"DESIGN OF FLEXIBLE SPRING CONVEYOR"

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ABSTRACT

We are doing Of modification in available screw conveyor machine and increase the production. We added the flexible spring and modify the design for reduce the cost. We can call it flexible spring conveyor. After the modification we got high efficiency cost. machine and low Flexible spring conveyor is one type of atomization used to material transfer from one place to another place. We can use it in different field in industry or agriculture.

Keyword: - material, hopper, flexible screw.

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1. Introduction

A conveyor system is a common piece of mechanical handling equipment that moves materials from one location to another. Conveyors are especially useful in applications involving the transportation of heavy or bulky materials. Conveyor systems allow quick and efficient transportation for a wide variety of materials, which make them very popular in the material handling and packaging industries. Many kinds of conveying systems are available, and are used according to the various needs of different industries. Conveyor systems are used widespread across a range of industries due to the numerous benefits they provide Conveyors are able to safely transport materials from one level to another, which when done by human labor would be strenuous and expensive.

They can be installed almost anywhere, and are much safer than using a forklift or other machine to move materials. They can move loads of all shapes, sizes and weights. Also, many have advanced safety features that help prevent accidents. There are a variety of options available for running conveying systems, including the hydraulic, mechanical and fully automated systems, which are equipped to fit individual needs.

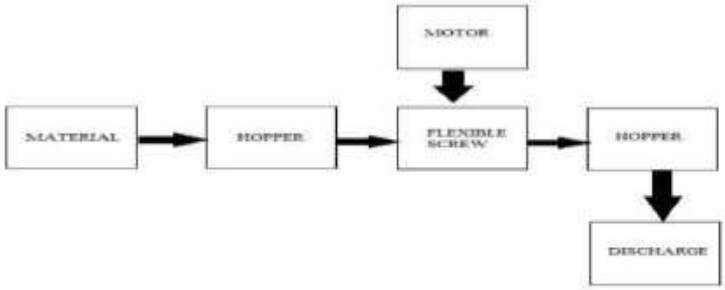
Conveyor systems are commonly used in many industries, including the automotive, agricultural, computer, electronic, food processing, aerospace, pharmaceutical, chemical, bottling and canning, print finishing and packaging. Although a wide variety of materials can be conveyed, some of the most common include food items such as beans and nuts, bottles and cans, automotive components, scrap metal, pills and powders, wood and furniture and grain and animal feed.

Many factors are important in the accurate selection of a conveyor system. It is important to know how the conveyor system will be used beforehand. Some individual areas that are helpful to consider are the required conveyor operations, such as transportation, accumulation and sorting, the material sizes, weights and shapes and where the loading and pickup points need to be

1.1 BASIC PRINCIPALE

The flexible spring conveyor is working on same principle of screw conveyor but the main difference is flexible screw conveyors are shaft less and flexible. A flexible screw conveyor, also known as a spiral conveyor, screw conveyor, helix conveyoror centre less auger conveyor. Flexible screw that is enclosed in a flexible or rigid plastic tubeand driven by an electric motor normally located at the discharge end of the conveyor. Thissimple design delivers efficient performance and high reliability while reducing maintenanceand cost.

When properly engineered according to the specific characteristics of the materialbeing conveyed and the process into which it will be integrated, a flexible screw conveyor can outperform rigid screw conveyors, bucket elevators, drag chain conveyors, aeromechanical conveyors and other equipment intended to transport powder and bulk solidmaterials.



2.ANALYSIS AND RESULT

2.1 AT INTERNAL PIPE DIAMETER 34 MM

SR. NO.	MATERIAL TYPE	MASS OF MATERIAL(KG)	MOTOR SPEED(R.P.M)	TIME(SEC)
1	WHEAT FLOUR	4	150	100
2	WHEAT	4	150	160
3	PEARL MILLET	4	150	170

2.2 INTERNAL PIPE DIAMETER 42 MM

SR.NO.	MATERIAL TYPE	MASS OF MATERIAL(KG)	MOTOR SPEED(R.P.M)	TIME(SEC)
1	WHEAT FLOUR	4	150	50
2	WHEAT	4	150	80
3	PEARL MILLET	4	150	105

3. DESIGN CALCULATION

Assumptions:-

Maximum load capacity = 100

Design load = 50 N

Maximum deflection = 40 mm

Mean diameter = 30mm

Spring wire diameter = 5mm

Calculations:

(Design Of Spring)

Mean Diameter Of Spring Coil

Let,

D = Mean diameter of spring coil

d = diameter of spring wire

C = spring index

now, C = D/d

= 30/5
= 6

Therefore, spring index is 6.

Now, maximum shear stress ɾ= k*8wc/πd^2

Where, k=Wahl's stress concentration factor

= = (4c-1/4c-4) + (0.615/c)
= (4*6-1/4*6-4) + (O.615/6)
= 1.2525

2dπ/cw8*k =ɾ

= (1.2525*8*50*6)/ (π*5^2)
= 38.273 N/mm^2

Therefore, maximum shear stress is 38.273 N/mm^2.

Outer dia. Of spring coil (Do) =D+d=30+5

=35 mm

No. Of Turns Of Coil

Now maximum deflection of spring (δ) =8*w*c^3*n/G*d

Where G = modulus of rigidity of spring =84*10^3 N/mm2 40 = (8*50*6^3*n/84*10^3*5)

n =194.44

≈194

For open ended coil, n' = n+2 = 194+2 = 196

Free Length Of Spring

L=n'd+ δ+0.15 δ

=196*5+40+0.15*40

=1026 mm

≈1035 m

pitch of coil

P = L/n'-1
= 1035/ (196-1) =5.30mm

4. CONCLUSIONS:-

The final conclusion is that by changing internal diameter of pipe and motor speed we can get the discharge of material more and constantly in short time And also it decreases cost of production. Flexible Spring Conveyor system can be a good substitute to manual material handling in small scale industries.

5. ACKNOLEDGEMENT

On the very outset of this report, I would like to extend my sincere and heartfelt obligation towards all the personages who have helped me in this endeavor. Without their active guidance, help, corporation and encouragement, I would not have made head way in the project.

First and foremost, I would like to express my sincere gratitude to my project guide , **Asst.prof. Sunil J Patel .**It has been a great pleasure for me to get an opportunity to work under him and complete the present work successfully.

We wish to extend my sincere thanks to **Asst.prof. Sanket T Gandhi**, Head of our Department, for approving our project work with great interest.

6. REFERENCES

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