MACHINE HUB NEPAL

MACHINE HUB NEPAL PRIVATE LIMITED

Address: Baluwatar, Kathmandu, Nepal Email: info@machinehubnepal.com

Website: www.machinehubnepal.com

Ref. No.: 20770107/1

Date: 20th April, 2021

TO WHOM IT MAY CONCERN

This is to notify that **Mr. Sarozh Maharjan** has been appointed for the designation of **Mechanical Design Engineer** in the company **Machine Hub Nepal Pvt. Ltd.** since 12th August, 2019. Since there is no contract signing or MOU between him and the company regarding the time period of his appointment, there won't be any legal objection against him for quitting his job at any time.

The key duties and responsibilities assigned to him can be pointed as:

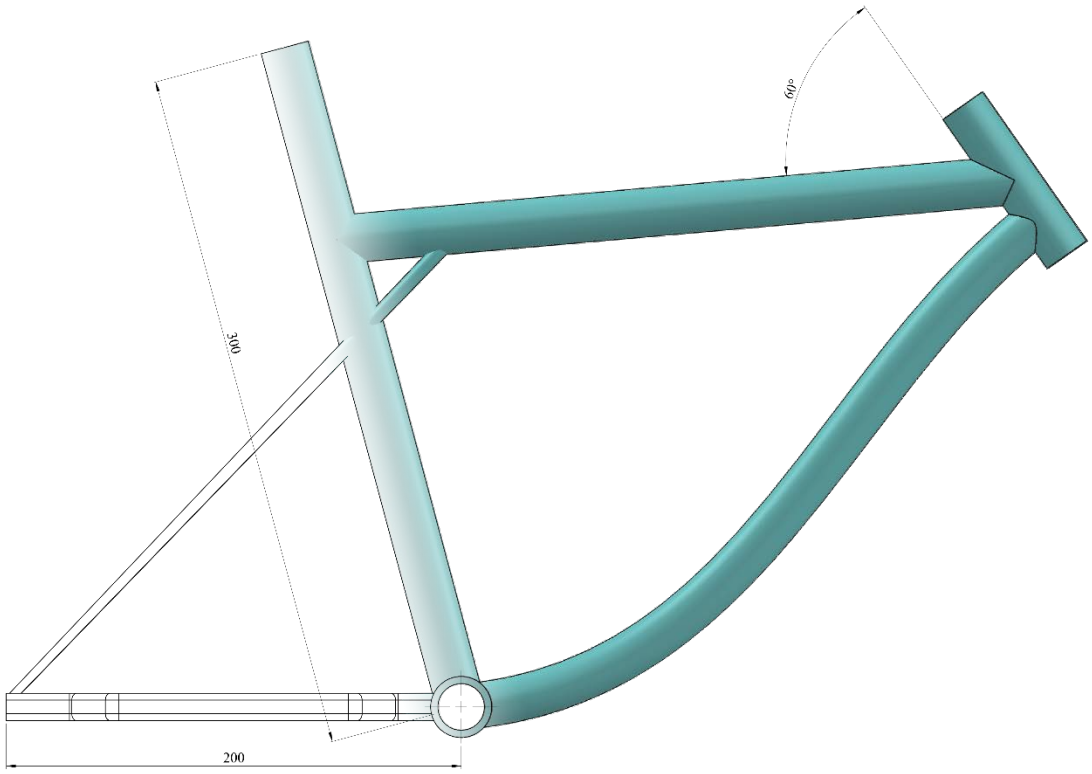
1. Creating CAD models, reverse engineered systems and iterating with digital prototypes of machine/components esp. CSEB Interlocking Brick Machines, Allo (Himalayan Nettle) Processing Machines, Egg Incubators, and other Agro-Machineries in SOLIDWORKS.
2. Providing engineering and workshop drawings (Computer Aided Drafting) of all components of the machines to be manufactured.
3. Creating Bill of Material (BOM) and, material and cost estimation of the machines to be manufactured in SOLIDWORKS and MS-EXCEL.
4. Providing basic mechanical fabrication and drawing supervision to foremen (welding, filing, cutting, grinding, drilling, labelling, machining techniques, etc.)
5. Space and scrap management of polyurethane panel and MS/GI sheets (for Egg Incubator).
6. Creating designs for manufacturing and assembly, and models for 3D printing.
7. Producing preliminary and conceptual designs (pencil sketching).

The distinct characters observed during his appointment can be pointed as:

1. Perfectly skilled, efficient and prompt user of SOLIDWORKS for 3D modelling, 2D drawings (drafting), reverse engineering and design iterations.
2. Efficient files and data managing, handling, storing and processing on both computers and desk.
3. Independent researcher and creative content creator regarding designs, mechanism developments and article writings.
4. Punctual in assigned tasks and office timing.
5. Effective and commanding communications.
6. Honest, obedient, loyal, responsible, ethical, trust-worthy and inspiring.

For further queries and doubts, you are always welcome to write or call me and I would be glad to recommend him. I wish him having bright and successful future ahead.

Sanjiv Paudel
Managing Director
Machine Hub Nepal Pvt. Ltd.
(+977) 9856052577, (+977) 9851181127
info@machinehubnepal.com



SAROZH'S DESIGN PORTFOLIO

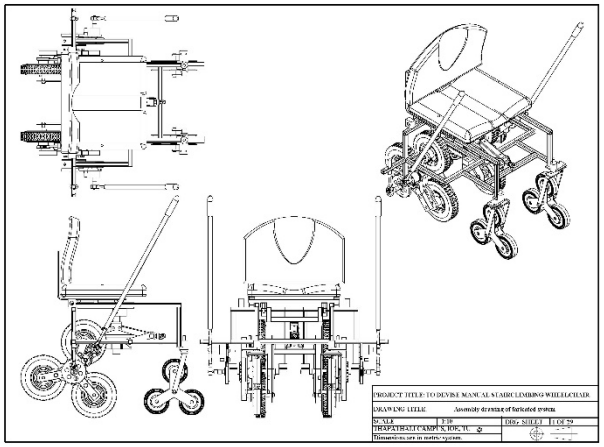
thesarozh@gmail.com
(+977) 9808885848

OBJECTIVES

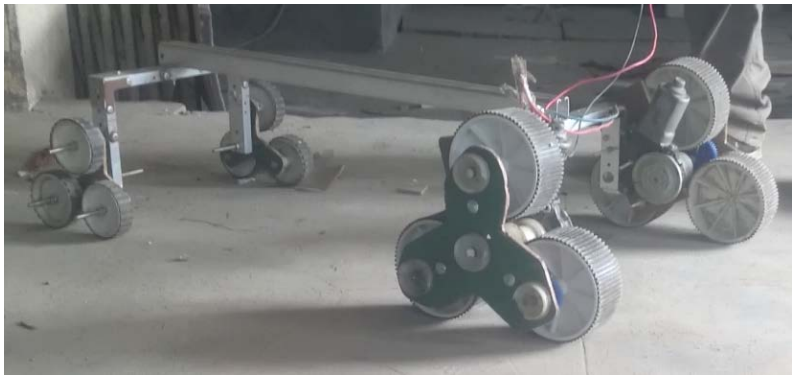
The main objective is to design, fabricate and test manual stair climbing wheelchair with lever propulsion with specific objectives:

- To make mobility of disabled person easier.
- Adopt the designed wheelchair with stair climbing mechanism and its accessories.

COMPUTER AIDED DESIGN



MODEL FABRICATION AND TESTING



PROTOYPE FABRICATION AND TESTING

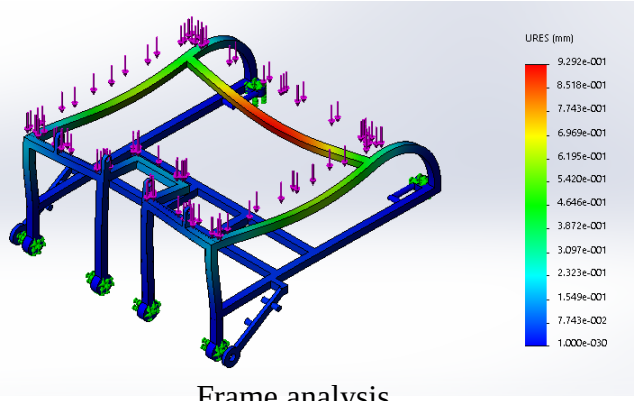
Rear wheel planetary gear

Horizontal seat at stair

Test at stair.

Final Prototype

Test at slope.



Frame analysis

OUTP UT

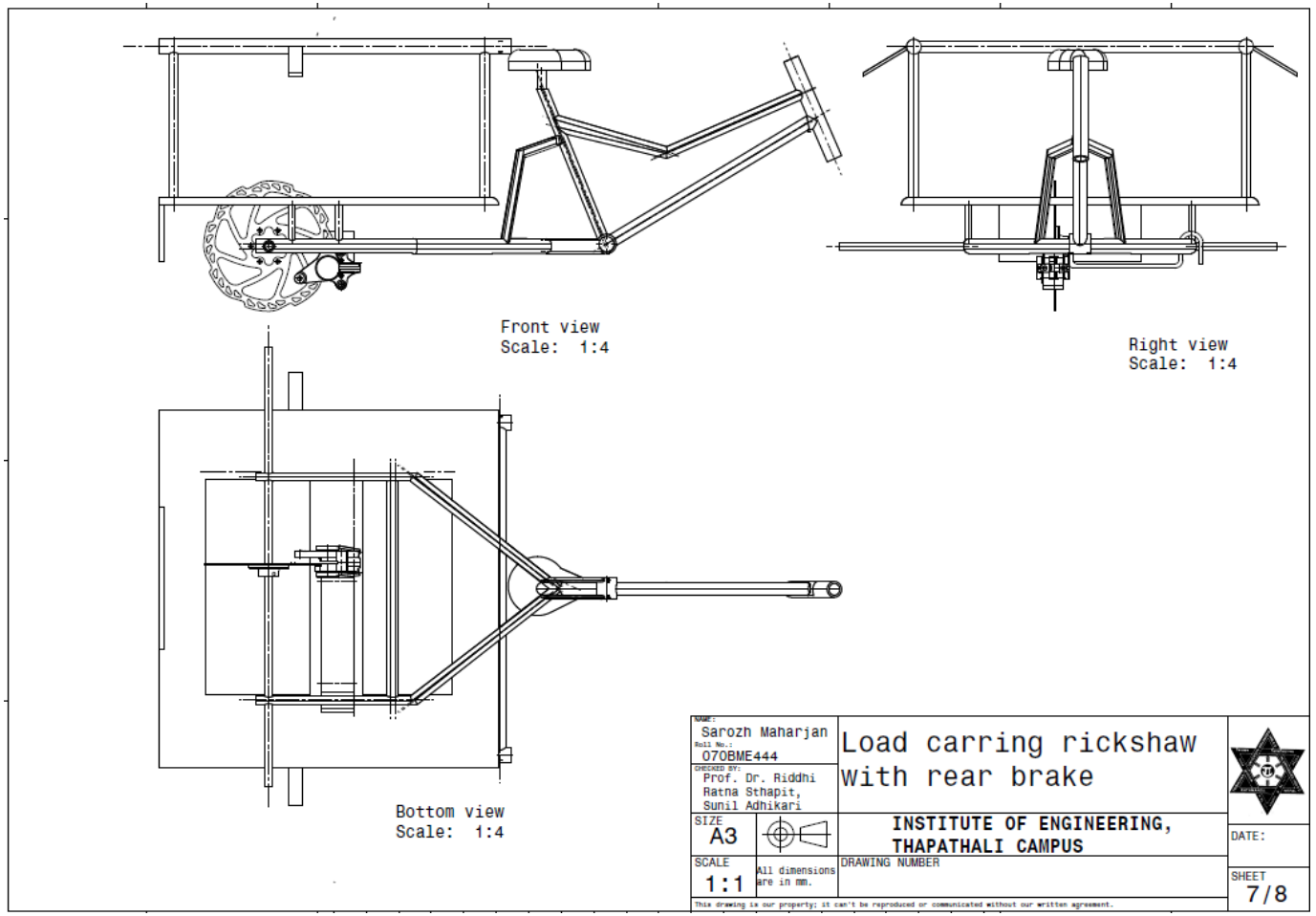
Three test subjects i.e., 2 boys and a girl of weight 21.6 Kg, 30.3 Kg and 25.3 Kg respectively were called upon for test and the project finally concluded with following:

1. The project involved use of existing Tri-Star arrangement with planetary gear mechanism and leveraged driving mechanisms, which is found to be suitable for levelled ground, inclined surfaces and stair climbing purposes.
2. The user (not disabled) of weight 60kg is able to climb himself up a single stepped stair of rise and run of 160mm and 300mm without assistance.
3. On levelled ground, the wheelchair is slower than the existing wheelchairs due to lack of speed changing mechanism.
4. Poor effectiveness is caused due to flaws in components and techniques used.

3 Manual Stair Climbing Wheelchair (Contd.)

OBJECTIVES

Rickshaw, one of the forms of transport and employment, does not seem to have an efficient braking system. The front brake is seen not working in many cases so drivers use their feet to press the rotating front wheel to stop the moving rickshaw. No rear brake is obviously a serious safety problem.



Main Objective

- To make mobility of cycle rickshaw **safer** with effective braking system.

Specific Objectives

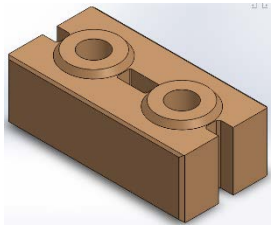
- To design effective braking system in cycle rickshaw.
- To adopt it with present cycle rickshaw and its accessories.

Expected Outcome

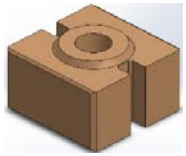
- The best suitable brake is **disk brake** due to its **high efficiency on grip, wear resisting metal body, heat and dirt losing pores,** etc.
- Disk brake system is cheap to install on the rickshaw. The extra tasks to be done are:
  - Making disk brake holder
  - Making brake caliper holder
  - Selecting an appropriate bearing
- Development of **effective** and **affordable** braking system in cycle rickshaw with **necessary braking efficiency** and **easy repair and maintenance**.

CSEB

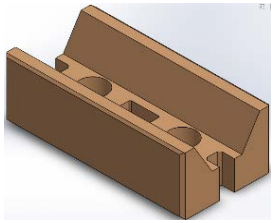
Compressed Stabilized Earth Brick (CSEB) is a building material made by compressing the mixture of sand, clay and aggregate/cement at high pressure using any mechanical press forming a definite sized block. Around 21 MPa (3,000 psi) is applied in compression reducing the volume by about half.



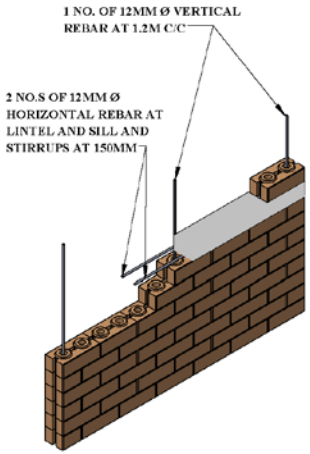
Interlocking (Full) Brick



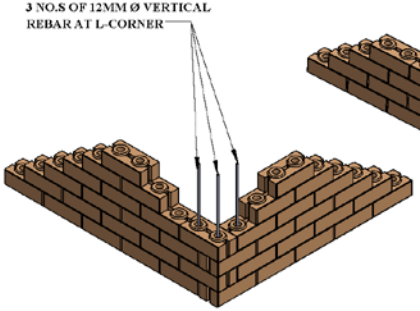
Interlocking Half Brick



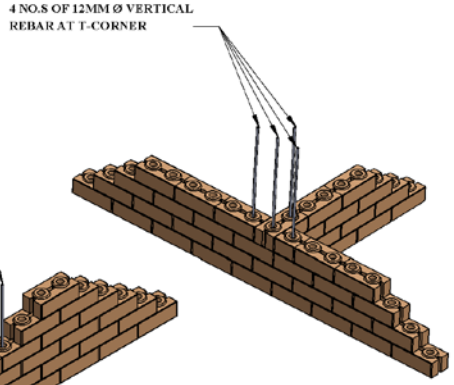
Interlocking U - Brick



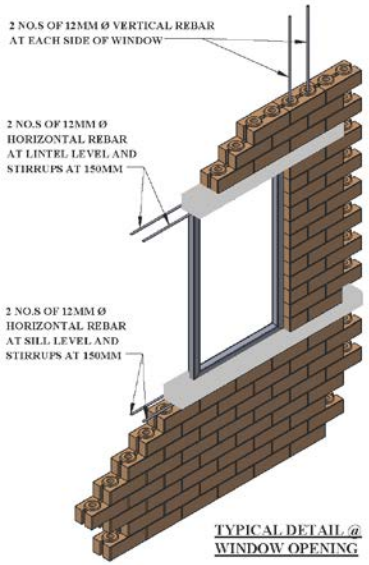
TYPICAL DETAIL OF WALL



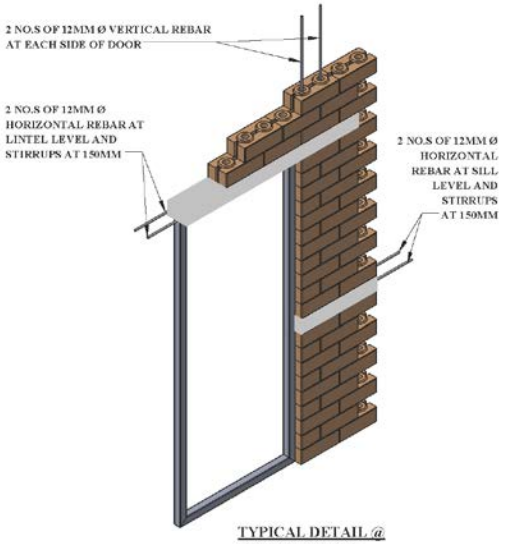
DETAIL A
TYPICAL DETAIL OF L-CORNER



DETAIL B
TYPICAL DETAIL OF T-CORNER



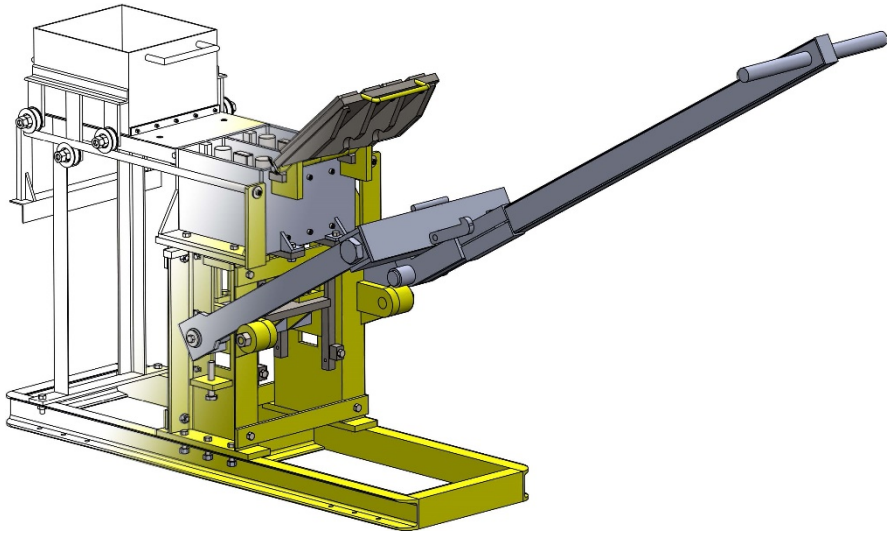
TYPICAL DETAIL @
WINDOW OPENING



TYPICAL DETAIL @
DOOR OPENING

INTERLOCKING BRICK MASONRY TECHNICAL GUIDELINES

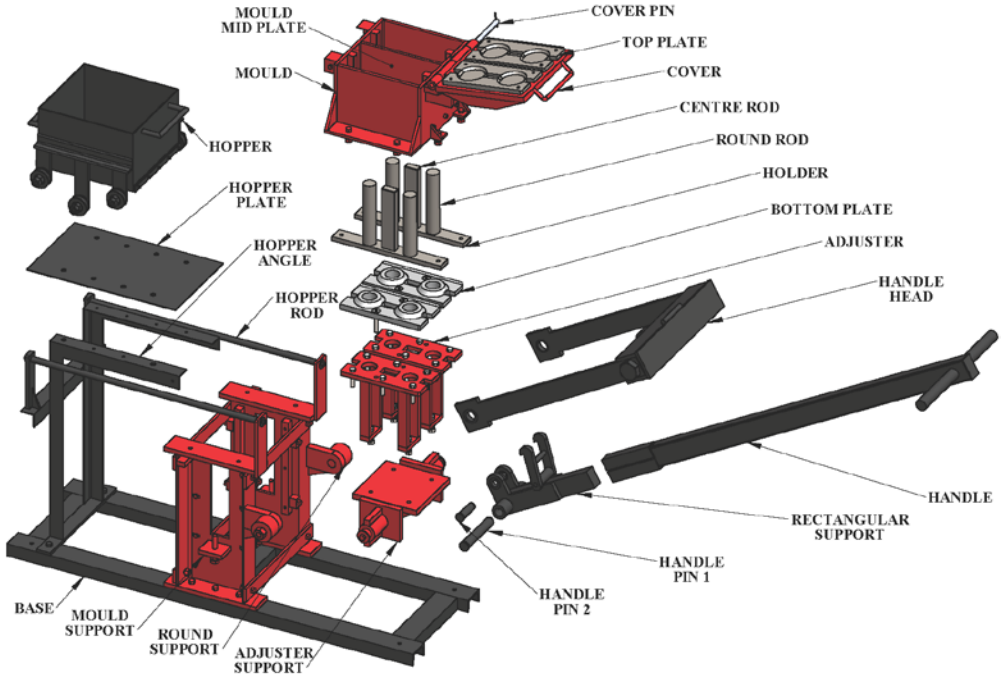
DOUBLE MOULD



Producing two bricks of dimension 300 x 150 x 100 (mm) each at a time, this double mould machine reduces the volume of mixture of sand, clay and aggregate/cement by 1/1.7 times.

This machine is capable of producing interlocking bricks 600 - 800 pieces per day.

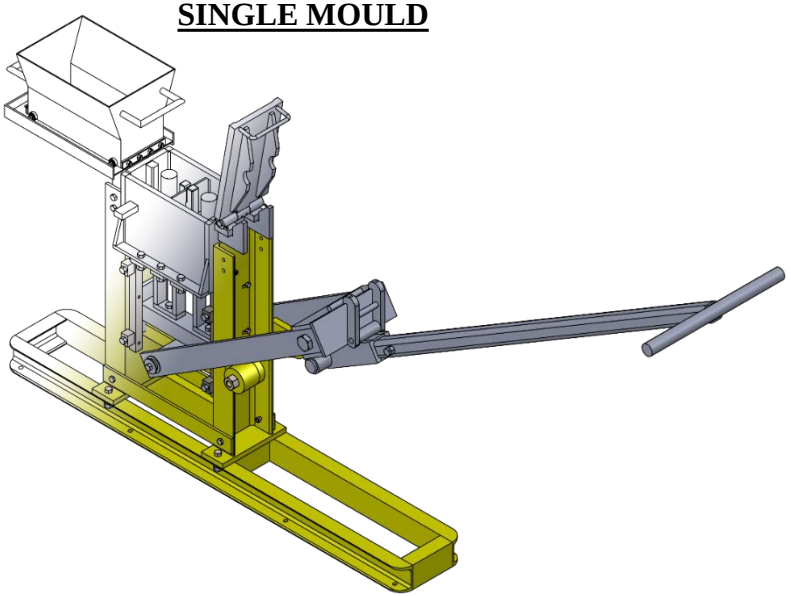
FABRICATED PRODUCT



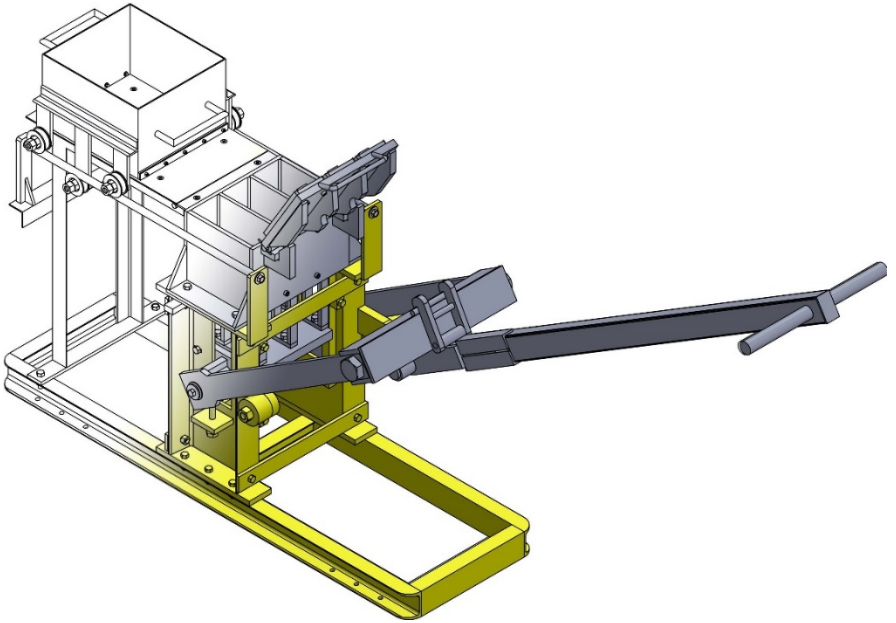
EXPLODED VIEW (for customer)

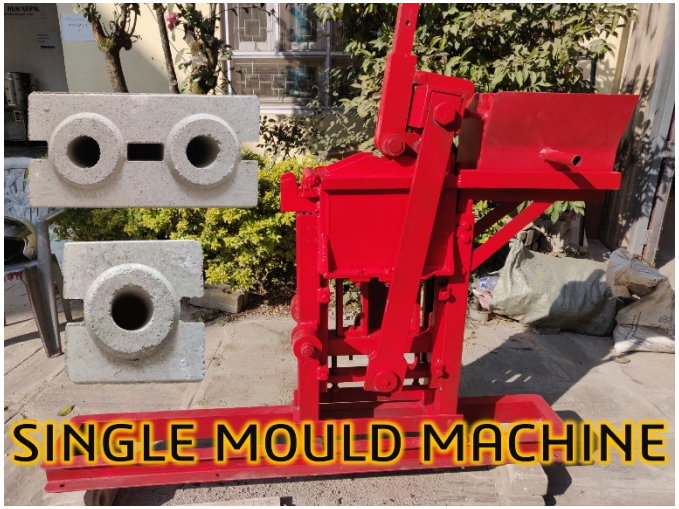
CSEB Interlocking Brick Machine

SINGLE MOULD



TRIPLE MOULD





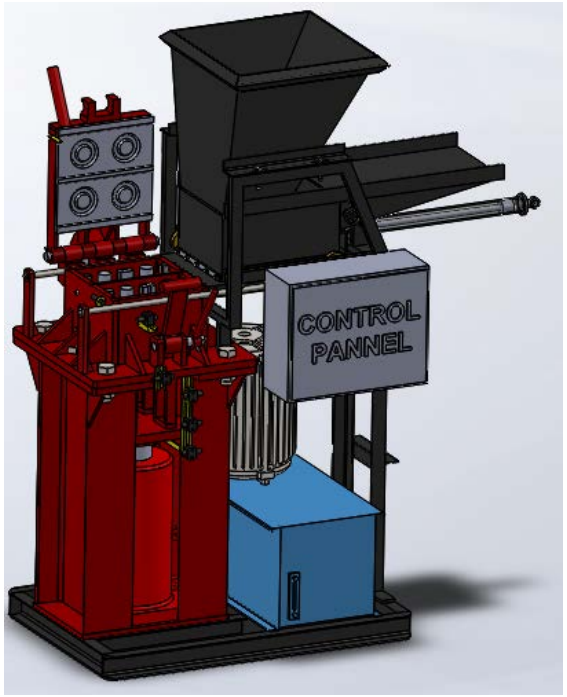
FABRICATED PRODUCT

Single mould machine produces single brick of dimension 300 x 150 x 100 (mm) at a time, with the same mixture and same compression while the triple mould is capable of producing the brick of dimension 9 x 4 x 4 (in.)

Single mould machine is capable of producing single brick of dimension 300 x 150 x 100 (mm) 300 - 450 pieces in a day while it is 900 – 1200 pieces for Triple Mould Machine .

7 CSEB Interlocking Brick Machine (Contd.)

FULL OR SEMI AUTOMATIC



Modifying the double mould machine for interlocking brick making of the same dimension 300 x 150 x 100 (mm) two at a time, **full automatic machine** has been taken to next level by making all the manual processes to automatic with effective control system.

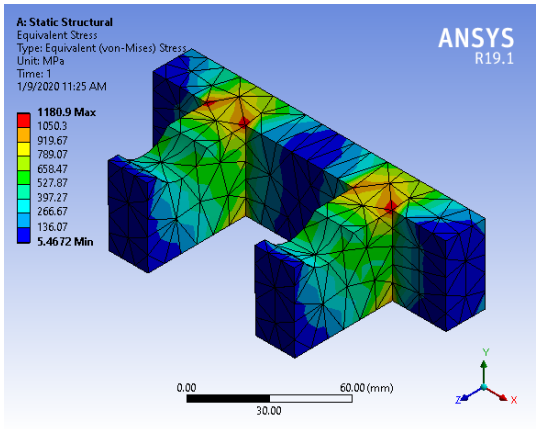
The main features are:

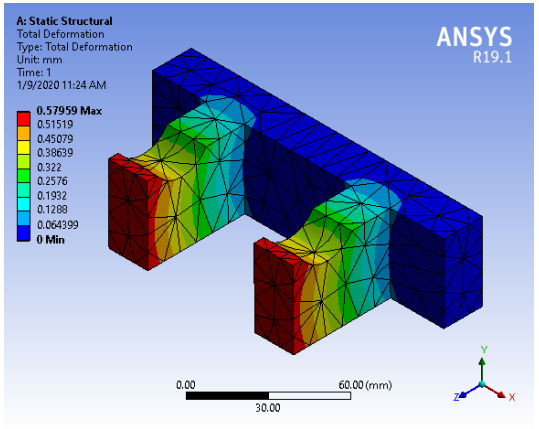
- Automated hydraulic system for mixture compression
- Automated cover open/close hydraulic system
- Automated hopper hydraulic system

A lower version of full automatic is **semi-automatic** in which lever is used in replacement of control system.

Expected Outcome

Making this machine automatic is expected to each entrepreneur to produce interlocking bricks 1500 - 2000 pieces per day.





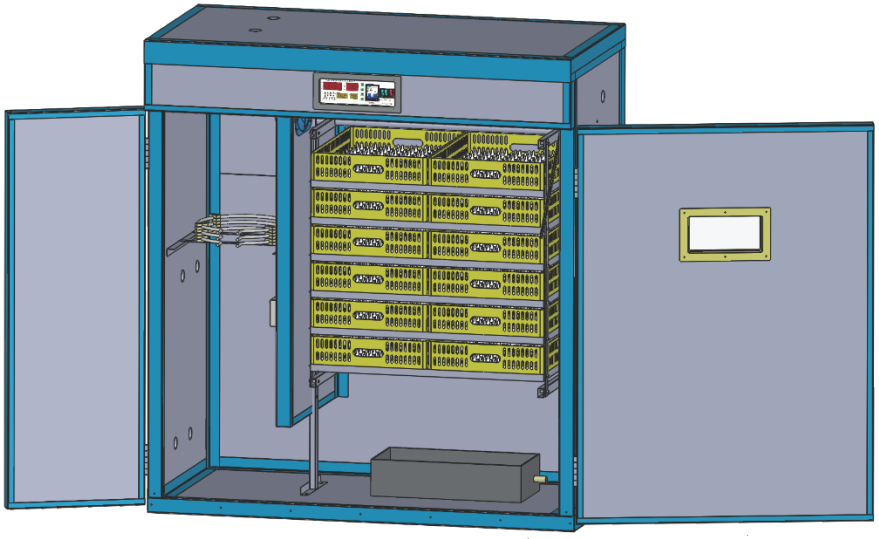
Von-Mises Stress and Deformation with 35 ton force applied.

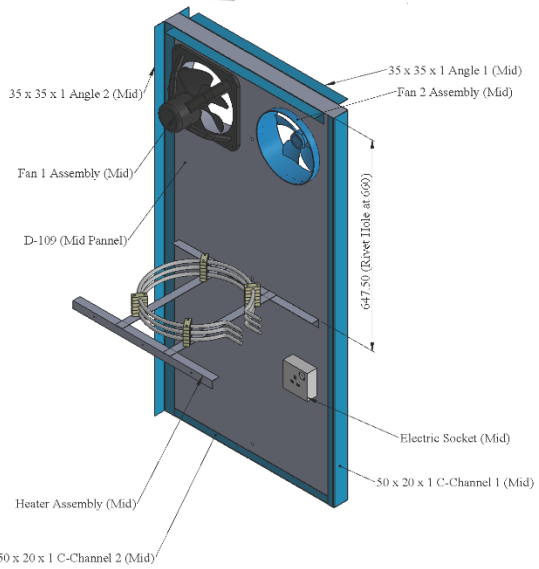
FULL AUTOMATIC (WITH CONTROL SYSTEM)

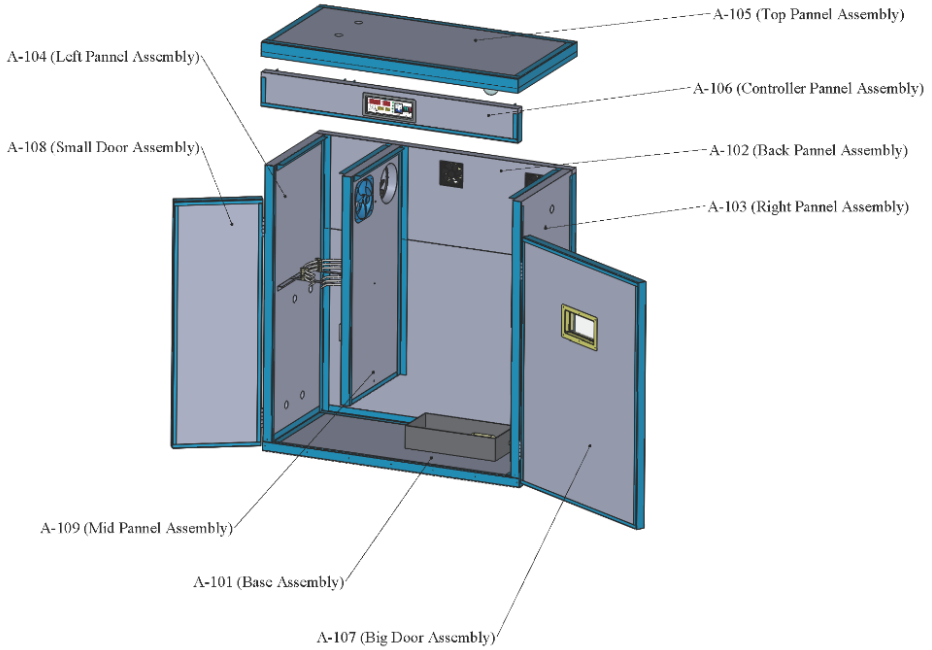
SEMI AUTOMATIC (WITH LEVER SYSTEM)

INCUBATOR CAPACITY: 1056 EGGS

Incubation is simply getting out a chick from an egg. The artificial machine which keeps eggs warm at a particular temperature range and in the correct humidity with a turning mechanism to hatch them is referred as incubator or hatchery machine.

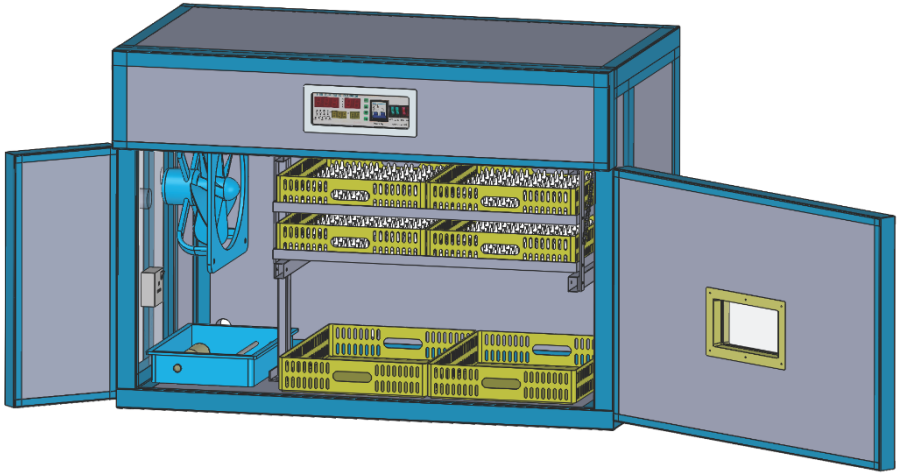


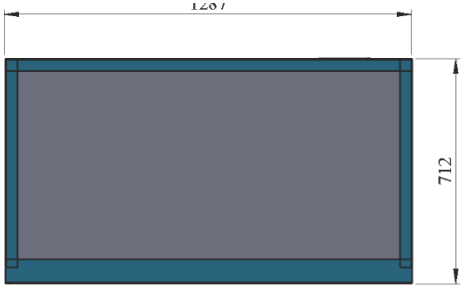




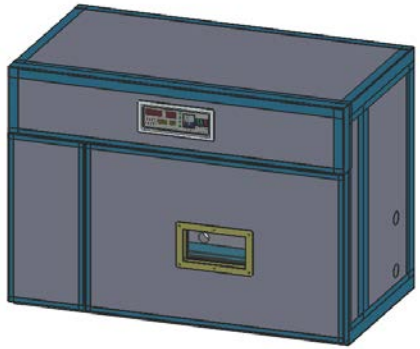
PART NUMBER	DESCRIPTION	QTY.
D-109 (Mid Pannel)	1200 x 600 x 50	1
50 x 20 x 1 C-Channel 1 (Mid)	L = 1200	1
50 x 20 x 1 C-Channel 2 (Mid)	L = 601	1
35 x 35 x 1 Angle 1 (Mid)	L = 530	2
35 x 35 x 1 Angle 2 (Mid)	L = 1200	2
Fan 1 Assembly (Mid)	Model:FAD20-4; 220V~; 28W; Blade Ø: 200mm 13m³/min	1
Fan 2 Assembly (Mid)	1056	1
Heater Assembly (Mid)	1056	1
Electric Socket (Mid)	86 x 86 x 32	1

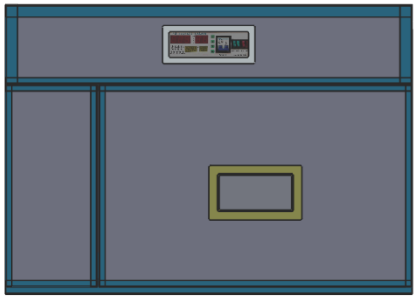
INCUBATOR CAPACITY: 352 EGGS



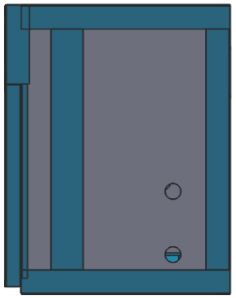


TOP VIEW

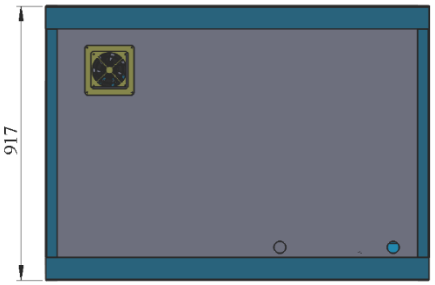




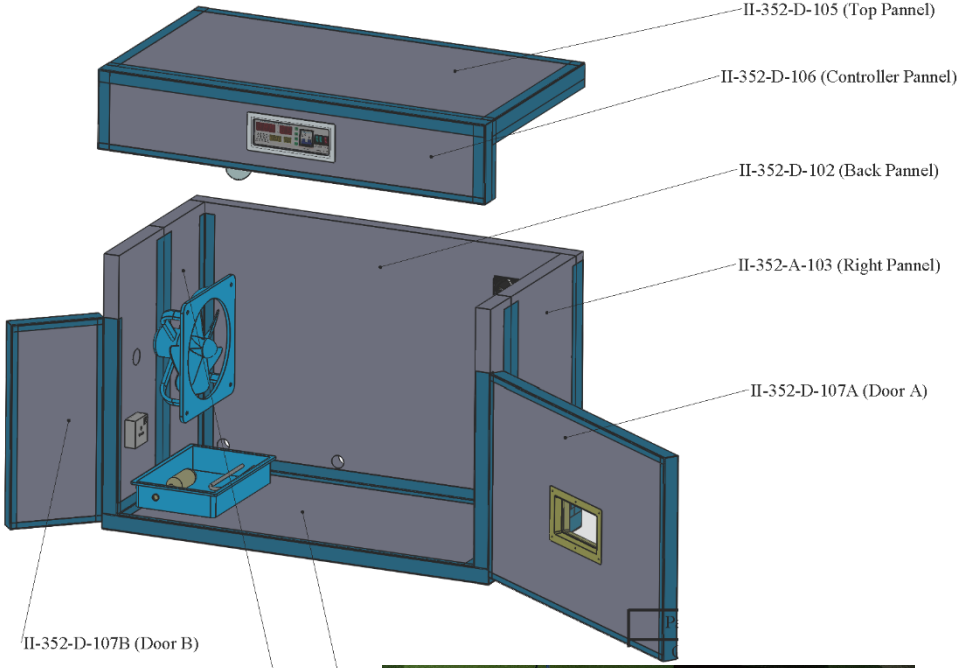
FRONT VIEW



SIDE VIEW

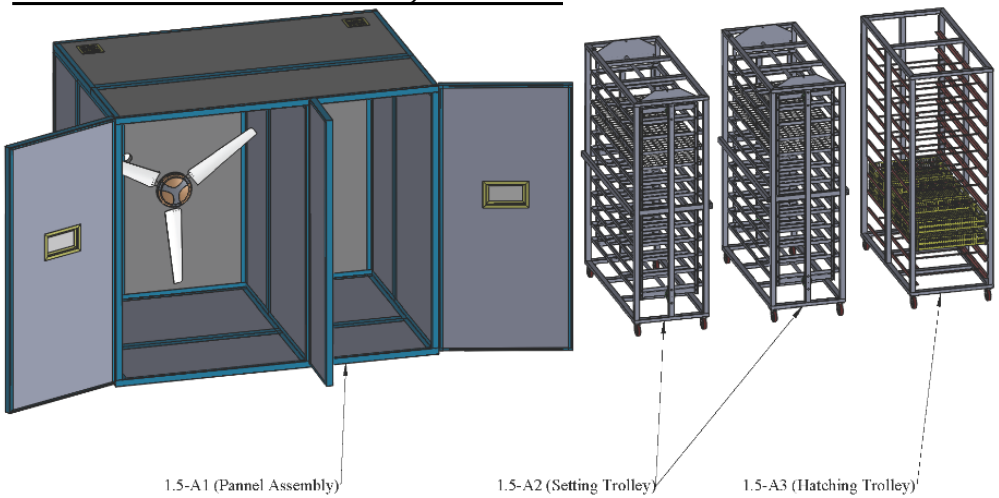


BACK VIEW

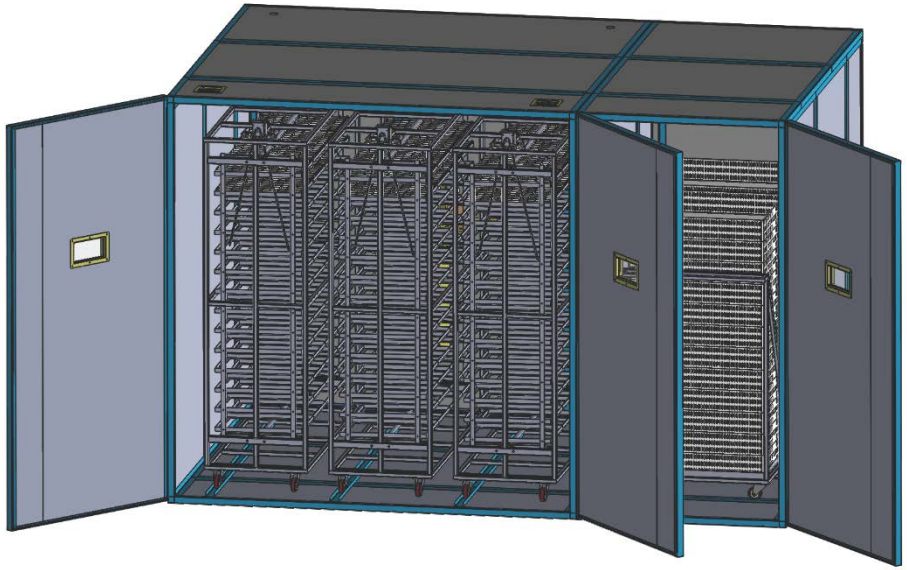


FABRICATED PRODUCT

INCUBATOR CAPACITY: 6,336 EGGS



INCUBATOR CAPACITY: 14,784 EGGS



FABRICATED PRODUCT

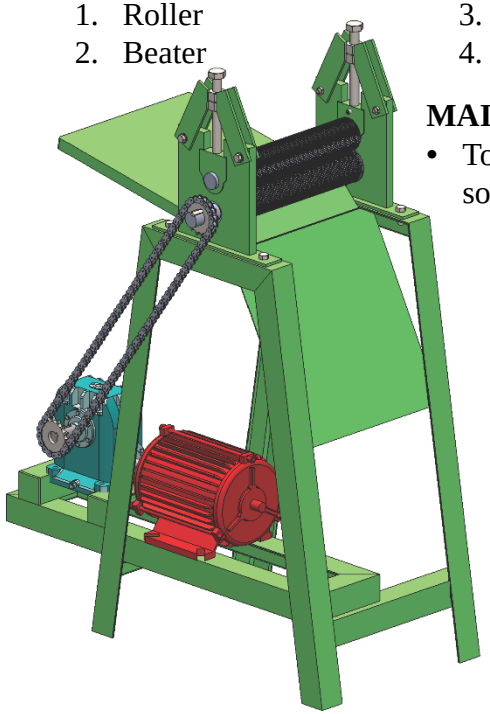
Allo or **Himalayan Nettle** is 1.5 to 3 metres perennial herbaceous shrub, that abundantly grows without cultivation in open forest land, river sides, and moist habitat in Nepal and in Himalayan region at elevations between 1,200 to 3,000 metres.

The stem bark of Allo contains fibre with unique strength, smoothness, light weight and silk-like lustre. The fibre can be processed to make clothes, bag, shoes, etc. which are commercially traded all over Nepal. Traditionally, Allo is processed to make jacket, porter's head band, rope, fishing nets, blankets, etc. in remote vilages of Nepal.

Processing Allo

The stem bark of Allo processing requires major four steps and thus four machines viz.

1. Roller
2. Beater
3. Hackle
4. Charkha



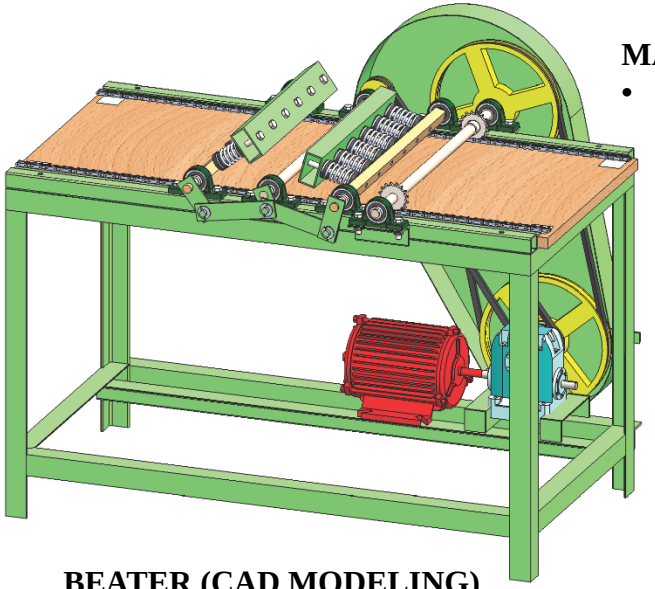
ROLLER (CAD MODELING)

MAIN FUNCTION OF ROLLER

- To press the hard stem of Allo through its two rolling knurled cylinders to make them softer.

FABRICATED PRODUCT

Allo (Himalayan Nettle) Processing Machine

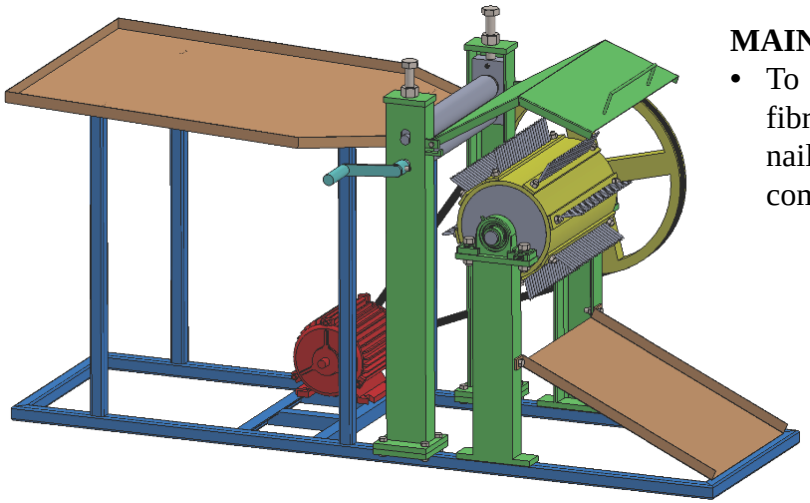


BEATER (CAD MODELING)

MAIN FUNCTION OF BEATER

- To beat the soften stem of Allo using its two beating hammer using linkage mechanism to make them even softer and flat.

FABRICATED PRODUCT



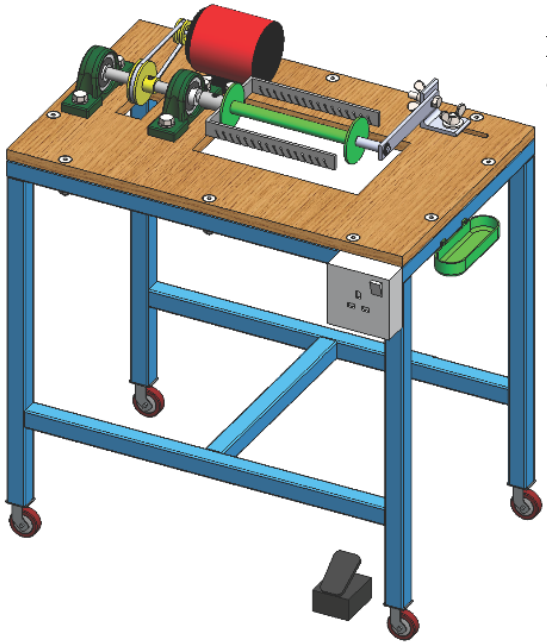
HACKLE (CAD MODELING)

MAIN FUNCTION OF HACKLE

- To smoothen and untangle the soften fibre of Allo using its various pointed nails (like untangling hair using a comb).

FABRICATED PRODUCT

Allo (Himalayan Nettle) Processing Machine

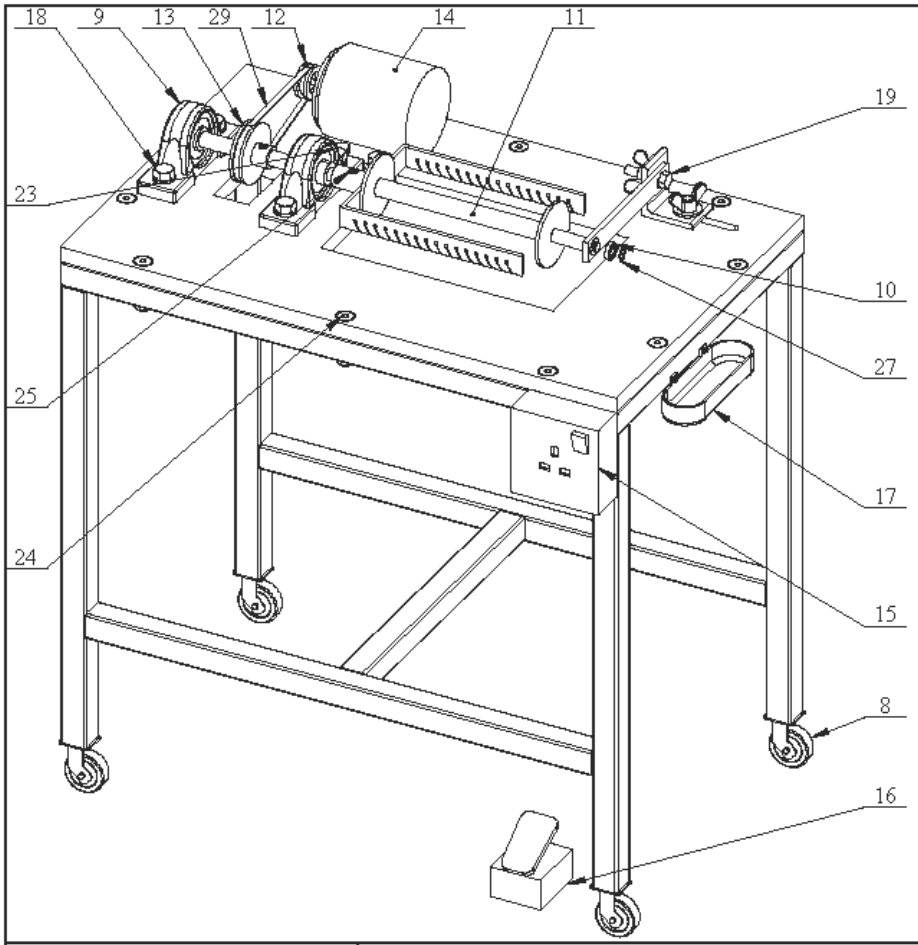


CHARKHA (CAD MODELING)

PRODUCTS MADE FROM ALLO

MAIN FUNCTION OF CHARKHA

- To extract, spin and collect the yarn or thread from the fibre of Allo using its motorized spindle and bobbin.

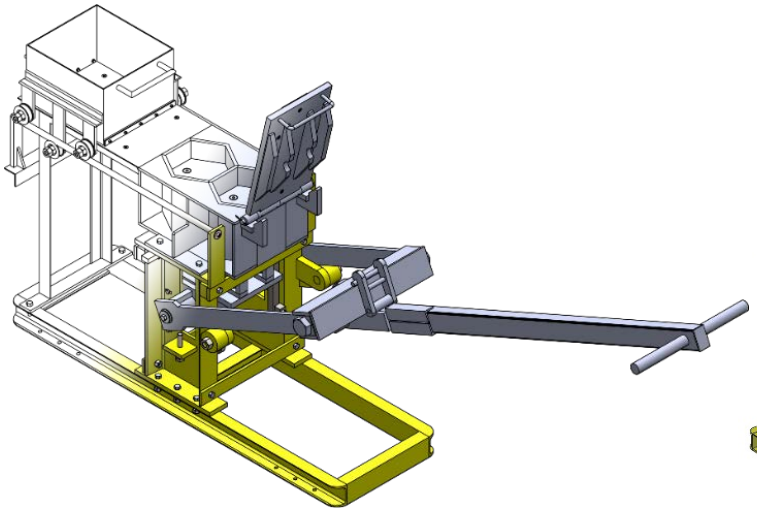


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
8	Charkha 1.5in. Wheel Asssembly	1.5"	4
9	Bearing	UCP 200; Ø12	2
10	Bearing	618/8; 8 x 16 x 4	1
11	Bobbin		1
12	1" Pulley (Charkha)	1"	1
13	3" Pulley (Charkha)	3"	1
14	Sewing Motor (Charkha)		1
15	Charkha Switch	86 x 86 x 32	1
16	Pedal Potentiometer		1
17	Water Case		1
18	Bolt Nut Washer	M10 x 40	4
19	Bolt Wing Nut Washer	M8 x 35	2
23	Bolt Nut Washer	According to Motor	4
24	CSK Allen Bolt Nut Washer	M8 x 50	10
25	Set Screw	M8 x 10	2
27	Circlip	DIN 471;8 x 0.8	1
29	Belt	340mm	1

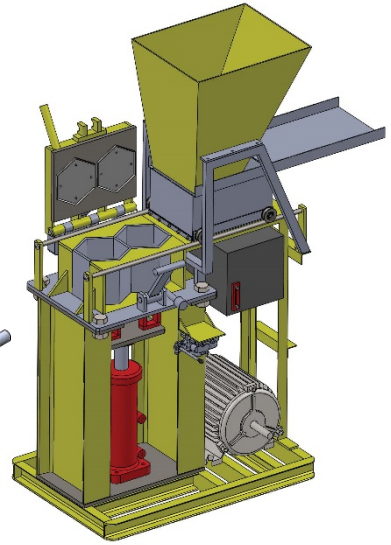
MACHINE HUB NEPAL Baluwatar, Kathmnadu Nepal	Charkha Assembly			Charkha Assembly Components	
	Quantity 1	Material Q235		*All dimesnions are in mm.	SHEET 4 OF 12

14 Allo (Himalayan Nettle) Processing Machine

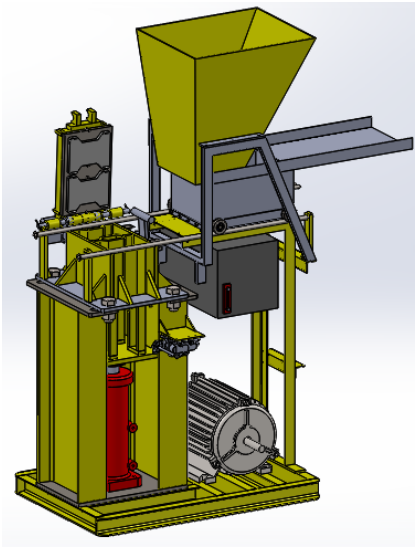
PAVING BRICK MACHINE helps to produce paving bricks/blocks that can be of various shapes and sizes. For example, hexagonal paver, I Dumble paver, etc.



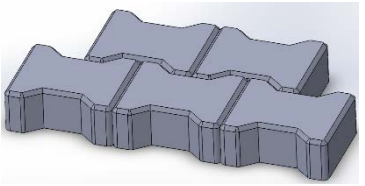
HEXAGONAL PAVER MACHINE (MANUAL)



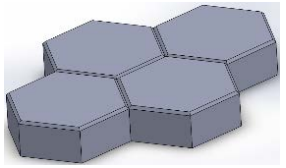
HEXAGONAL PAVER MACHINE (HYDRAULIC)



I DUMBLE PAVER MACHINE (HYDRAULIC)



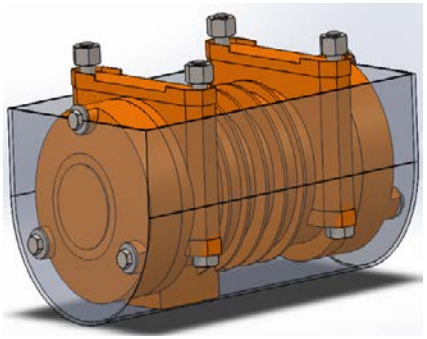
I DUMBLE PAVER



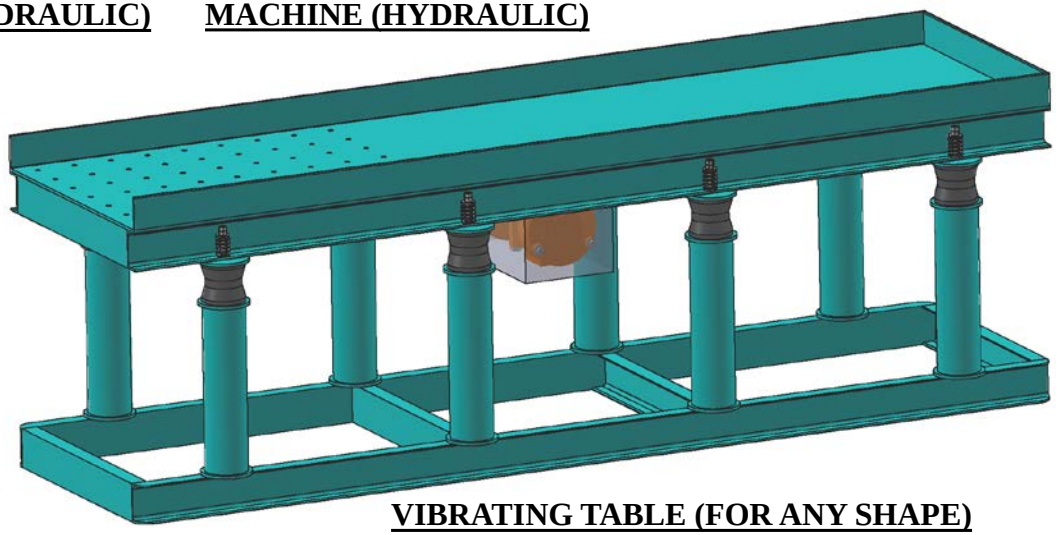
HEXAGONAL PAVER

PLASTIC DIE

VIBRATING TABLE uses some plastic dies of any shaped paver block, in which mixture of concrete or aggregate is placed and vibrated well enough to get a desired paving.

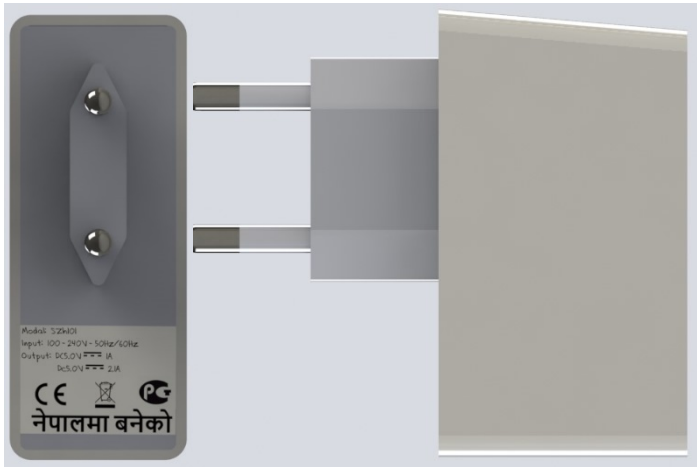


VIBRATING MOTOR FOR VIBRATING TABLE



VIBRATING TABLE (FOR ANY SHAPE)

MOBILE PHONE CHARGER

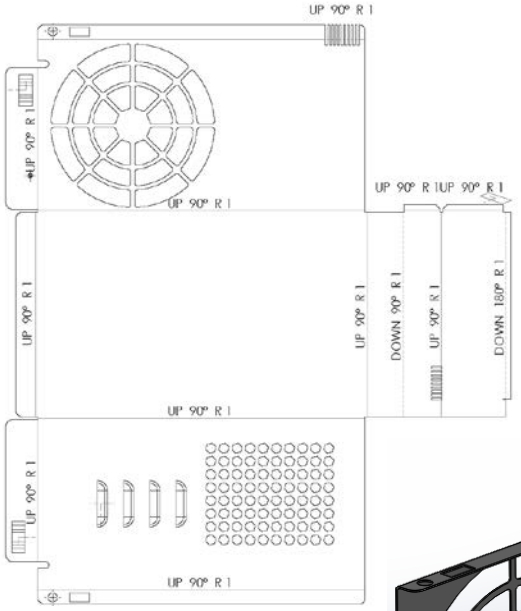


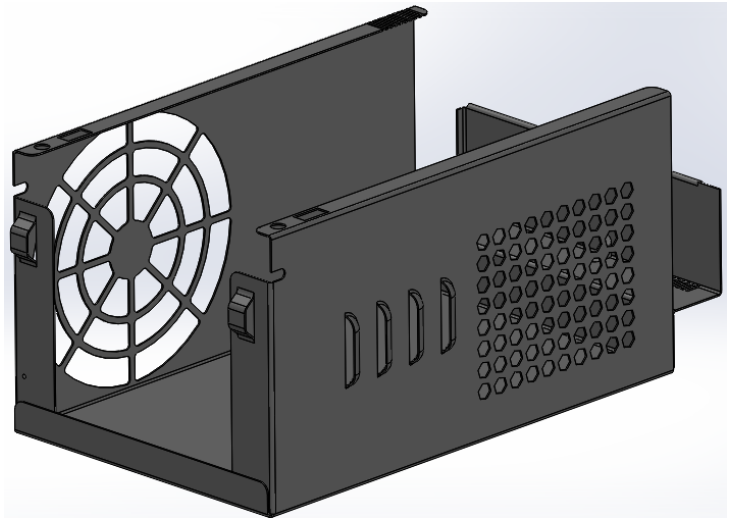
WATCH DIAL

WRENCH

PIPE WRENCH

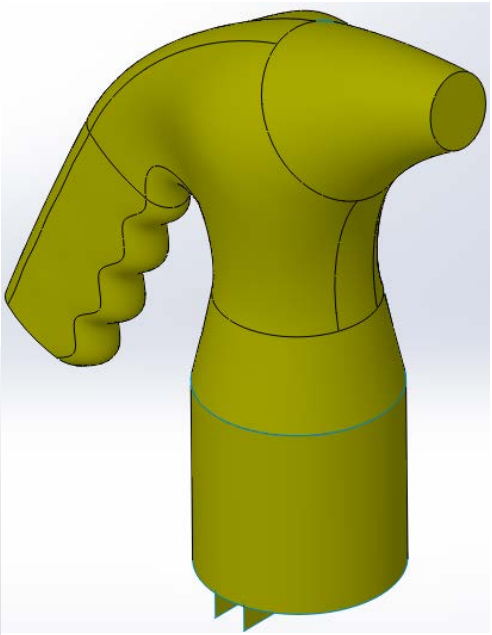
SOME SHEET METALS

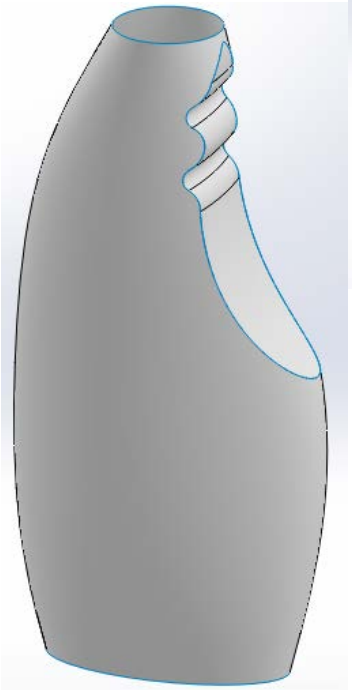




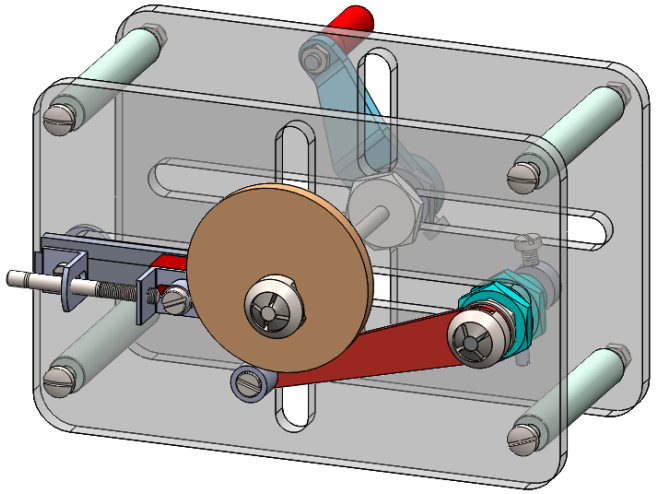
POWER SUPPLY BOX CASE

SOME SURFACE MODELLINGS (just give a try)

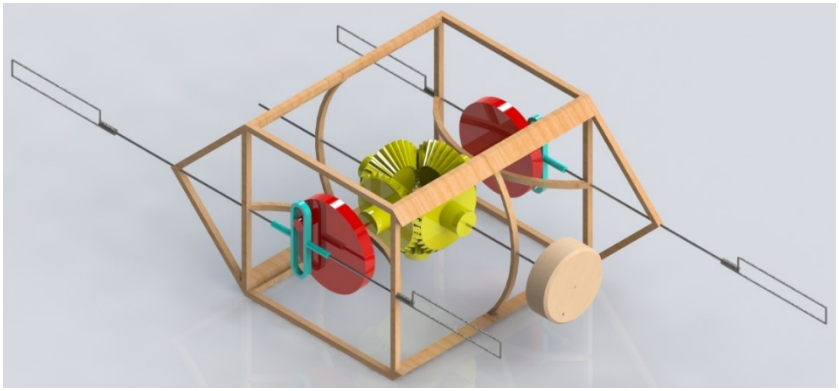




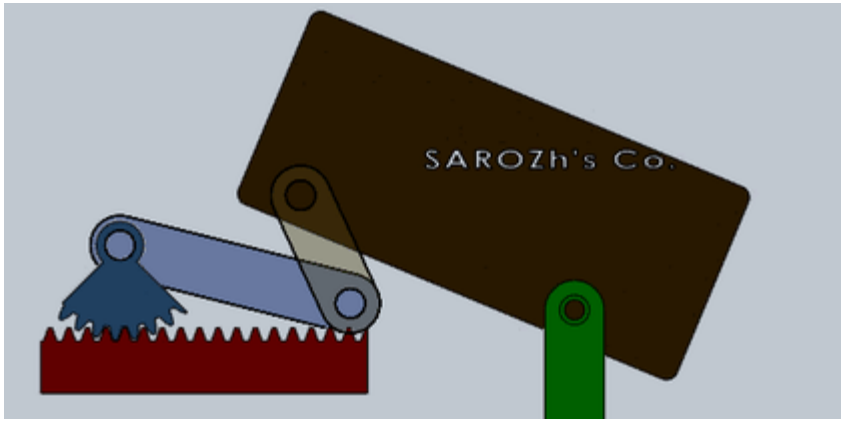
COLLIN CASE



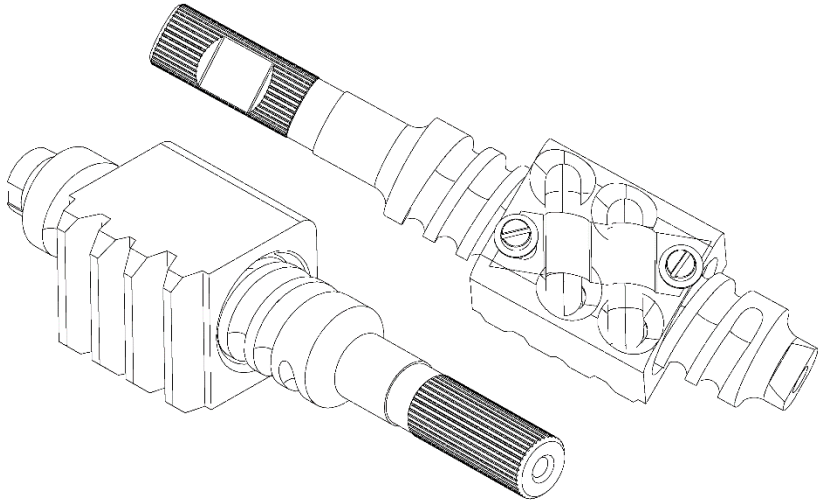
CAM WITH STRAIGHT AND ANGULAR FOLLOWER (STUDY MATERIAL)



MULTIPURPOSE MACHINE (SAW AND GRIND) USING SCOTCH YOKE MECHANISM

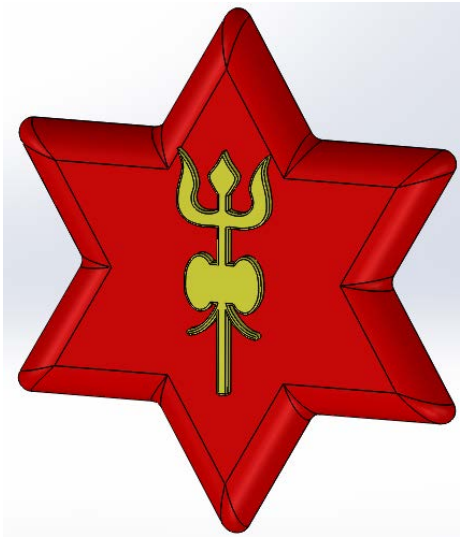


RACK AND PINION WITH LINKAGE FOR UPLIFT MECHANISM (STUDY MATERIAL)



RECIRCULATING SCREW BALL STEERING SYSTEM

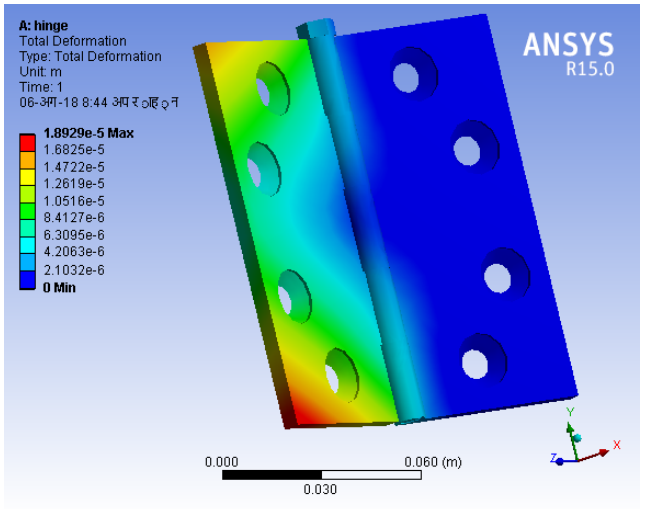
TOGGLE CLAMP



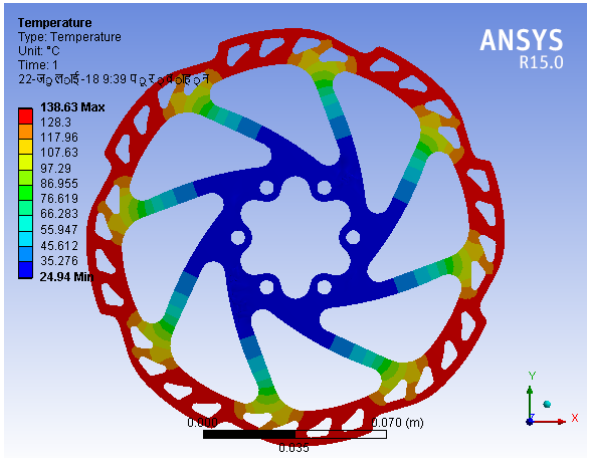
NEPAL ARMY LOGO (FOR BADGE)

UNITED NATION'S LOGO (FOR BADGE)

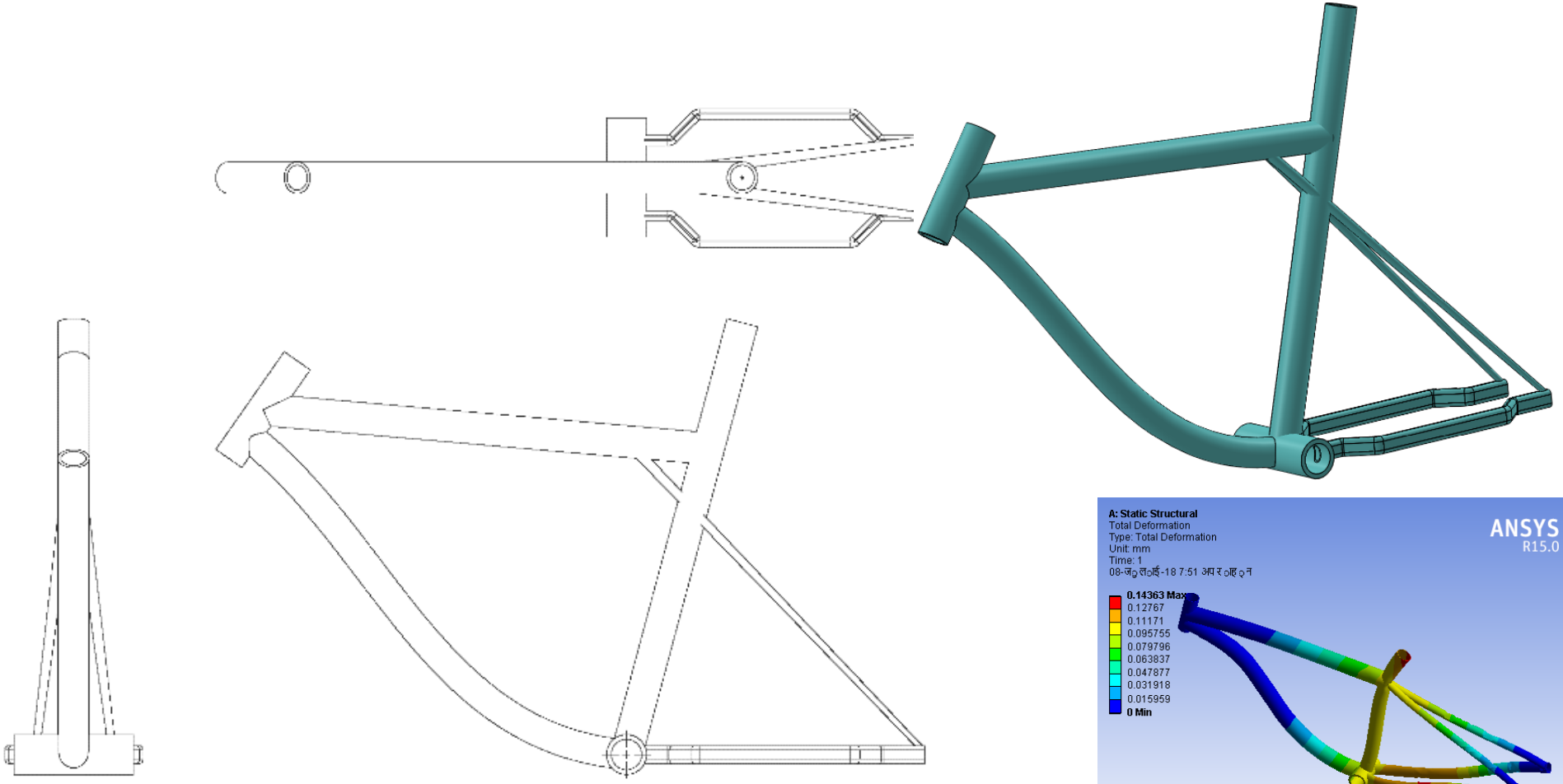
GENERATOR TYRE



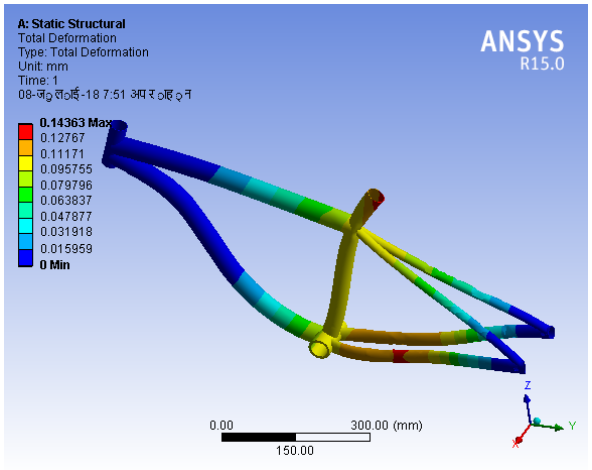
HINGE DEFORMATION ANALYSIS



BIKE DISK BRAKE THERMAL ANALYSIS



BIKE FRAME



BIKE FRAME DEFORMATION ANALYSIS