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அகில பாரதீய வித்யார்த்தி பரிஷத்

திருச்சிராப்பள்ளி

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துரோணாச்சார்யா விருது

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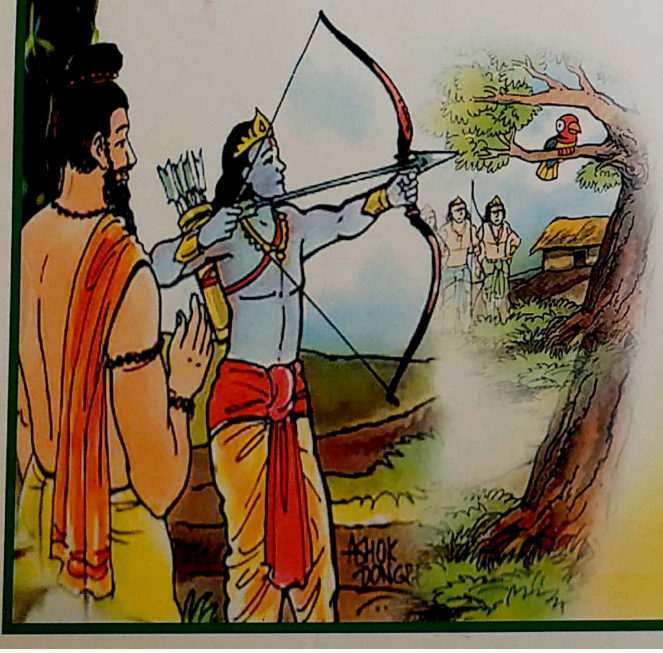

பெயர் : DR. பாரதிராஜா

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President

Secretary and Director General

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(54) Title of the invention : BIO-FABRICATION OF ARTIFICIAL METACARPAL HUMAN THUMB BONE FOR IMPLANTATION

(51) International classification	:A61K 31/00	(71)**Name of Applicant :** **1)Dr.S.BHARATHI RAJA** Address of Applicant :1/3, KUNDALAKESI STREET, MUTHAMIL NAGAR, THANJAVUR-613 007, TAMIL NADU, INDIA. Tamil Nadu India
(31) Priority Document No	:NA	
(32) Priority Date	:NA	
(33) Name of priority country	:NA	
(86) International Application No	:NA	(72)**Name of Inventor :** **1)Dr.S.BHARATHI RAJA**
Filing Date	:NA	
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(57) Abstract :
Road accidents in India have become a regular event every day. It was reported by National Crime Records Bureau (NCRB) that 16 accident victims are dead in every one hour on an average in 2014. Maximum accidents and maximum deaths are reported from Tamil Nadu, India. On the other side, in non-fatal accidents, bone fracture or complete bone damage may happen in road accidents. Among the various types of fractures such as stable, open compound, transverse, oblique and comminuted fractures, comminuted fracture is the one where bone shatters in to three or more pieces. While for the other types of fractures, remedy is available, there is a need to explore a method to give rehabilitation for the victims of comminuted fracture. Hence, an attempt has been made in this research work to explore the possibilities of creating artificial metacarpal human thumb bone for the affected victims. Hence, a study on bio-compatible material has been made to best suit our human body such a way an affected person could lead a normal life. In this research work, combined Poly-Lactic Acid (PLA) and Acrylonitrile Butadiene Styrene (ABS) bio-materials are mixed in the ratio of 80% and 20% respectively to get the required properties to bio-fabricate artificial metacarpal human thumb bone. Fused Deposition Modeling (FDM), which is one of the additive manufacturing techniques, is used for bio-fabrication. Moreover, the plan of implantation has to be carried out as early as possible from the time of accident for the considered victim for the desired effects. So, in this research work, design, analysis and bio- fabrication of artificial metacarpal human thumb bone for implantation has been accomplished. The fallowings are expected to be the positive outcomes of the proposed research work: 1. POLY-LACTIC ACID [PLA) and ACRYLONITRILE BUTADIENE STYRENE (ABS) are the two bio-materials used in the ratio of 80% and 20% respectively, which are bio-compatible 2. Non-recoverable Comminuted bone fracture affected patients may be revamped by the proposed methodology. - 3. The proposed methodology shall take approximately 10 to 12 hours to bio-fabricate the artificial metacarpal human thumb bone, provided all the facilities are available within the premises, which will be an elixir to the affected persons. 4. Doctor himself can carry out the bio-fabrication process from design to end product, provided all the facilities are available within the premises. 5. Cell decaying due to delay in the present traditional method of treatment can be completely eliminated, if it is done within the prescribed hours. 6. Removal of organ due to delay in the present traditional method of treatment can be completely eliminated, if it is done within the prescribed hours. 7. Pain and stress of the affected patients may be for a day or two when compared to very long present method of traditional treatment

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(54) Title of the invention : DEVELOPMENT OF MICRO LEAF JIG FOR MICRO COMPONENTS

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(57) Abstract :
The successful execution of any mass production depends upon the interchangeability of manufactured component to facilitate easy assembly and reduction of unit cost. Mass production methods demand a fast and easy method of positioning work for accurate operation of all machining processes. The production processes has witnessed numerous changes and evaluation with the introduction of numerous innovative manufacturing concepts which include using jigs and fixtures. The New manufacturing trend led to the demand for a better and cost effective work holding devices which ensure better quality products, reduce lead time and also increase throughput. Hence there is always a need to design the required jig and fixtures for the specified application. In this present research work, a micro leaf is designed to guide the micro drill bit to perform its drilling operation without tool failure. Micro leaf jig is a special work holding cum tool holding device which is used to clamp and support the micro part and guide the micro drills ranges from 0.2 mm to 0.8mm in micro drilling operation. Micro leaf jig is made of mild steel and coated with chromium plating to prevent corrosion. Micro leaf jig reduces job setting time, human error and machining cost. The damage of micro drill bit which eliminated by jig bush provided in the jig plate. Micro leaf jig securely clamp and rigidly support the micro parts during micro drilling process. Cleanliness, standardization, position of clamps and exact support are the key features of small holding devices. Micro leaf jig are suitable device to produce micro holes on metal plates without compromising machining tolerance. Micro leaf jig is designed by SOLID WORKS modeling and analyzed in ANSYS software. Micro leaf jig provided springs which is used whenever possible elevate the clamps clear of the component whilst being loaded and unloaded. The micro leaf jig is fabricated in the concept of small jig for small components. It is suitable for micro manufacturing system for producing small holes in watch, fuel injector nozzle, bio medical parts and microelectronic components.

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