

# NANOMAN: A MULTIPURPOSE DEVICE BASED ON NANOTECHNOLOGY

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**Abstract:** Day by day height and weight of human is reducing. [Due to advanced technology]. If we consider the some ratio by which it is decreased then in next 2000 to 3000 years the man's height will be in nanometers. Such a man may be known as 'Nanoman' This paper explores the same idea of 'Nanoman' The concept is parts of human body are replaced by the Nano machines and nanomaterial. - Nano engines, Nano servo motors, Nano computers etc. are used. It combines the biological science and mechanical engineering concepts. Nanoman can be used in applications like Medical, Engineering, Military, Dentist, Education, computer engineering and can be a useful device for defense.

**Keywords-** Nano, man, need, technique, height, material etc.

## I. INTRODUCTION

A nanoman is a device of 100nm size. A man is Nano scaled and some parts are replaced by Nano-mechanical devices. The parts in the body like heart, lungs, stomach, large intestine and small intestine are replaced by mechanical or electrical or electronic systems. Thermoelectric generators are used to generate electricity and same is circulated like blood in the complete body of 'nanoman'. Computer replaces brain and memory devices like memory chips, cards are used to store programs and information. It is artificial developed device [and it is possible that it will be executed after 2000yrs or 3000yrs by nature] Nano-IC engine combustion chamber or Nano- nuclear reactor or any other combustion chambers are used to develop the heat flux. 'Nanoman' is useful in medical, engineering, agricultural, military, aerospace engineering field. With some modifications can be used in many areas of science.

## II. NEED

The Nano scale Devices and Systems program area addresses the science and engineering of materials and device structures with characteristic sizes of ~100nm and below, at which phenomena such as quantum confinement and single-electron effects in electronics, near-field behavior in optics and electromagnetics, single-domain effects in magnetism, and a host of other effects in mechanical, fluidic, and biological systems emerge and become dominant. Both fundamental materials, processing, and device technologies, as well as the integration of such technologies into complex systems with consideration of system drivers and constraints as guides for the development of new materials and devices. 'Materials science' and 'materials technology', we normally

mean ceramics or crystalline materials, glasses or non-crystalline materials, polymers or heavy chain molecular materials and metals or cohesively-bonded materials. All these materials have a wide variety of applications in the diverse fields towards the service for the betterment of human life. The world of materials is rapidly progressing with new and trendiest technologies, and obviously novel applications. Nano technology is among these modern and sophisticated technologies → which is creating waves in the modern times. Actually, Nano technology includes the concept of physics and Chemistry of materials. It beckons a new field coming to the limelight. So, Nano technology is an interesting but emerging field of study, which is under constant evolution offering a very wide scope of research activity.

### What is Nano Technology?

Nano-technology is an advanced technology, which deals with the synthesis of Nano-particles, processing of the Nano materials and their applications. Normally, if the particle sizes are in the 1-100 nm ranges, they are generally called Nano-particles or materials. In order to give an idea on this size range, [1 nm = 10<sup>-9</sup> meter and 1 μm (i.e., 1 micron) = 10<sup>-6</sup> m = 1000 nm.] For oxide materials, the diameter of one oxygen ion is about 1.4 Å. So, seven oxygen ions will make about 10 Å or 1 nm, i.e., the 'lower' side of the Nano range. On the higher side, about 700 oxygen ions in a spatial dimension will make the so-called 'limit' of the Nano range of materials.

### Why Nano Technology?

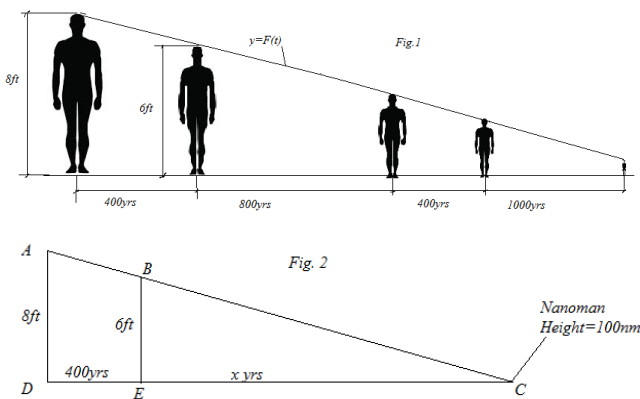
In the materials world, particularly in ceramics, the trend is always to prepare finer powder for the ultimate processing and better sintering to achieve dense materials with dense fine-grained microstructure of the particulates with better and useful properties for various applications. The fineness can reach up to a molecular level (1 nm – 100 nm), by special processing techniques. More is the fineness, more is the surface area, which increases the 'reactivity' of the material.

So, the densification or consolidation occurs very well at lower temperature than that of conventional ceramic systems, which is finally 'cost-effective' and also improves the properties of materials like abrasion resistance, corrosion resistance, mechanical properties, electrical properties, optical properties, magnetic properties, and a host of other properties for various useful applications in diverse fields. Iijima in 1991 discovered CNT, carbon nanotubes (CNTs)

with high aspect ratio, large surface area, low density as well as excellent mechanical, electrical and thermal properties have attracted scientific and technological interests globally. CNTs are useful for storing H<sub>2</sub> [hydrogen] A various Nano materials are available to store solar energy. Synthesis, processing and fabrication of nanomaterial is possible by various ways.

III. IDEA GENERATED [REALISING]

Refer to Historical old scriptures, the man life was 900yrs and height may be around 10ft or even more. If we take review of last 400yrs, man height was average 8ft., today it is around 5.5ft. In the next coming years it may go on reducing and after 1000 to 2000yrs it may reach to nanometer. Following fig.1 and fig.2 explain how this can be calculated.



Refer to fig. 2,  
 8ft = 2.66m = 2.66x10<sup>9</sup> nm  
 6ft = 2m = 2x10<sup>9</sup> nm  
 Height of nanoman = 100nm  
 No. of years required to reach height of man to 100nm,  
 $[2.66 \times 10^9 - 100] / (x + 400) = [2 \times 10^9 - 100] / x$   
 [Similarity of triangles]  
 X=1212yrs.  
 Considering error- like in spite of linear relation between [y and t] curve may be parabolic or hyperbolic or something different.  
 So in next 2000yrs the man size will be definitely 100nm. Exploring the same idea to develop 'nanoman' in next few pages by using biological and mechanical concepts.

Nano/Micro Electro Mechanical Systems

Smart matter is another term for micro-electromechanical systems (MEMS), a technology that combines computers with tiny mechanical devices such as sensors, pumps, valves, gears, mirrors, and actuators embedded in semiconductor chips. Microelectronic integrated circuits can be thought of as the "brains" of a system and MEMS do this decision-making capability to allow microsystems to sense and control the environment. The development of field of CNTs, fullerenes and synthesis, fabrication and processing of Nano materials by the various ways is possible and various researches in this filed will be useful to make this idea realistic. The development of nanostructure material for solar cell is again a natural fuel source for Nano man.

Sensors Based on Nanostructured Materials: The many different techniques and methods of fabricating materials on the nanometer scale and specifically, the utilization of these resources with regard to sensors. Sensors based on carbon nanotubes and fullerenes, Non-carbon nanotubes arrays, Nanowires, noncoms, Nano belts, Nano rods, and nanoquids, Metal oxides and semiconductors: Nano templates, nanowires and Nano crystals, Quantum Dots, Nanostructured magnetic sensors, Encapsulated probes, Optical fiber sensors based on nanostructured coatings, Nanostructured sensors on flexible substrates.

IV. SELECTIONS OF PARTS AND REPLACEMENT [REFER FIG. 3 'NANOMAN' IN APPENDIX]

Following table 1 shows how the parts of human body are replaced by mechanical, electrical or electronic systems [Nano sized and using nanomaterial]

Materials and methods [refer fig. 3 'Nano man']

Nano materials are with some special properties:

1. Can withstand with high heat
2. High Strength
3. Chemically not reacted with any liquid
4. Can be processed by available Nano fabrication techniques
5. This is possible by using CNT's and fullerenes
6. A nest of the CNTs is circulated through whole body, which is the continuous source of energy for Nano man.
7. The fuel need can be satisfied by cell energies in the body or by solar energy or by using hydrogen.
8. A composite nanomaterial are suitable material where required adjustments are possible.

Table: 1

S. N.	Parts of human body replaced by		
	Parts	Mechanical system	Electronic System
1.	Brain	-	Memory cards and computers,
2.	Human senses – nose, ear, eyes	temperature sensors, Sound system	Cameras, Nano sensors, etc.
3.	Lungs	Fuel tanks	Nano chips
4.	Heart	Nano pump	Electronic Mixer
5.	Stomach	Combustion chamber	MJTs
6.	Liver	Thermoelectric generator	MEMS generators
7.	Large/ small intestine	Regenerator of fuel	CNTs, Fullerenes
8.	Capillaries	tubes for fuel flow	Nanowires, rods for electron flow
9.	Joint of legs, hands and movements	gears, mechanical joints etc.	Servo meters, Nano gears, pump, valve, mirrors
10.	Blood	-	Electron

		current, flow
11.	Exhaust of hot gases [combustion chamber ] runs the generator and then passed away through regenerator and if needed can be passed through nozzle for flight purpose	

Methods: [techniques used]

- Fuels generally are regenerative type.
- In combustion chamber, electronic bombarding / nuclear chain reactions or similar methods can be used to generate heat.
- Thermoelectric generators develop DC powers, as well as has provision to store electric power.
- Regenerators generates the fuel from exhaust product [after combustion-need research].
- CNTs are used to store fuel.
- Solar Nano materials are used the store solar energy.
- A system is needed which will develop energy from body cells or blood without effecting them
- Heat exchanger 1 and 2 are used to increase the heat of the fuel before it enters the combustion chamber.

### V. WORKING [REFER FIG. 'NANOMAN' IN APPENDIX]

1. Fuel/ reactors are filled in the tank. [Opening at Mouth]. CNTs with hydrogen and Solar nanomaterial cells with fully charged.
2. Air for combustion is taken from the nose or may be stored in fuel tank.

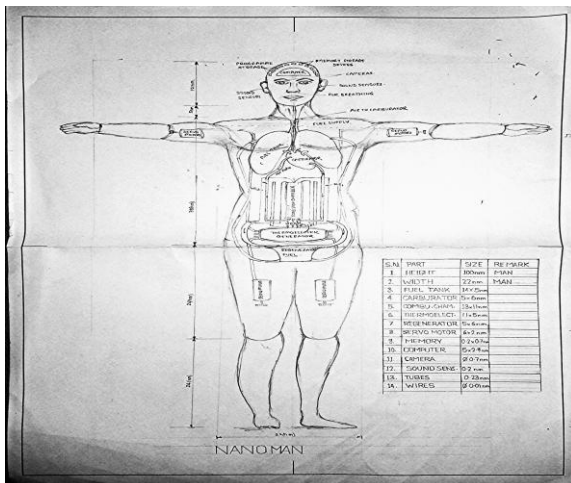


Fig. 3

3. Mixer cum pump mixes air, fuel and other reactors or energizers of the process and creates the pressure difference.
4. The mixed fuel passes to combustion chamber and heated in Heat exchanger in such way that immediately it gets ignited without any spark. [spark is needed at the time of starting only – starter]
5. Burned gases are then passed to thermoelectric generator and generates the electricity [partly stored and partly utilized] which will replace the blood. It provides electrical power required to all drives and computers filled inside nanoman.
6. Exhaust gases can be regenerated and fuel gets formed.
7. Partly the gases are used for flight purpose like rocket engine, passing through nozzle at legs, so nanoman can fly.
8. Refer fig.7 in Appendix for further details.

### VI. USES AND APPLICATIONS

#### 1. Medical

- Can enter inside the body of the human and kill the viruses.
- Can damage the system of the enemies.
- Can do small operations
- Complete inside scan of body.
- Act as drug, and reaches at place where it is difficult to operate
- The operations without any cut, stitches will get possible.

#### 2. Computer Engineering

- Can act as virus or antivirus for computers.

#### 3. Mechanical Engineering

- Useful in processes like Ion beam machining, laser machining, material testing.
- Useful to understand the Nano materials and its structure. To change the structure at specific point.

#### 4. Defense

- Can corrupt and uncorrupt the data on computers.
- Can change the programs of missiles, or new technology weapons.

#### 5. Changing structures of materials

#### 5. Electronics engineering

#### 6. Electrical engineering

#### 7. Civil engineering

#### 8. Agricultural engineering

- Used for proper growth of plants
- Killing germs and detection.

### VII. FUTURE WORK

-As the Nano man is an idea, which is a device based on nanotechnology still lot of work is needed to develop it. It may be realized or a real world model after 5yr, 10yrs or next 100yrs.

- This device based on today's nanotechnology development and research, a design which covers most of the Nano techniques. A device to solve future problems and to make human life better.

- A research is still required in following directions

- i) Needs fuel which is regenerative,
  - ii) Nano manufacturing of device,
  - iii) Suitable materials for Nano body like composite but multipurpose.
  - iv) Good capacity devices, storage problems.
- iv) These few pages only explain the idea and lot of work is needed to bring it into practice.

### VIII. SUMMERY AND CONCLUSION

-Growth in technology and comforts to mankind is effecting on the height, width and weight of today's human.

- If it is true, then the time will come after 2000yrs that the height of man will be Nano meters.

- A Nano size man can be developed by using electromechanical devices.

- It can used in fields like agricultural, material sciences, engineering, medical etc.

- This paper explains an idea to develop such a device.

- A lot of work is needed in material selection, Nano

manufacturing, replacing the methods which are not practicable, internal circuit's arrangement and many other conceptual things to bring this idea into practice.

- 'Nanoman' if it is developed will solve many problems of mankind in the field of engineering, medical, agricultural and other.

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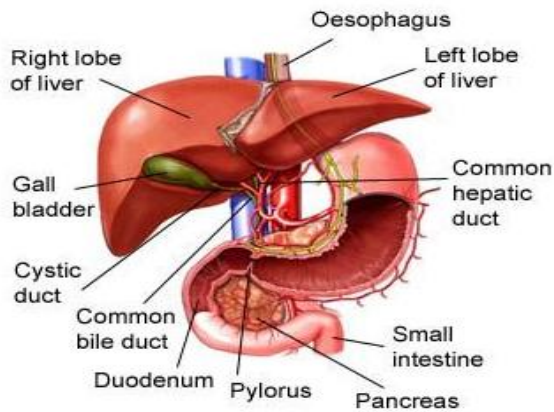
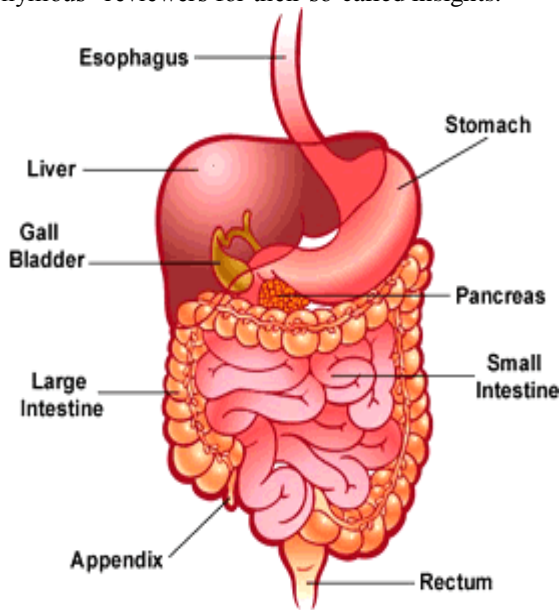
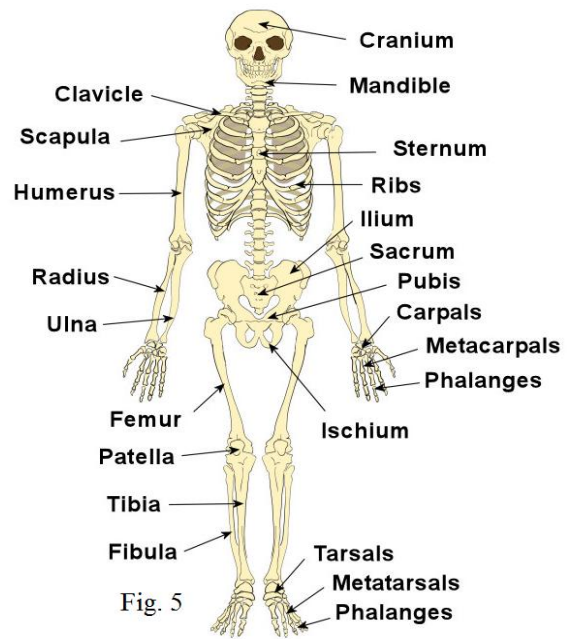


Fig. 4

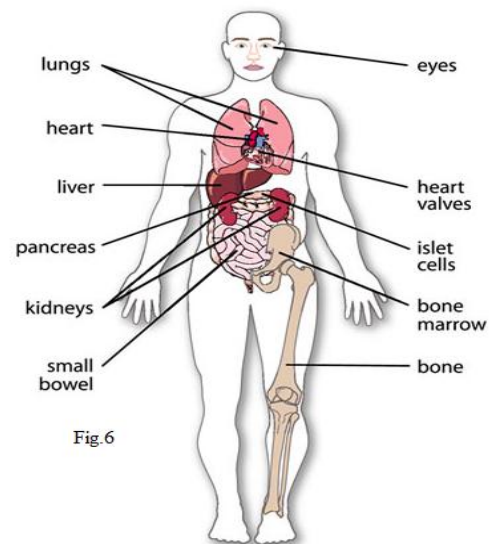


Fig.6

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*APPENDIX*

- Digestive System fig. 3 and 4
- Man Skeleton fig.5
- Man structure fig. 6