



EXPERIMENTAL STUDY AND ANALYSIS OF FLAT BELT CONVEYER SYSTEM WITH DIFFERENT R.P.M.



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ABSTRACT

In this paper, we are study about flat belt conveyer system with different R.P.M. such as 50,100,150,200,250 and 300 R.P.M. In this study, it is also included that the observations the different load carrying capacity (Grams) at different working time (Hours). The flat belt conveyer system is very important for the purpose of the material handling system from one place to other place, which is directly depended on the effective length of belt as 1800 mm. In this system we are used the D.C. motor drive system for the purpose of the loading and unloading condition of metallic hook , which is attached the lower portion of flat belt.

1. INTRODUCTION

The flat belt conveyer system is very useful for material handling system because of it has different speed of Gear head D.C. motor such as 50,100,150,200,250 and 300 R.P.M. The thickness of flat belt has 3.26 mm, width of flat belt has 120.66mm and total length of flat belt has 4100.85mm. The conveyer system is also very important when two units of industries has constructed in different place, in this way material handling drive system is very necessary for the proper working condition of plants.



Figure 1: Flat belt conveyer system

2. EXPERIMENT PROCEDURES

The Gear head Motor, Power supply, Cylindrical Type Roller, Ball bearing (6204ZZ, 6 Piece) and Frame is used the construction of working model and the specification of components are shown in Table.1. In flat belt conveyor system, it is very useful for material handling system one place to other place because of it has different type speed of motor such as 50,100,150,200,250 and 300 R.P.M. with the different load carrying capacity in grams at different working time as 1 to 7 Hours. In this way, First of all load is attached on the hook and D.C. motor has ON condition, when the total working length of flat belt is achieved such as 1800 mm then motor has OFF condition using of liver based switch during one direction speed of D.C. motor.



Figure 2: Ball Bearing (6204ZZ)



Figure 3: Flat belt



Figure 4: Flat Roller

Table 1: Specification of components

Sr. No.	Components	Specification
1	Gear head Motor	12V.D.C., 10Kgf Torque
2	Direction of Motor	Both side with Polarity
3	Power supply	12V.D.C., Transformer and Rectifier based with 3 Amp.
4	Roller	Cylindrical Type
5	Ball Bearing	6204ZZ, 6 Piece
6	Effective length of belt	1800 mm
7	Connection wire	3 mm
8	Frame	Metallic Type

3. RESULTS AND DISCUSSION

Table 2: Gear head D.C. Motor with 50 R.P.M.

Observation No.	Time (Hours)	Load carrying capacity(Grams)
1	1	500
2	2	1000
3	3	1500
4	4	2000
5	5	2500
6	6	3000
7	7	3500

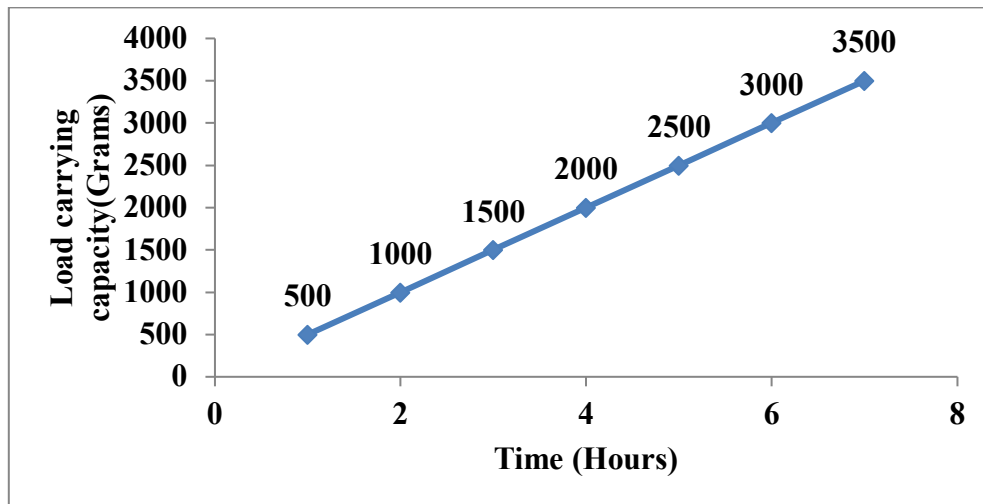


Figure 5: Gear head D.C. Motor with 50 R.P.M.

Table 3: Gear head D.C. Motor with 100 R.P.M.

Observation No.	Time (Hours)	Load carrying capacity(Grams)
1	1	1000
2	2	1500
3	3	2000
4	4	2500
5	5	3000
6	6	3500
7	7	4000

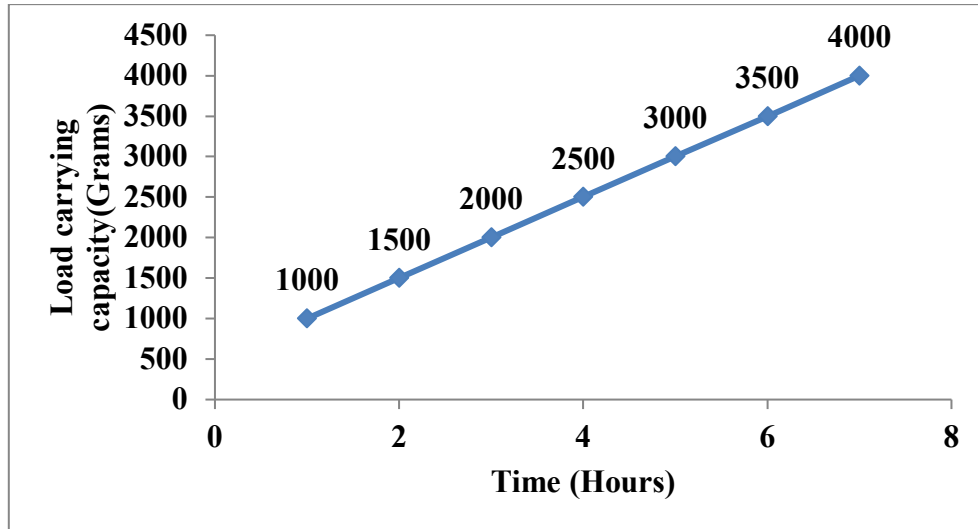


Figure 6: Gear head D.C. Motor with 100 R.P.M.

Table 4: Gear head D.C. Motor with 150 R.P.M.

Observation No.	Time (Hours)	Load carrying capacity (Grams)
1	1	1500
2	2	2000
3	3	2500
4	4	3000
5	5	3500
6	6	4000
7	7	4500

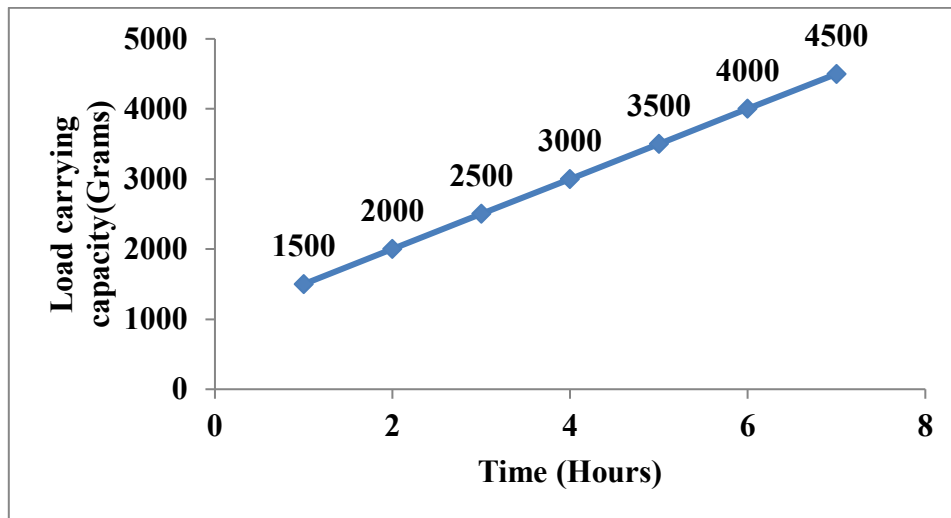


Figure 7: Gear head D.C. Motor with 150 R.P.M.

Table 5: Gear head D.C. Motor with 200 R.P.M.

Observation No.	Time (Hours)	Load carrying capacity (Grams)
1	1	2000
2	2	2500
3	3	3000
4	4	3500
5	5	4000

6	6	4500
7	7	5500

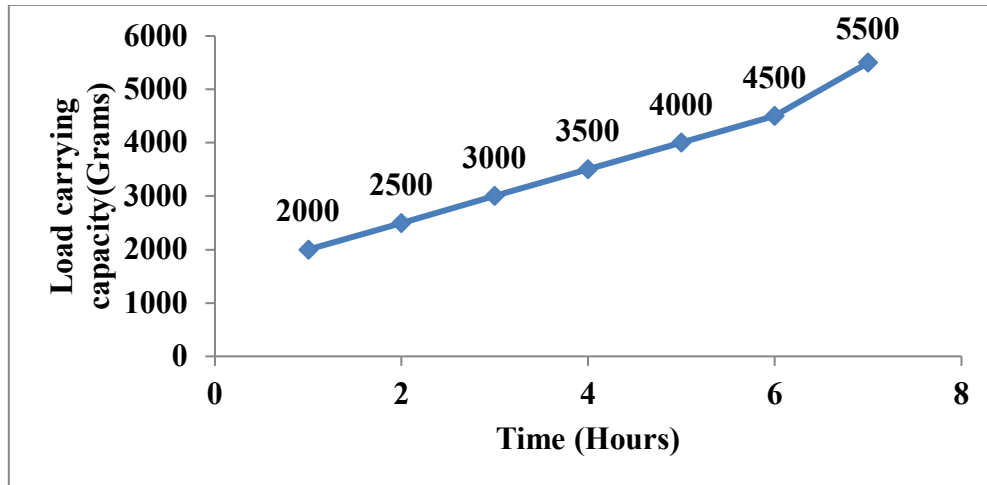


Figure 8: Gear head D.C. Motor with 200 R.P.M.

Table 6: Gear head D.C. Motor with 250 R.P.M.

Observation No.	Time (Hours)	Load carrying capacity (Grams)
1	1	2500
2	2	3000
3	3	3500
4	4	4000
5	5	4500
6	6	5500
7	7	6600

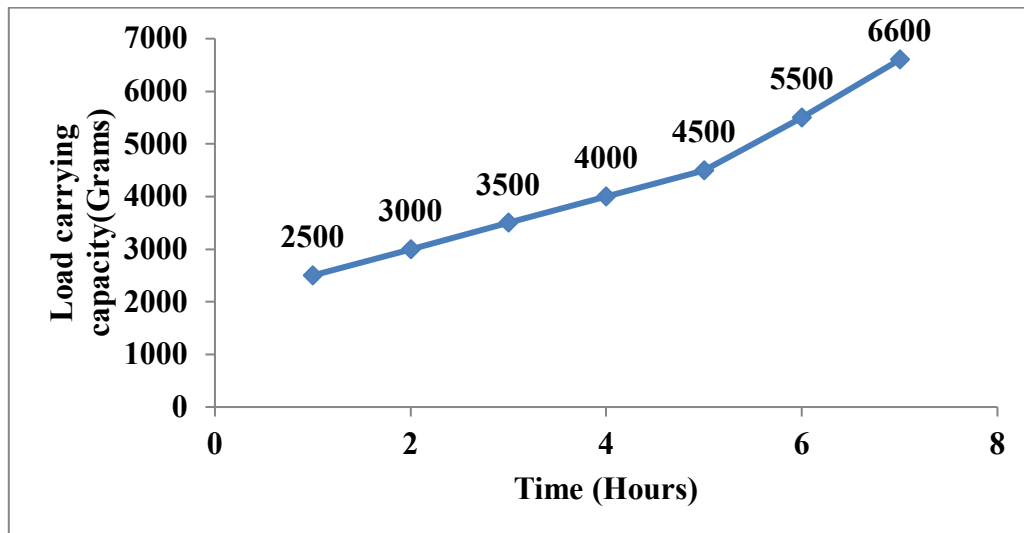


Figure 9: Gear head D.C. Motor with 250 R.P.M.

Table 7: Gear head D.C. Motor with 300 R.P.M.

Observation No.	Time (Hours)	Load carrying capacity (Grams)
1	1	3500
2	2	4000
3	3	4500

4	4	5500
5	5	6600
6	6	6600
7	7	6600

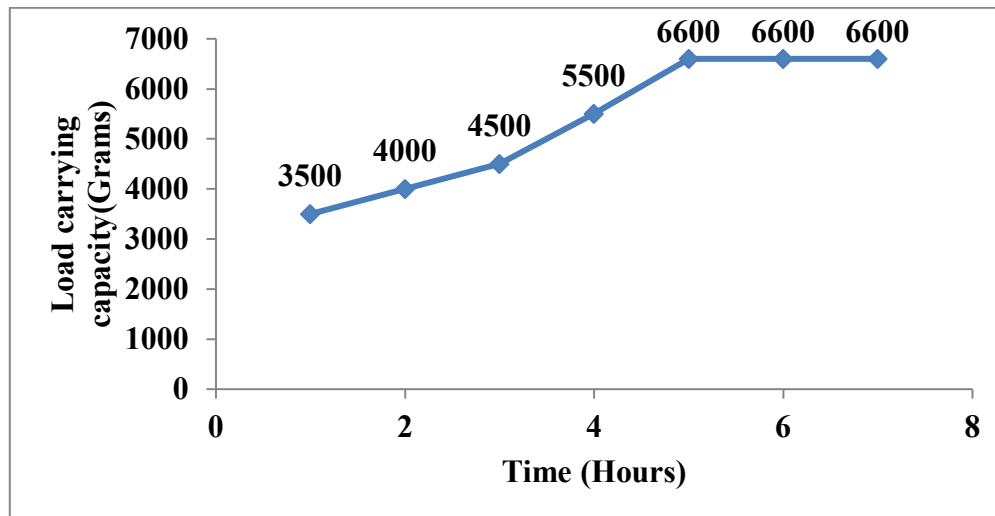


Figure 10: Gear head D.C. Motor with 300 R.P.M.

4. CONCLUSION

In this study, we are observed that different load carrying capacity in grams from 500 to 6600 grams at different working time in Hours with different R.P.M. such as 50,100,150,200,250 and 300 R.P.M using 12 V. D.C. motor, which has 10Kgf Torque for proper working condition of flat belt conveyer system. It is found that 6600 grams load which attaches the lower portion of flat belt has constant at the time from 5 to 7 hours of proper working of drive system during speed of Gear head D.C. Motor has 300 R.P.M, which is shown in Table.7.

SOURCES OF FUNDING

None.

CONFLICT OF INTEREST

None.

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