

Application of second-order conductors through the design and manufacture of a welding machine made with recycled materials

Aplicación de los conductores de segundo orden a través del diseño y fabricación de una Máquina soldadora realizada con materiales reciclados

DIAZ, Eyran†, ORTEGA, Edgar, SILVA, José and MONTIEL, Gloria

Universidad Veracruzana, School of Accounting and Administration, Mexico.

ID 1st Author: *Eyran, Diaz*

ID 1st Co-author: *Edgar, Ortega*

ID 2nd Co-author: *José, Silva*

ID 3rd Co-author: *Gloria, Montiel*

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Abstract

As part of the terms of methods and work systems we undertook a project the teacher showed us it had to be with recycled materials and we like welding Our idea provides a great reliable initial operation, insurance sustainable and economically "a welding machine home" which is easy to transport and simple assembly process that handles an almost similar amperage between 90 and 105 amperes. Which is sufficient for domestic work and a workshop in proportion, speaking of size, productivity thereof. And it cost about 300 pesos. Type of study. Documentary research as an essential part of a process of scientific research, can be defined as a strategy that is observed and systematically reflects on theoretical and empirical realities using for these different types of documents where it explores, interprets,

Resumen

Como parte de los términos de los métodos y sistemas de trabajo que llevamos a cabo un proyecto que el profesor nos mostró que tenía que ser con materiales reciclados y nos gusta la soldadura Nuestra idea proporciona una gran operación inicial fiable, seguro sostenible y económicamente "una máquina de soldadura casa" que es fácil de transportar y el proceso de montaje simple que maneja un amperaje casi similar entre 90 y 105 amperios. Lo cual es suficiente para el trabajo doméstico y un taller en proporción, hablando de tamaño, a la productividad de este. Y cuesta alrededor de 300 pesos. Tipo de estudio. La investigación documental como parte esencial de un proceso de investigación científica, se puede definir como una estrategia que se observa y reflexiona sistemáticamente sobre realidades teóricas y empíricas utilizando para ello diferentes tipos de documentos donde se explora, interpreta,

Innovation, Electric welding, Recycled materials

Innovación, Soldadura eléctrica, Materiales reciclados

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† Researcher contributing first author.

Introduction

Read in the book a real and practical solution that can generate income and we wonder how? taking what already exists and reinventing it in such a way that it is economical and at the same time functional and that better be profitable

A seated example of this is, taking as such a house, the protections, doors, garage railings, etc., for the comfortable and safe stay of the individual or a family in said house, (an example that is too simple but at the same time concise of what we propose). Now the expansion and growth plans of construction companies such as Geo houses.

Ruba among many others, is to provide houses for almost any pockets of the hand of bank credits or infonavit and others, therefore the security in said houses as mentioned above remains on the part of the new owner of the property.

It is there, where our proposal enters. A person who has knowledge of welding and wishes to take advantage of the field left open by the construction of the aforementioned properties will obviously need the appropriate equipment, which we know in advance is not cheap, welding machines that exist in the market of brands like Lincoln, Miller, infra, among others, it ranges between 10,000 and 15,000 pesos, and it is not easy to obtain financing these days with just a good idea. Our idea provides a great reliable, safe, sustainable and cheap initial operation, "a homemade welding machine" which is easy to transport and has a simple assembly procedure that handles an almost similar amperage between 90 and 105 amps. Which is enough for domestic work and a workshop in proportion, speaking of size,

Within the topic of entrepreneurship, a sector that has been showing strong growth is that of businesses started and operated by women. It has been shown that this type of entrepreneurship has a significant impact on the economic development of countries, in reducing poverty and in generating employment (Brush and Cooper, 2012).

General objective. Create an ecological awareness about the importance of recycling materials and supported by innovation, give them a practical use that generates a source of income.

Specific objectives: 1. With the use of plastic materials and cables, design and manufacture a portable, homemade welding machine, designed for light welding work.

Identification of the problem

It is necessary that we promote the reuse of materials to help reduce pollution, which increasingly causes greater health risks, recycling materials and giving them an alternative use for what they were designed for is of the utmost importance. And with this project we want to help in a comprehensive way to this end by reusing plastic materials and cardboard, we have to understand that there are two types of renewable and non-renewable resources to classify them is done as follows.

Variables: X The usable matter that exists on earth, (x₀) The original quantity of the resource at the time of starting, (a) The speed of generation of the resource, variables and considerations, (b) Exploitation, the speed of consumption and/ or loss of resources, (t) Previous times lead us to propose an algebraic formula. $X = x_0 + (ab)t$. Through this expression we can deduce the following: Case 1 if $a > b$ we have a faster rate of regeneration of the product, it is an over-produced resource Case 2 if $a = b$ we have that the rate of generation is equal to the rate of consumption or loss is a renewable resource, Case 3 if $b > a$, we have the rate of consumption loss is greater than the rate of regeneration this is a case of non-renewable product

Basics for welding machine

In order to describe an electrical circuit in a cathodic protection system, a power source connected to one or more components by means of a wire made of a conductive material such as copper is necessary. The electrical circuit constitutes a power source that will provide us with a force by establishing electrical potential differences across the components of the circuit and we will measure it as follows: current in amps, force and power difference in volts, and resistance in ohms.

Drivers

According to the types of material, the electrochemical reactions of a conductor system will be the electrical conductivity we can associate with a movement of the electric charge is classified into two:

First-order conductors: they are those that have electrical conductance, electrons being the carriers of the charge, for example most metals, graphite, oxides, and their conductivity decreases when there is an increase in temperature.

Second order conductors: These conductors have ionic or electrolytic conductance, and the carriers are the ions. Giving a mass transfer associated with conductivity. And they occur in aqueous solutions with dissolved salts, as an example we have soils and ionic salts, and their conductivity increases when the temperature increases

Firstly, the term voltage is given to the potential of an electrical system and cell galvánica to name devices that transform chemical energy into electrical energy.

From this we understand that a common galvanic cell is made up of two metal parts and a saline solution containing ions called an electrolyte.

The flow of charge can be transferred by means of electrons (electric current) or by ions (ionic current) and an electrolyte is that substance that conducts current by an ionic flow

Welding machine elements Plasma and this composed of anode and cathode that carry the current and that go from the negative to the positive pole, ions metallic that go from the positive pole to the negative, to form gases that become ionized and stabilized as they lose or gain electrons, and of fusion products such as vapors that will help to form a protective atmosphere. It reaches the highest temperature of the process.

In this area that surrounds the plasma and has a lower temperature than it, formed by atoms that dissociate and recombine, giving off heat due to the combustion of the electrode coating. Gives the electric arc its conical shape.

Fusion temperature: the heat action of the arc causes the fusion of the material, where part of it is mixed with the filler material of the electrode, causing the welding of the pieces once solidified.

Crater: Groove produced by heating the metal. its shape and depth will be given by the penetration power of the electrode.

Welding bead: it is made up of the base metal and the filler material of the electrode, and two parts can be differentiated: the slag, made up of impurities that are segregated during solidification and that are later eliminated, and on the thickness, formed by the useful part of the filler material and part of the base metal, the weld itself.



Figure 1 Design and operation of the welding machine

Electrodes: they perform the following functions: proportional the metal so that it can be welded, protect the molten pool from the harmful attack of oxygen, protect the cord from surface oxidation by covering the molten surface (slag) They are metal rods prepared to serve as the pole of the circuit; at its end generates the arc and electric. In some cases, they also serve as a flux material. The metal rod is often coated with a combination of materials that vary from electrode to electrode. The coating on the electrodes has various functions, which can be summarized as follows: Electrical function of the coating. Physical function of the slag, Metallurgical function of the coating.

How does the welding machine work chemically? First the term voltage is given to the potential of an electrical system and galvanic cell to name devices that transform chemical energy into electrical energy. From this we understand that a common galvanic cell is made up of two metal parts and a saline solution containing ions called an electrolyte. These are charged with the power outlet and the water that is ionized with the salt is what conducts the energy and from there the force to be able to weld.

The welding machine uses aqueous solutions with dissolved salts, we began to investigate and we consider that our contribution as an innovation is that it was made with recycled materials and we also observed the need for welding work that has to be done in the bony place that the machine it has to be transported and we came up with the idea of doing it in a 20-liter plastic container for its ease of transportation and we began to carry out the project and be able to land in a practical way that could generate income and we asked ourselves do how?

Taking what already exists and reinventing it in such a way that it is economical and at the same time functional and profitable.

As an example of how to apply the project, it has a house, and the protections, doors, garage railings, etc., for the comfortable and safe stay of the individual or a family in said house. That is where our proposal comes in.

A person who has knowledge of welding and wishes to take advantage of the field left open by the construction of said properties already mentioned will obviously need the right equipment, which we know in advance is not cheap, welding machines that exist in the market from brands such as Lincoln, Miller, Infra, among others, range between 10,000 and 15,000 pesos and it is not easy to get financing these days just with a good idea.

Our idea provides a great reliable, safe, sustainable and economical initial operation "a homemade welding machine" which is easy to transport and has a simple assembly procedure that handles an almost similar amperage between 90 and 105 amps. Which is enough for domestic work and a workshop in proportion, speaking of size, to its productivity. And it has an approximate cost of 300 pesos. See figure 1

Literature review

What is innovation? It consists of a learning process, which arises from an initial level of knowledge from it, new knowledge is created and the products, production processes and business organization are applied.

Technological innovation activities are the set of scientific, technological, organizational, financial and commercial stages, including investments in new knowledge, leading or trying to lead to improvements, an implementation of new or improved products and processes. Nonaka and Takeuchi (1995). Innovation consists of a continuous learning process by which companies. They generate new technological knowledge. Drucker (2005) defines innovation as the organized search and systematically in order to change the opportunities that exist in the environment.

Innovation and the innovative entrepreneur raises six basic sources for innovation, The unexpected: to surprise. The incongruous: the difference between what is and what should be. The need to improve an existing process. The breakdown of an industrial structure changes or market demographic changes. Changes in perception, modality and meaning No to knowledge, as many scientists as scientists. Varela R. (2001). Colombia's national innovation system SNIC, conceives business innovation as a mental disposition, a way of thinking about business strategies and practices that contribute to the commercial and financial success of the company, has an important impact on the technological capital of the company. company and promotes dynamic research and learning processes.

The Oslo Manual, 3rd Edition defines innovation as the introduction of a new or significantly improved product (good or service), a process, a new marketing method or a new organizational method, in internal practices at company, workplace organization or external relations. Due to the change, to the new culture of consumption, and to the technologies that are available.

Innovation Categories: Innovation efforts are mainly divided into 4 categories according to the magnitude of the impact and the term, see Figure 1, which are: 1. Incremental Innovation, 2. Disruptive Innovation. 3. Innovation of business models, 4. Innovation in new businesses.

Typically, incremental innovation efforts revolve around current products and services and are short-lived.

Term, both in its development and in its scope; disruptive ones tend to focus on significant changes or new products and services for the same markets (Christensen, 1997).

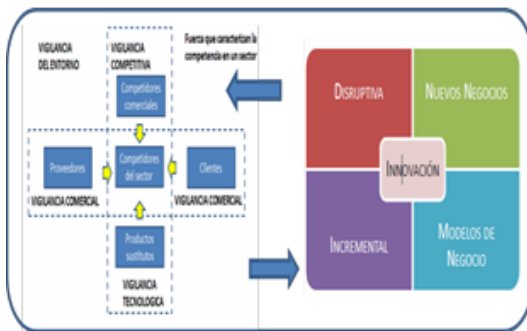


Figure 2 Surveillance types and their relationship with innovation

Technological surveillance. Monitoring is a basic activity in innovation management, it consists of constant external and internal monitoring, see figure 1, it is a systematic process that allows providing good information to the right person at the right time, since often the information is consultation in a disorderly and chaotic manner. Wanting to know everything leads to enormous, expensive and useless work. The company must decide in which areas it wants to be well informed, for that it will have to answer the following questions: 1.- What is the objective of the surveillance. 2.- What information to look for. 3.- Where to locate it. 4.- How to communicate it. 5.- Here in directing it. 6.- What means are we going to allocate.

The competitive surveillance. Deals with information about current competitors and potential, as an example we have, investment policy, entry into new activities or future strategies. Technological surveillance. Information will be received on the technologies available or that have just appeared and can be incorporated into new products and services, processes or focus on the organization. Be systematic, it must be organized with methods in order to carry out a scheduled follow-up. Be structured with a decentralized internal organization based on the creation and exploitation of networks. Palop and Vicente, (1994)

Medollology

Type of study. Documentary research as an essential part of a scientific research process, can be defined as a strategy that systematically observes and reflects on theoretical and empirical realities using different types of documents where data and information about a subject are investigated, interpreted, and presented. specific subject of any science, using for it, methods and instruments whose purpose is to obtain results that can be the basis for the development of scientific creation. The characteristics of documentary research are defined by: The collection, selection, analysis and presentation of coherent information from the use of documents. Carrying out an adequate collection of data and information that allow rediscovering facts, suggesting problems, guide towards other sources of research, guide ways to develop research instruments, develop hypotheses. To be considered as a fundamental part of a much broader and finished scientific research process. Be carried out in an orderly manner and with precise objectives, in order to be the basis for the construction of knowledge. The use of different techniques and instruments for the location and classification of data, to document and content analysis (Hernández, 2006).

Results

We consider that the objective was achieved since when we made the prototype and were able to weld in the maintenance area of the Technological University of Torreón and later in the house of our colleague Edgar Ortega and be able to carry out a small protection we were excited because if it works and we were able to see in a practical way what we studied since many times in school the concepts remain in pure theory.

Conclusions

We realized that the books handle concepts that are sometimes very understandable and sometimes very complicated, so we liked this experience and we hope to be able to continue applying other concepts and putting them into practice.

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