



INTERNATIONAL JOURNAL OF PURE AND APPLIED RESEARCH IN ENGINEERING AND TECHNOLOGY

A PATH FOR HORIZING YOUR INNOVATIVE WORK

OPTIMIZATION OF ACCURATE LOAD WEIGHING DURING COIL HANDLING

VAIBHAV BANKAR¹, KALYANI SENGAR²

1. Asst. Professor, VIT, Nagpur, Maharashtra-441209, India, vhbankar@gmail.com
2. M. Tech student, VIT, Nagpur, Maharashtra-441209, India, kalyanisingh1888@gmail.com

Accepted Date: 27/02/2014 ; Published Date: 01/05/2014

Abstract: Lifting tongs have a pair of primary arms forming a pair of jaws for engagement with a work piece. A latch mechanism interlocks the two arms so that the tongs can be opened and closed automatically by successive movements opening the jaws. Following a first movement opening the jaws, the latch mechanism is engaged to hold the jaws open; the latch mechanism is disengaged by a subsequent movement opening the jaws whereupon it releases the arms to allow the jaws to close. The latch mechanism includes a pivoted latch member mounted on one arm, which latch member is movable between two equilibrium positions to define the engaged and disengaged positions of the latch mechanism.

Keywords: Optimization, coil handling, load weighing.

Corresponding Author: MR. VAIBHAV BANKAR



PAPER-QR CODE

Access Online On:

www.ijpret.com

How to Cite This Article:

Vaibhav Bankar, IJPRET, 2014; Volume 2 (9): 330-334

INTRODUCTION

Bushman model 2020 ID coil lifters lift coils by supporting them on lifting pads. The lifter's legs, operated by an ergonomically designed hand wheel, contract to permit entrance into the core of the coil. The lifter is lowered and one lifting pad is placed under the coil. The operator then turns the hand wheel to extend the legs outward until both lifting pads are under the coil and the legs are pressed against the ID. The coil can now be raised and transported. The legs are held in place with a self-locking adjustment

mechanism that prevents accidental disengagement. Coils must be stored on spacers to permit the lifting pads to extend under the coil for proper engagement. To release the lifter, the legs are retracted until both lifting pads clear the ID of the coil. The lifter can then be raised and moved away from the coil.

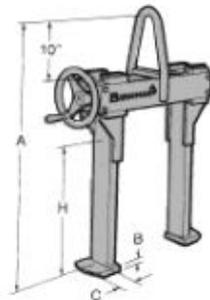


Fig. 1

If use coil annealing furnaces or simply need to store coils in a vertical or "eye to the sky" position Bushman has developed a number of products that enable to handle vertical coils in a safe, efficient and economical manner. Some of these products include Bushman's automatic latch assembly that enhances efficiency by requiring only one person for operation.

In addition to the standard products described below, Bushman provides custom engineered designs to meet specific dimensional, capacity and special application requirements. All of Bushman's vertical lifting equipment is designed to provide rugged service while requiring only a minimum of maintenance. All units are designed and manufactured to meet or exceed ASME-ANSI Standards.

Tong Grabs in the Steel Industry:

The tong is a type of machine that modifies and transforms input forces into desired output forces. Although tongs come in a multitude of shapes and configurations, most of them can be broken down into a simple "four-bar" linkage for analyzing their movement and forces.

There are three basic configurations of tongs: supporting, gripping and pressure.

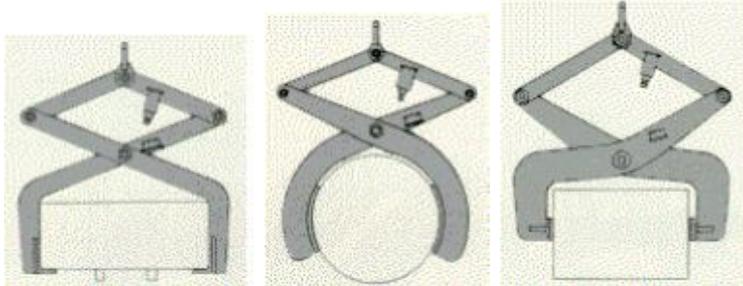


Fig 2. Supporting

Fig. 3 Gripping

Fig. 4 Pressure

When selecting a tong, there are many different mechanical components that should be evaluated for their proper application. The interface between the tong and the load is the focus of a multitude of decisions and problems. For a supporting tong, the decisions are minimized since the load rests on the tong pads and friction or grip ratios are not a major consideration. Gripping ratios may be as low as $\frac{1}{2}$ to 1 for this type of tong. The majority of gripping tongs are equipped with curved plates of varying dimensions to handle different cylinders, pipes and other circular loads. There is a maximum and minimum diameter roll that can be lifted with each grab. If the span of diameters of the different loads is too large, the tong will drag on the floor or adjoining rolls when closing and will slide on the floor when opening. The ratio of small to large roll diameters should generally not exceed eight-tenths.



Fig. 4



Fig. 5



Fig. 5

Problem Identification

- a) Excessive side loading or unequal loading can introduce inaccuracies or damage the load coil.
- b) If the hook can walk on a load pin, the angle of force on the load cell may change slightly, resulting in a change in the output.
- c) To reduce the friction between the bottom side of the Tong and edges of the coil.
- d) By removing the higher frequency interference components, analogue filtering aids in lessening the influence of this noise and interference.
- e) Skilled manpower is required for setting the required diameter.

3. Future Aspects

To reduce the friction between the bottom side of the tong and edges of the coil.

REFERENCES

1. Bushman Equipment, Inc (Vertical Lifting Equipment) USA, Wi 133 N4960 Campbell Drive, Canada 1680 Brampton Street Hamilton On L8h 3s1.
2. Coil Lifter ,Robert C. Pierce, Niles ,Mich, By Mesne Assignment To National Standard Company, A Corporation Of Delaware, Application August 13,1953, Serial No.374,085.
3. Coil Lifter, Warren G. Soley , Greenfield, Wis, Assignor To Indiana General Corporation, Filled May 7,1965, Ser. No. 454,152
4. Leg Assembly For Coil Lifters, Louis G. Kaplan, Evanston Iii, Assignor To Cullen Friestedt Company, Chicago, A Corporation Of Illinois Filled Nov. 3,1960, Ser. No.67,094
5. Vertical Bore Coil Lifting Apparatus, Jonathan F. Eastall, Eastall Precision Engineering Pty Ltd, Filled Oct. 10,2011, Appl. No. 13/269,673.