EXPERIMENT NO. 11

Practical Name: Worm and Worm Wheel

INTRODUCTION

Worm and worm wheel consist of a square threaded screw (known as worm) and a toothed wheel (known as worm wheel) geared with each other. A wheel is attached to the worm, over which passes a rope a load is securely mounted on the worm wheel.

FORMULA USED

Let L = Radius of the wheel

r = Radius of the load drum

W = Load lifted

P = Effort applied to lift the load

T = Number of teeth on the worm wheel

If the worm is single threaded (i.e., for one revolution of the wheel, the worm pushes the worm wheel through one tooth) then for one revolution of the wheel the distance moved by the effort = $2\pi L$

The load drum will move through = $1/T$ revolution

Distance, through which the load will move = $2\pi r / T$

V.R = (Distance moved by P) / (Distance moved by W) = $(2\pi L / (2\pi r / T)) = LT / r$

In general, if the worm is n threaded then, $V.R = LT / nr$
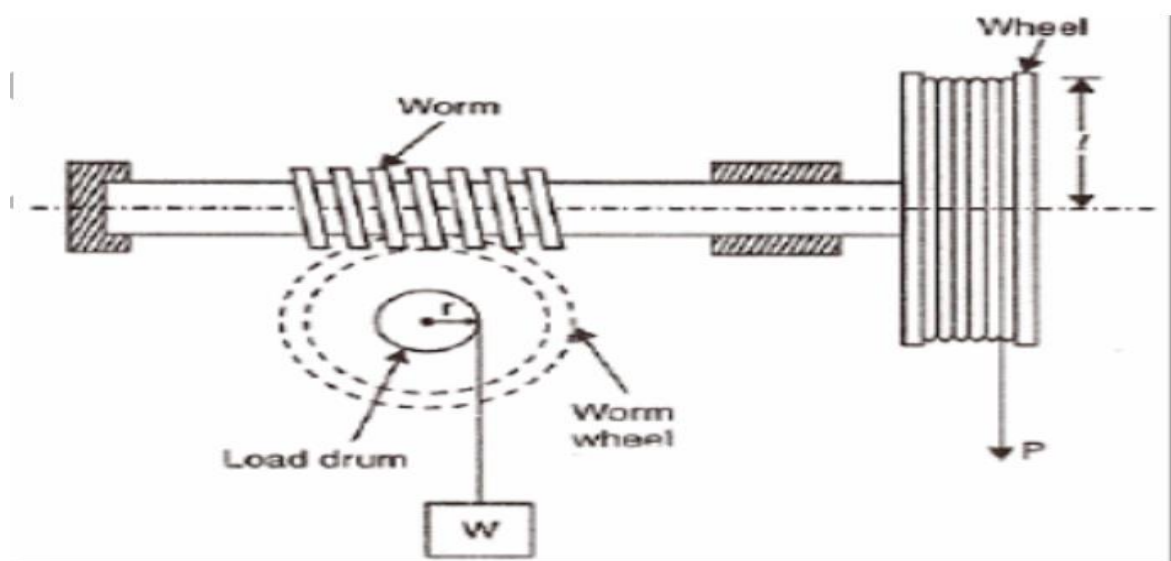
$M.A = W / P$

$\eta = M.A / V.R$

Figure - Worm and worm wheel

PROCEDURE:

1.Firstly stabilize the Single Start Worm and Worm Wheel machine and wrap the cord around the load drum and the effort wheel.

2. Put some weight on the load drum. And add some effort to the effort wheel via hanger.

3. Hit the machine with some material, thus you will see some kind of movement in the load drum as well as in effort wheel.

4. Write down the reading in the observation table

5. After this apply the above procedure, four to five times with gradually increasing the Load as well as Effort to the load drum and effort pulley respectively.

6. Write down the all reading in the given observation table.

7. Measure the radius of the load drum and the radius of the effort wheel.

8. Calculate the MA, VR and η of machine.

SAMPLE DATA SHEET:

Diameter of wheel, D in cm =

Diameter of axle, d in cm =

V.R.   =

Weight of load pan/hanger = a gm =

Weight of effort pan/hanger = b gm =

Sr.No	Load		Effort		M.A=W/P	%ἡ=M.A/V. R*100
	W1 in pan gm	W=w1+ a	W2 in pan gm	W=W2+b		

RESULT:

Mean efficiency of apparatus …………..

PRECAUTIONS:

1. Lubricate the screw before starting the experiment.

2. Trapping should be done after adding the weight in the effort hanger.

3. Overlapping of string should not be there.