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Review On Development Of Wire Brush Making Machine

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Abstract

This project introduces a brush-making machine that operates on the principle of wire twisting, transforming a single wire into two. The machine's operation is straightforward, allowing for the production of round brushes in various sizes and shapes. By manually rotating a shaft, the wire undergoes twisting, incorporating nylon material seamlessly into the process. The workflow involves simple steps, including stretching and cutting the wire, as well as fixing it securely in place for twisting. With an estimated production rate of 95 to 110 brushes within an 8-hour workday, this machine offers an efficient solution for small-scale brush manufacturing endeavors. Its accessibility and ease of use make it an attractive option for entrepreneurs seeking to enter the brush-making industry, enabling them to set up operations affordably and efficiently while meeting the demand for quality brushes in the market.

Keywords: Orpiment Stretching, Aligns, Thriving, Shaft, Iterative Shells, Brush

1.Introduction

Human beings in creating solutions that enhance their quality of life. Indeed, leveraging logical thinking and innovation, humans have developed various technologies to make their lives easier and more comfortable.

The concept of designing and manufacturing a brush-making machine aligns with the human tendency to streamline tasks and achieve goals with minimal effort. Such a machine would be valuable, especially considering the widespread use of brushes in daily life, particularly for domestic purposes like cleaning cans, boilers, and other household items. Additionally, in industries such as small boiler plants, where the removal of slag or deposition of shells is necessary, these brushes would prove highly useful.

In India, where there is a significant presence of small-scale industries, the affordability and simplicity of the brush-making machine make it a viable option for entrepreneurs looking to start their ventures. The low initial cost of setting up such a plant, coupled with the availability of raw materials like wire and threads, further enhances its feasibility for aspiring entrepreneurs.

In essence, the design and manufacturing of a brush-making machine not only cater to the practical needs of individuals and industries but also offer opportunities for economic empowerment and entrepreneurship, particularly in regions with a thriving small-scale industry sector like India.

2. Objective of the project

i. Develop a brush-making machine based on wire twisting principle.
ii. Enable production of round brushes in different sizes and shapes.
iii. Simplify operation for small-scale brush manufacturing.
iv. Ensure cost-effectiveness and efficiency in production.
v. Facilitate entry of entrepreneurs into the brush-making industry

Scope of Project

i. To understand the basic principal of the our project
ii. Describe the construction and working of various parts of our project
iii. Development of the working model of the our project
iv. To reduce time spent on this activity.

3.Literature Review

A brush is a common tool with bristles, wire or other filaments. It generally consists of a handle or block to which filaments are affixed in either a parallel or perpendicular orientation, depending on the way the brush is to be gripped during use. The material of both the block and bristles or filaments is chosen to withstand hazards of its intended use, such as corrosive chemicals, heat or abrasion. It is used for cleaning, grooming hair, make up, painting, surface finishing and for many other purposes. It is one of the most basic and versatile tools in use today, and the average household may contain several dozen varieties. A common way of setting the bristles, brush filaments, in the brush is the staple or anchor set brush in which the filament is forced with a staple by the middle into a hole with a special driver and held there by the pressure against all of the walls of the hole and the portions of the staple nailed to the bottom of the hole. The staple can be replaced with a kind of anchor, which is a piece of rectangular profile wire that is anchored to the wall of the hole, like in most toothbrushes. Another way to attach the bristles to the surface can be found in a fused brush, in which instead of being inserted into a hole, a plastic fibre is welded to another plastic surface, giving the option to use different diameters of bristles in the same brush. Brushes used for cleaning come in various sizes, ranging from that of a toothbrush, to the standard household version accompanied by a dustpan, to 36" deck brushes. There are brushes for cleaning tiny cracks and crevices and brushes for cleaning enormous warehouse floors. Brushes perform a multitude of cleaning tasks. For example, brushes lightly dust the tiniest figurine, they help scrub stains out of clothing and shoes, they remove grime from tires, and they remove the dirt and debris found on floors with the help of a dust pan. Specific brushes are used for diverse activities from cleaning vegetables, as a toilet brush, washing glass, cleaning tiles, and as a mild abrasive for sanding. In general favourite clothes are, no doubt of value and almost certainly not items of clothing you want to wash frequently. A run of color or loss of shape are all perils of the washing machine and dry cleaner. So to maintain a dirt, dust and hair free wardrobe, a lint roller or a washing machine won't effectively remove anything more than superficial fluff. The optimal solution is to invest in a good quality clothes brush, to remove deep rooted dust, dirt and debris. A 100% wool suit, for instance, takes much more care to maintain than a poor-quality, synthetic version. But it's worth it. You should really brush the former after each time of wearing – it only takes a couple of minutes. We all know that washing a finely tailored wool suit is a no go but as alluded to earlier, avoid dry-cleaning too. The chemical process is proven to weaken fabric. You lose the bounce and the finish – they become shiny, flat and lifeless. Instead, try a gentle steam in the bathroom for a freshen up or air by a window then brush it plump up the fibers and restore the fabric's luster. Use dry cleaning as a last resort, and a good one at that often made with boar or horse hair, natural bristle clothes brushes are the best you can buy. Cheaper alternatives are often made of synthetic nylon and have less 'give', resulting in a harsher scrubbing or scratching of delicate fabrics. A natural bristle offers better longevity too, potentially lasting a lifetime whereas a synthetic bristle will wear out quicker. For exceptionally soft, finely woven or velvet clothing you might wish to use a velvet-faced lint brush. Even

gentler than a natural bristle, a velvet-faced lint brush will pick up fluff, hair and other clinging particles. The better clothes brushes have bristles fitted into a handle. Good quality materials will last a lifetime,

4.Methodology of Working of Project

Parts used in the project

- Shaft
- Bearing
- Frame structure
- Handle

Diagram of the project

Working of the project:

The operation of the brush-making machine begins with the preparation of materials, namely wire and nylon. The wire is carefully cut into suitable lengths, while the nylon material is appropriately prepared. Subsequently, the machine is configured for operation, with the wire securely affixed onto a shaft or chuck. One end of the wire is tightly fastened using a nut, while the other end is prepared for the twisting process.

Manual rotation of the machine's shaft or handle is then initiated by the operator. This rotational movement induces a twisting motion to the wire, effectively incorporating the nylon material between the twisted strands to create the brush's bristles. This twisting action continues until the entire length of wire is adequately twisted, typically reaching a designated tie plate or fixture.

Design consideration of the project

Project design may be defined as the iterative decision making activity to create a plan or plans by which the available resources are converted, preferably optimally, into systems, processes or devices to perform the desired functions and to meet human needs.In fact project design has been defined in many ways but the simplest ways to define project design as

"An iterative decision making process to conceive and implement optimum systems to solve society's problems and needs."

Project design is practical in nature and must be concerned with physical reliability, or economic and financial feasibility Design is essentially a decision-making process. If we have a problem, we need to design a solution. In other words, to design is to formulate a plan to satisfy a particular need and to create something with a physical reality.

Basic concept of project design:

Decision making comes in every stage of design. Consider two cars of different makes. They may both be reasonable cars and serve the same purpose but the designs are different. The designers consider different factors and come to certain conclusions leading to an optimum design. Market survey gives an indication of what people want. Existing norms play an important role. Once a critical decision is made, the rest of the design features follow. For example,once we decide the engine capacity, the shape and size, then the subsequent course of the design would follow. A bad decision leads to a bad design and a bad product.

Design may be for different products and with the present specialization and knowledge bank, we have a long list of design disciplines e.g. ship design, building design, process design, bridge design, clothing or fashion design and so

Types of project design:

There may be several types of design such as

1. Adaptive design

This is based on existing design, for example, standard products or systems adopted for a new application. Conveyor belts, control system of projects and mechanisms or haulage systems are some of the examples where existing design systems are adapted for a particular use.

2. Developmental designs

Here we start with an existing design but finally a modified design is obtained. A new model of a car is a typical example of a developmental design.

3. New design

This type of design is an entirely new one but based on existing scientific principles. No scientific invention is involved but requires creative thinking to solve a problem. Examples of this type of design may include designing a small vehicle for transportation of men and material on board a ship or in a desert. Some

research activity may be necessary.

4. Rational design:

This is based on determining the stresses and strains of components and thereby deciding their dimensions.

5. Empirical design:

This is based on empirical formulae which in turn are based on experience and experiments. For example, when we tighten a nut on a bolt the force exerted or the stresses induced cannot be determined exactly but experience shows that the tightening force may be given by P=284d where, d is the bolt diameter in mm and P is the applied force in kg. There is no mathematical backing of this equation but it is based on observations and experience.

6. Industrial design:

These are based on industrial considerations and norms viz. market survey, external look, production facilities, low cost, use of existing standard products.

Advantages of the project

i. No conventional grid electricity required
ii. Long operating life
iii. Highly reliable and durable
iv. Easy to operate and maintain
v. Eco-friendly

Disadvantages of the project

i. High installation cost

Application of the project

Our projectshould use for following various applications like as:

- Making Brush

Conclusion

In conclusion, the development of the brush-making machine based on the wire twisting principle offers a promising solution for small-scale brush manufacturing. By streamlining the production process and enabling the creation of various brush sizes and shapes, this innovation presents significant opportunities for entrepreneurs looking to enter the industry. With its simplicity, cost-effectiveness, and efficiency, the machine addresses the demand for quality brushes in the market while providing a viable avenue for economic empowerment and growth in the manufacturing sector. Overall, this project underscores the power of innovation in meeting practical needs and fostering entrepreneurship in local industries.

Future scope

The project has covered almost all the requirements. Further requirements and improvements can easily be done since the as per requirements is mainly structured or modular in nature. Improvements can be appended by changing the existing modules

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