrate.