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Design and Manufacturing of Medicine Reminder Bottle

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Abstract: ***Our project main aim is to make a Smart medicine bottle for those users who regularly take medicines and the prescription of their medicine is very long as it is hard to remember for patients and also for their caregivers. Also, Old age patients suffer from problems of forgetting to take pills at the proper time which causes certain health issues for patients having Permanent diseases like diabetes, thyroid, blood pressure, breathing problem, heart problems, and cancer diseases. We saw these problems in hospitals & people around us who have such kinds of diseases and thus based on these two problems we made smart medicine bottles that solve these problems by setting time schedule of prescribed medicines through push buttons as given in the prescription. (1).***

Index Terms: Smart medicine box, remember to patients, Also Old age patients, problems of forgetting, Setting up time,

I. INTRODUCTION

In day-to-day life, most people need to take medicines that were not there in the past couple of years and the reason behind this is diseases are increasing in a large amount. So sooner or later many people come in contact with these diseases. Some diseases are temporary while many are permanent life-threatening diseases.

Life-threatening diseases get mixed with the human body in such a way that they can't leave the body ever and they increase in rapid time. The life span of humans became less Because of such diseases and to overcome or to live a better life we need to take medicines regularly and also in large amounts. (1)(2).

The advice of a Doctor who tells us to take desired pills in the desired way so that patients face problems like forgetting Pills to take at right time and also when the Doctor changes the prescription of medicine patients have to remember the new schedule of medicine. This problem of forgetting to take pills at right time, taking the wrong medicines, and accidentally taking expired medicine causes health issues for the patient and this leads to suffering from unhealthy life.(1)

We can obtain our results of smart medicine bottle by using the 3D printing process

A. About 3D modelling & Drafting of plastic product

By using 3D CAD like Unigraphics NX 6.0 software we

Can design all types of concept parameters required for mold design and product design. We can develop a type of 3D model and required view in understanding orientation. We can understand all types of interference and motion of simulation [5]

B. 3D Printing

3D Printing plays an important role in the development of prototypes in a short time. With the help of a prototype model, we can check the aesthetics, ergonomics, and assembly of the product as well. We can create plastic as well as metal prototypes. Also, we can look at several possibilities for designing a mold.

For more simple way more quantity we can manufacture more by using the below scenario also

C. Mold Design using Mould Wizard for an optimum solution.

Using the Mold Wizard module of Unigraphics NX 6(Siemens product) the process of Mold Design can be done with ease as well as in the least time. This mold wizard generally helps a user to create a first object mold drawing for the next stage software mold base. You can select the shrinkage allowance for mold.

Which type of ejector pin is required, sprue bush, locating ring, sliders, runners, gating, and cooling line? By using mold wizard multiple molds are created automatically as per your requirement. [5]

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II. LITERATURE REVIEW

Today's corrival world demands that to save self in a demanding environment and market the entrepreneur and customer need to ensure that their product gets designed and manufactured at a cheap cost and less possible time. And most important thing is to without losing their quality acceptance. So is a must for a designer, workers in the production department, and engineers to work together in a correlated fashion. Today CAD/CAM/CAE and 3D printing systems are more accurate, cheap, less time required to get a result for your manufacturing product. CAD Software gives us a variety of Creation tools that allow us to proceed in a step-by-step way, to create a 3D representation of the product. CAD/3D printing software generally gives us a creation of a model by using 2D lines, arcs, curves, circles, solid models, and wireframes using this we can move through the solid face as per requirement and find the final product. For this reference molds cavity and core for these products can also be created using previous geometry created. [6] The definition of 3-D printing is somewhat inexact. While some experts in the field would restrict 3-D printing to units with inkjet-based print heads that create an object on a layer-by-layer basis, others would apply this term to office or consumer versions of rapid prototyping machines that are relatively low-cost and easy to use (Casey, 2009). The word 'rapid' relates to the ease of making a copy of an object due to the simplicity of writing a computer program that controls the object's shape. The term 'prototyping' refers to this process as being too slow for use in mass production (in contrast to injection molding technologies that yield large quantities at low per-unit costs). Healthcare and medical industry 3D printing technology can use to print 3D skin [17], drug and pharmaceutical research [17], bone and cartilage [17], replacement tissues [17], organs [17], printing for cancer research and lastly models for visualization, education, and communication.

There are several advantages of 3D Printing technology for biomedical products which are:

1) 3D printing technology can replicate the natural structure of the skin at a lower cost. 3D-printed skin can be used to test pharmaceuticals, cosmetics, and chemical products. Therefore, it is unnecessary to use animal skin to test the products. Consequently, it will help the researcher to get accurate results by using replicating the skin [17]

2) By using 3D printing technology to print drugs can increase efficiency, accurate control of dropped size and dose, high reproducibility, and ability to produce dosage forms with complex drug-release profiles [17].

3) 3D printing technology can print cartilage and bone to replace bony voids in the cartilage or bone caused by trauma or disease [66]. This treatment is a different option from using auto-grafts and allografts because this treatment focuses on generating bone, maintaining, or improving its function by using it in vivo.

4) 3D printing technology also can be used to replace, restore, maintain, or improve the tissue's function. The replacement tissues produced by 3D printing technology have an interconnected pore network, biocompatible, have appropriate surface chemistry, and have good mechanical properties [17].

5) 3D printing technology also can be used to print out similar organ failures caused by critical problems such as disease, accidents, and birth defects.

6) 3D printing technologies can form highly controllable cancer tissues model and shows great potential to accelerate cancer research. By using 3D printing technology, patients can get more reliable and accurate data.

7) 3D printout models can use in the learning process to help neurosurgeons practice surgical techniques. Using a 3D model can improve accuracy, can take a short time for the trainer when performing a clinical procedure, and provides opportunities for training surgeons hands-on, as the 3D model is a simulation of a real patient's pathological condition[17].

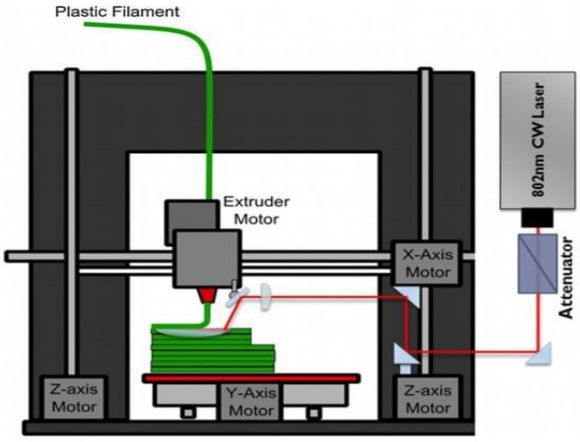


Fig 1. 3d printer operation

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The purpose of this article is to provide an overview of the 3-D printing process; its current and potential uses; its advantages as compared with other technologies such as mass customization, injection molding, and cutting-based machinery; and its limitations.

III. METHODOLOGY

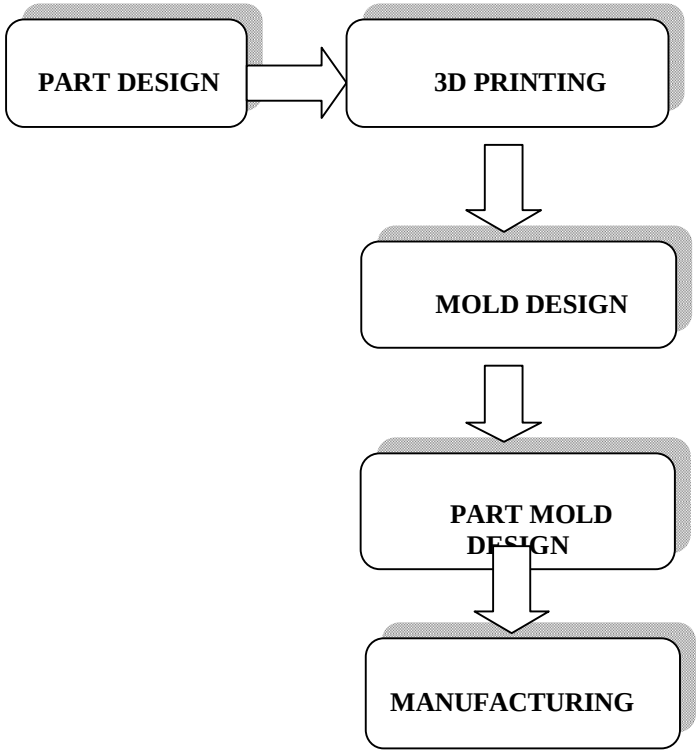


Fig 3. Methodology

IV. MATERIAL USED FOR MOLDING

The Acrylonitrile-Butadiene-Styrene polymers are mainly consisting of three monomer units: Acrylonitrile, Butadiene and Styrene. Plastic has got many versatile properties which include thermal resistance, light weight, easy formability, reflectivity etc. Regarding all these properties it has opened new way of use for material like ABS/ PC. This emphasizes the importance of studying the recycling of ABS as an aid to reducing economic, environmental and energy issues. Metallization is a process in which a non-conductive material such as plastic is made conductive by providing conductive layer on it. Additives play considerable role in determining final properties of every polymer material. To overcome this, a new approach was recently proposed based on the use of ionic liquids (ILs) as adjutants in ABS, enlarging the polarity range of these systems.[18] Due to combination of properties of the individual components, polymer blends provide an optimal price-service-ratio because of their higher performances characteristics at reasonable prices. Introducing pores to the material system, helps in further weight reduction and energy absorption through large compressive deformation, and this is (Fabricating porous Structures) easier and cost effective compared to metals and ceramics. An environment-friendly surface etching and activation technique for ABS material is a replacement for conventional chromic acid bath. By using this peel strength increases and adhesion strength reaches its maximum value. If thermoplastic polymers (ABS/PC) were treated with atmospheric plasma, the slower the plasma treatment tends to the greater wettability of the treated polymers, somehow which gives idea about surface modification.[18] During the recycling of ABS from waste electrical and electronic equipment (WEEE) voids defects can occur (caused by the evolution of volatile substances) and it was found that flexural strength and ductility in particular decreased with increased level of voids. Nickel electroplating of ABS plastic has been achieved without any palladium pre-treatment which is environmentally friendly. ABS material has wide range of application, and use of polymeric composites has grown at a rapid rate since 1960s. Hence in this review paper we are theoretically summing up all the physical and chemical properties of ABS/PC and its effect on environment. [18]

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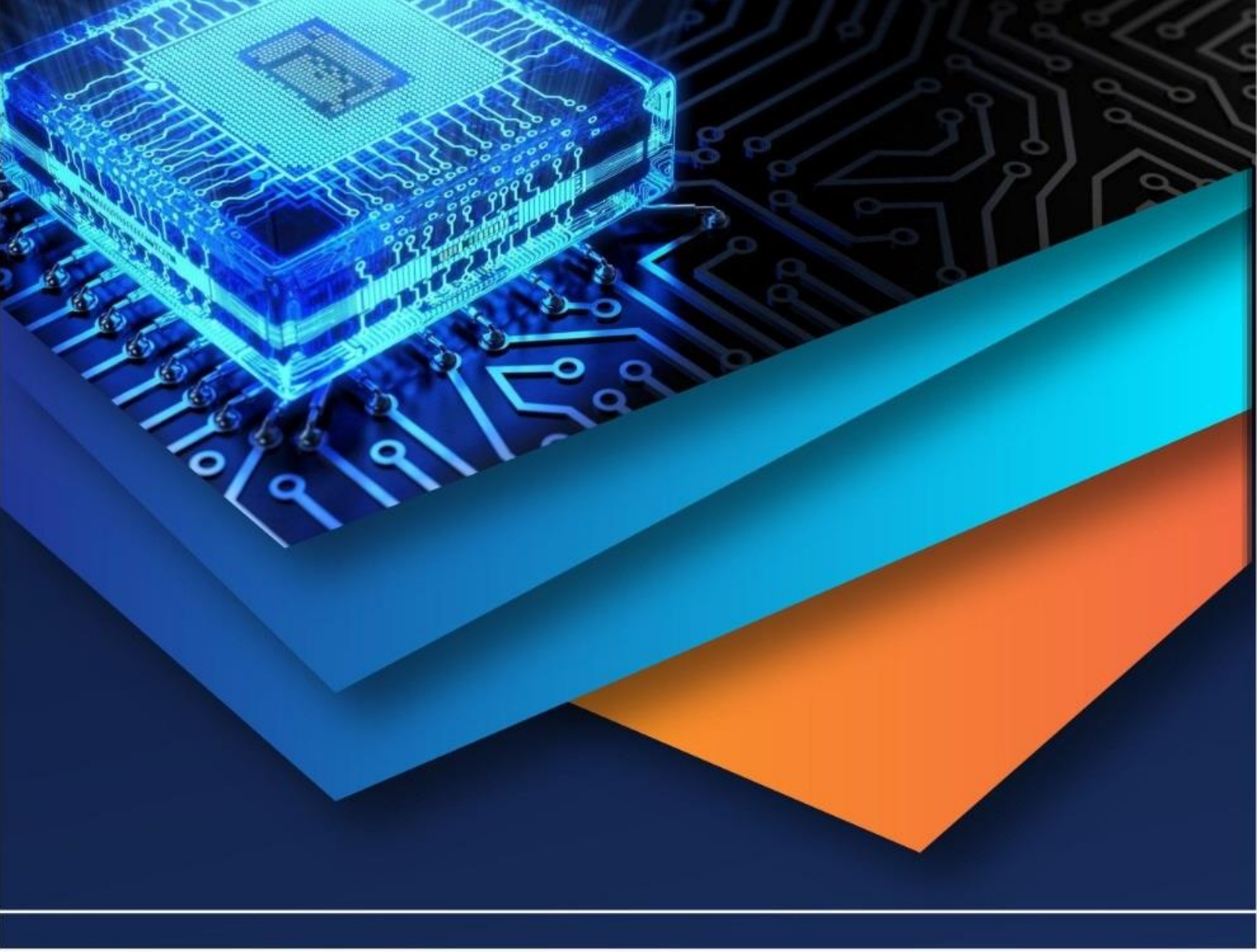
Fig.4. Material Used

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