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NEW TRENDS IN PRINTING TECHNOLOGY

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ABSTRACT

The printing is a most widely used technology. Every human being every day touch with the any printed product. This product printed with the help of many printing processes. The invention of printing is the great invention of the human history. The printing transfers the information one person to another person. In other words, the printing transfers the information generation to generation. Today we read some histories of different countries it's a gift of printing. In this research paper we discuss about the new trends of printing technology.

Keyword: *Toshiba erasable ink printer, nanotechnology for printing, conductive ink, printed electronic, IoT's, QR, AR.*

I. INTRODUCTION

Toshiba Erasable Ink Printer: Now a days Toshiba invent an ink removable printer which name is e-STUDIO3508LP. This printer is the world's first monochrome multi-work frameworks with erasable print work.A special hybrid printing technology, one single gadget prints ordinary just as reusable prints, which spares paper. This printer speed is 50 pages per min. This printer removes the traditional black or erasable blue toner. This eraser paper is reused four times.

Nanotechnology for Printing: Another digital printing process based on nanotechnology was presented via **Landa Corporation** in 2012. The process utilizes little pigment water-based particles, which is around many nanometers in size. Nanotechnology gives new dimension of printing field. It is widely used in printing industry as well other industry. The Nano word derived from Greek word "Nanos" which means very small man or woman. We know a scale of length measurement: meter(m), millimeter(mm) = 10^{-3}m, micrometer = 10^{-6}m, nanometer(nm)=10^{-9}m. Nanotechnology and printing introduce a new field like Printed Electronic, Conductive Ink and security printing etc.

Conductive Ink: The conductive ink is a very important in the printed electronic and flexible electronic. The conductive ink use as a conductor in a printed circuit. There are three fundamental segments: a polymer binder, a conductive material, and a solvent. In the wake of printing, the solvent vanishes, leaving a conductive example on a substrate. The materials presenting conductivity to the inks incorporate particles of silver, copper, carbon, and conductive polymers. The applications for conductive inks and glues are many: touchscreens, photovoltaics, car, medicinal, RFIDs, sensors, and batteries.

Printed Electronics: Printed electronics (PE) method permits electronic and photonic gadgets to be created utilizing printing-based strategies, for example, screen printing or inkjet, with leading or semiconducting inks. PE can print resistors, condensers, transistors, interconnects, and most other electronic segments in customary circuits, on a wide scope of substrates, similar to fabric or plastic. Inkjet printing with the utilization of inks dependent on metal nanoparticles (NPs), metallo-natural deterioration ink (MOD) in light of metallo-natural buildings (MC) or salts of different metals is an appealing minimal effort innovation for direct metallization.

Printed Paper Photovoltaic Technology: The printed paper photovoltaic technology is a latest technology used for print the solar cells. The photovoltaic cells manufactured by different process and different printing processes. Screen printing is most commonly used for print the photovoltaic cells and some industries used web offset printing

process. Nowadays inkjet printing is maximum used for print the solar cells. The printing processes reduce the manufacturing cost of the solar cells.

OLED: OLED (Organic Light Emitting Diodes) is a level light radiating innovation, made by setting a progression of natural thin movies (for the most part carbon based) between two conductors. At the point when an electrical flow is connected, light is produced. OLEDs can be utilized to make shows and lighting, with conceivable applications that range TV sets, PC screens, cell phones, beautifying lighting and the sky is the limit from there. Since OLEDs produce light they don't require a backdrop illumination thus they are slenderer than LCD shows, and are additionally progressively proficient, more straightforward to improve and flaunt a shading contrast.

Inkjet OLED printing has the attractive capacity to permit exactness stores without the utilization of a cover. It likewise delivers less stray particles, along these lines boosting yields. These huge favorable circumstances make this innovation fascinating to numerous organizations and for all intents and purposes all OLED producers have dynamic ink-fly printing advancement ventures.

Internet of Things(IoT): Now a day the IoT is maximum used technology in every field home as well as offices. The Internet of Things (IoT) is the most hopeful territory which enters the benefits of Wireless Sensor and Actuator Networks (WSAN) and Pervasive Computing spaces. Distinctive utilizations of IoT have been created and scientists of IoT all around distinguished the chances, issues, challenges and the innovation models utilized in IoT, for example, Radio-Frequency Identification (RFID) labels, sensors, actuators, cell phones. The Internet of Things enables individuals and things to be associated Anytime, Anyplace, with anything and anyone, in a perfect world utilizing any way/organize and any administration. This infers tending to components, for example, Convergence, Content, Collections, Computing, Communication, and Connectivity. The Internet of Things gives communication among the genuine/physical and the advanced/virtual universes.

These clears new component of IoT idea in the areas, for example, store network the executives, transportation and co-ordinations, aviation, and car, brilliant situations (homes, structures, framework), vitality, safeguard, farming, retail and then some.

QR Code: QR Codes was invented by the Toyota backup Denso Wave in 1994, and the QR code first time user for the vehicle parts fabricating. The thought behind the advancement of the QR code is the confinement of the barcode information limit (can just hold 20 alphanumeric characters). While they are created for following parts in vehicle fabricating.

A QR code is a type of matrix bar code or two-dimensional code that can store information and intended to be perused by cell phones. QR means "Quick Response" demonstrating that the code substance ought to be decoded very quickly at rapid. The code comprises of dark modules organized in a square example on a white foundation. The information encoded might be content, a URL or other information. The QR code was intended to enable its substance to be decoded at fast. The prevalence of QR codes is becoming quickly all around the globe. These days, cell phones with inherent camera are broadly used to perceive the QR Codes.

QR codes presently are utilized in numerous different fields, from business following to excitement, in-store item marking, and in those applications that are gone for cell phone clients. Clients may open URL; get message in the wake of filtering QR codes. By utilizing QR code creating destinations or applications, clients can produce and print their very own QR codes for others to output and utilize.

AR Code: The Augmented Reality (AR) is a new technology in the printing as well as other industry. Augmented reality is an innovation that deals with PC vision based recognition algorithms to increase sound, video, illustrations and other sensor put together contributions with respect to certifiable items utilizing the camera of your gadget. It is a decent method to render genuine data and present it in an intuitive way so virtual components turn out to be a piece of this present reality. Augmented reality shows superimpose data in your field of view and can bring you into another existence where the genuine and virtual universes are firmly coupled.

A straightforward augmented reality use case is: a client catches the picture of a genuine article, and the hidden stage recognizes a marker, which triggers it to include a virtual item best of this present reality picture and shows on your camera screen. For example: Printing and advertising industries are developing apps to display digital content on top of real world magazines, newspaper, ID cards and books etc.

Latex Ink: The latex ink is a quick dry ink used in the inkjet printers. The latex ink is apace growing in popularity because of its flexibility and versatility. The latex ink is water based ink. Latex ink have not required extra the drying mechanism for drying. This ink is environment friendly ink. This ink printed product no need to lamination. The latex ink provides wide range of printed materials including PVC, paper, fabric, and PET film without the ink absorbing layer, which is typically difficult to print on with solvent ink.

"Latex" is a general expressive term for a fluid (water) scattered polymer. The polymer exists as round particles and are scattered in water. The polymer is a synthetic (fabricated) material."Latex" was an extraordinary smoke-and-mirrors ploy. The polymer fixes (blends) into a film under extraordinary warmth. Polymers are atomic mixes, either normal or artificially produced, that are comprised of many rehashing units of monomers.

Ultra-VioletInks (UV):UV inks and varnishes were firstly invented by the Graphic Industry in the 1970s. Nowadays the UV inks is widely used in the all printing processes like offset, letterpress, flexography, waterless, varnishing, serigraphy, etc. This is special ink which dry with UV light exposer. The actual "drying" mechanism of UV inks is one of polymerization and not the evaporation of water or a solvent. It's drying mechanism based on the chemical reaction. UV printing is an environment friendly, considered as a green technology and leaving an almost zero carbon footprint.

LED Printer: The LED printer is new technology of computer printer. In this printer replace the laser with LED. In this printer we use the LED as a light source as a laser light source in laser printer. LEDs are more efficient and reliable than conventional laser printers. They have fewer moving parts as comparison to the laser printer and so they have less mechanical loss. The LED printer fast speed as comparison to the laser printer. Laser printers have moving parts like combinations of rotating mirrors and lenses but the LED printer have no moving parts. OKI Data has developed specialty LED Printers that use a CMYW toner system rather than CMYK. In the LED printers the Black Toner "K" replace with White Toner "W".

Intelligent Packaging: An intelligent packaging is an emerging technology that uses the communication function for promotion, for safety, for instruction. The basic function of an intelligent packaging classified into categories: - 1. Protection 2. Communication, 3. Convenience, 4. Containment (Paine 1991, Robertson 1993). Every customer become more health conscious and demand better than the food industry needs to improve the quality and safety of its products and improve quality than introduce with a new package. These packages shall be protecting of the product and provide the convenience as well as information.

Time Temperature Indicator: Time-Temperature Indicator is very important technology in printing industry as well as packaging industry. Time indicator changed with respect to time as well as the temperature indicator changed with respect to temperature. Time indicator shows expire date of the product for example: - A product label printed with grey ink properties (which is changed with respect to time) and substrate. When this product wash will be expired then this label colour is changed.

Temperature indicator is defined as which changed with temperature. When change the colour of package of product according to increased or decreased the temperature of place. This type of package is printed by the thermos-chromic ink. In the United State, these indicators are used in chilled ready-made meat and dairy food such as ice cream. These indicators changed on the product label and not the actual temperature of product. Sometime temperature indicators like Oxygen TTI, Carbon Dioxide TTI, Colour TTI, Pathogen indicator, Freshness TTI, Leak indicators.

Radio Frequency Identification Tag: RFID is a wireless identification system that is capable of transferring stored data in the tag section to a reader using electronic and electromagnetic signals. The common RFID frequencies range from low (125 KHz) to UHF (850-900 MHZ).Mainly three types of RIFD **1.)** Passive, 2.) Semi-active, 3.) Active.

The Passive RFID tags are very important in intelligent packaging. The Passive tags have no internal power source. The passive tags receive their energy from antenna and through the signal received from the reader.In Semi-active tags, a small battery is used for providing energy. In Active tags, an internal power source is used for providing energy. The Active tags is used for transmit long distance information.

II.   CONCLUSION

Printing has been innovative right from its beginning. New innovations are taking place in this field time to time. The above discussed new trends like erasable ink, nanotechnology, conductive inks, printed electronics, OLED, QR/AR codes will surely make transformations which will lead printing world to lead new heights.

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