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Design and Fabrication of Pneumatic Vibrator

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Abstract - *From storage tanks to material producing processes in automatic factory. They require different piping, horozoutal, conveyor, weighing, arrangement, separate, coding, life testing equipment dust, collecting, and main in process automation. Material characteristic (moisture, s.g., size…) and equipment design (shape, stuff…) usually lead to accumulated or even decreasing material delivery flow problems in working flows. Pneumatic vibrator provides the best solution by applied it onto problem position. By using pneumatic vibrator to shake or peel off clog material from applied object or to low down friction between materials to make it move smoothly in automatic production..*

Key Words: **Pneumatic, Vibrator, Analysis, Properties, Design etc…**

1. INTRODUCTION

The pneumatic vibrator is a versatile piece of equipment that is essential to many industries. In construction for example, the pneumatic vibrator is used to remove excess moisture and pockets of air from freshly poured concrete ensuring that the end result is uniform, attractive and above all, safe. In agricultural settings these easy to use vibrators are responsible for emptying silos, among other things, while in pharmaceuticals a pneumatic vibrator can separate fine powders or be used as a feeding mechanism. Not only does a pneumatic vibrator save time and money it can also make tasks safer and easier. A vibrator is a mechanical device to generate vibrations. The vibration is often generated by an electric motor with an unbalanced mass on its driveshaft.

1.1 WORKING PRINCIPLE:

It is simple structured small size vibrator with strong vibrating force. The vibrator is responsive for sudden activation deactivation which eliminates the damage of the equipments to the minimum level. The vibrator is forced by compressed air easily operated without spark. The working principle does not cause sparks which can be applied in hazardous humid or other severe environment. Power force, frequency and amplitude can be adjusted while operating. The compressed air is used for pneumatic vibrator. This compressed air is passed through the nozzle and then they hit on the surface of rotar blade. The blade and unbalanced mass mounted on shaft can rotate at high speed to produce vibration.

1.2 MERIT OF VIBRATORS:-

Pneumatic vibrator force power, frequency, amplitude, are not only easily changed but also can be adjusted while operating. Ideally on vibration test. The body is made of highly strength aluminum alloy. It is a well simple structure and small size with strong vibrating force. The damage to equipment will be minimized while suddenly power on/off. Moving by Air, easy operate no spark. They can be applied onto hazardous area or high humidity work environment Different vibration frequency types can meet with various requirement.

2. Material Used for Fabrication of Pneumatic Vibrator:-

Mild steel is used for fabrication. Mild steel (iron containing a small percentage of carbon, strong and tough but not readily tempered), also known as plain-carbon steel and low-carbon steel, is now the most common form of steel because its price is relatively low while it provides material properties that are acceptable for many applications. Mild steel contains approximately 0.05–0.25% carbon making it malleable and ductile. Mild steel has a relatively low tensile strength, but it is cheap and easy to form; surface hardness can be increased through carburizing.

Table -1: Chemical Composition

Element	Contents
Carbon, C	0.14 - 0.20 %
Iron, Fe	98.81 - 99.26 % (as remainder)
Manganese, Mn	0.60 - 0.90 %
Phosphorous, P	≤ 0.040 %
Sulfur, S	≤ 0.050 %

Low-carbon steels suffer from yield-pointrunout where the material has two yield points. The first yield point (or upper yield point) is higher than the second and the yield drops dramatically after the upper yield point. If a low-carbon steel is only stressed to some point between the upper and lower yield point then the surface develops Lüder bands. Low-

carbon steels contain less carbon than other steels and are easier to cold-form, making them easier to handle.

A waveform is a graphical representation of how the vibration level changes with time. The information contained in the waveform depends on the duration and resolution of the waveform. The total time period over which the information is obtained from the wave form is called the duration. The level of detail is defined as resolution or the number of samples present in the waveform.

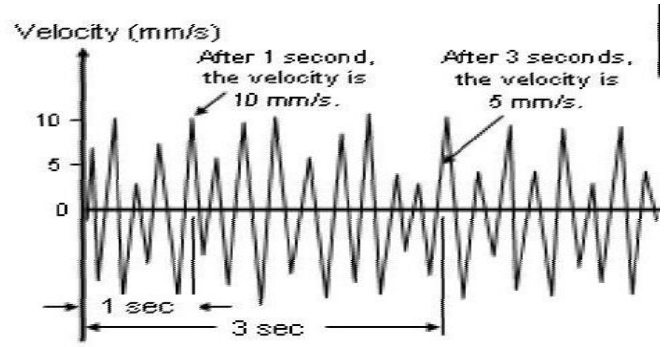

Chart -1: Waveform

Solidwork Software is used for create 3D model of Pneumatic Vibrator. SolidWorks is a solid modeling computer-aided design and computer-aided engineering computer program that runs on Microsoft Windows. SolidWorks is published by Dassault Systèmes.

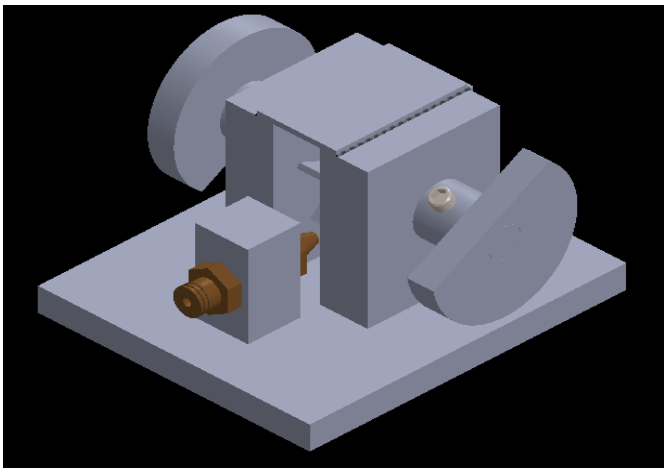

Fig -1: 3D model of Pneumatic Vibrator

Building a model in SolidWorks usually starts with a 2D sketch (although 3D sketches are available for power users). The sketch consists of geometry such as points, lines, arcs, conics (except the hyperbola), and splines. Dimensions are added to the sketch to define the size and location of the geometry. Relations are used to define attributes such as tangency, parallelism, perpendicularity, and concentricity. The parametric nature of SolidWorks means that the dimensions and relations drive the geometry, not the other way around. The dimensions in the sketch can be controlled independently, or by relationships to other parameters inside or outside of the sketch.

3. CONCLUSION

Not only does a pneumatic vibrator save time and money it can also make tasks safer and easier. Simple production process. Low manufacturing costs. Improve production quality. It can maximize process efficiency. Electricity consumption.

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