

FOOT FLANGER MACHINE

Aim: To give flanges on both sides of the reformed can body and measure the power transmission elements of a foot flanger machine.

Apparatus:

1. Reformed can body
2. Outside caliper
3. Measuring cloth tape
4. Thread (Nylon)

Working principle: The machine is foot operated and the power from the electrical motor is transmitted to the reduction gearbox by means of pulleys and 'V' belt. The function of the reduction gearbox is to reduce the speed ratio. The reduced speed actuates the two punches in forward and backward direction with the help of spindle, cam and lever mechanism. Therefore by keeping the reformed can body in between the two punches on the foot flanger bed stand, the required flange can be obtained on both sides of the can body. Depending upon the length of the can body the stroke length of the punches can be adjusted on the foot flanger bed. Nearly 40 to 50 can flanges per minute can be done using the machine.

The machine essentially consists of the following parts.

1. Cast-iron body
2. Electrical motor
3. Reduction gear box
4. Spindle, cam and lever mechanism
5. Pulleys
6. Head stock with assembled punches

Procedure:

- The condition of the machine should be observed and if necessary greasing, oiling and cleaning should be done.
- Keep the reformed can body at the center of the bed on the stand
- Switch on the starting button
- Press the foot pedal once firmly and release
- Take the flanged can body away for the next operation
- Switch off the main switch

Precaution: Hold the reformed can body at the center during flanging and not at the ends of the body.

Observations: Following observations have to be recorded

Sl.No.	Parameters	
1.	Horse power of the motor (HP/KW)	
2.	Speed of the motor(rpm)	
3.	Diameter of the driver pulley(cms)	
4.	Diameter of the driven pulley(cms)	
5.	Center distance between the driver and driven pulleys(cms)	

6.	Speed of the driver (rpm)	
7.	Speed of the driven (rpm)	
8.	Type of gears used in the reduction gearbox	
9.	No. of gear used (No.)	
10.	No. of teeth on each gear (No.)	
11.	Type of belt used	
12.	No. of belts used (No.)	
13.	Type of belt drive system	

Calculations:

1)

N_2

Gear ratio = -----

N_1

T_1

= -----

T_2

Where,

N_1 = Speed of the driver gear in rpm

N_2 = Speed of the driven gear in rpm

T_1 = No of teeth on driver gear

T_2 = No of teeth on driven gear

2) Velocity ratio of belt drive

N_2

= -----

N_1

d_1

= -----

d_2

Where,

N_1 = Speed of the driver in rpm

N_2 = Speed of the driven in rpm

d_1 = Diameter of the driver in cm

d_2 = Diameter of the driven in cm

3) Length of the belt

$(r_1 - r_2)^2$

$L = (r_1 + r_2) + 2x +$ -----

x

Where,

r_1 = radius of the driver pulley in cms

r_2 = radius of the driven pulley in cms

x = distance between the center of the pulley in cms

$$\text{HP} = \frac{2 \pi NT}{4500}$$

4) Diameter of the shaft

$$T = \frac{\pi}{16} f_s d^3$$

Where,

f_s = Shear stress in Kg/cm²

T = Torque in Kg-m

N = rpm

HP = Horse power

d = Diameter of driver shaft in cms