



INTRODUCTION and OVERVIEW of ICE CRUSHING MACHINE

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ABSTRACT

Today there are many methods used for crushing the ice. These methods are widely used but they have to face many problems and limitations. These problems affect on production rate of crushing of ice. Also these methods are more hazardous and harmful for user. To overcome these problems occurring in present methods we are constructing this machine. This paper presents the design and development of automatic crushing of ice.

Keywords: Automatic, Crushing, Ice, Production Rate

I. INTRODUCTION

With the ever changing weather conditions due to climate change, the already hot and humid climate here in the India is getting even hotter and more humid each year, especially during the summer season. Hence, there has been an ever increasing demand for ice-cold refreshments.

Almost every restaurants, cafes & others eating places, there will be menus of cold drinks. The need of fast serving of cold drinks is essential in this field of business. There are ways to quickly serve cold drink such as refrigeration or by adding ice. Most mobile business use tube ice crushers while most permanent business uses block ice crushers.

Shaved ice belongs to a large family of ice-based desserts made of fine shavings of ice or finely crushed ice topped with sweet condiments or syrups. The dessert is consumed world-wide in various forms and manners. Shaved ice can also be mixed with large quantities of liquid to produce shaved ice drinks. Shaved ices are sometimes confused with "Italian ices". The shaved ices are made from plain ice and are flavored after being shaved at point of sale; whereas the Italian ices, also known as "water ice", have the flavor incorporated into the ice and are usually not flavored after production.

II. LITERATURE REVIEW

The purpose of this chapter is to study the parameters that are involved in designing the ice crusher machine. The scope of the project is based on the objectives that are stated in the first chapter. The relevant subjects are

subjects are studied to be used as a guide for this project. This chapter is also focus on the principle operation of ice crusher machine. A few examples of existing ice crusher machines will be studies in order to design the ice crusher machine.

In the paper of Machine Design, 3rd Edition Adams, Eugenes& Paul Howard Black stated that the machine existing has number of problems including the machines are dangerous because they are open constructed. In 2009, in the paper of 'One Hundred years of craving snow cones from Texas to Tokio' Amy Chozick stated that the machines available are not fully automatic.

III. OVERVIEW OF ICE FORM AND PROCESSING

The forms of ice commonly can be divided into three categories. Ice blocks, ice tube & ice flake. The purpose is to serve as cold drink & beverage applications.

The traditional form of ice block, It is formed in the can which the dimension & temperature is usually selected to give a freezing period of between 8 to 24 hours. The weight can vary from 12 to 150 kg depending on requirements. The thicker the block ice would result of longer freezing time. Design fabrication of ice crusher applications. With an appropriate ice crushing machine, the ice block can be reduced to any particle size without the guarantee of uniformity in size. In some situations, ice block may also be reduced in size by a manually picking the ice block using ice-pick.



Fig. Ice Crushing By Mallet

IV. PROBLEM DEFINITION

In order to serve fast cold drink, the user just needs to add ice in their drink as a simple alternative rather than using freezer. Ice crusher machine is the way to crush the ice into the small texture. The smaller the ice texture the faster it cools the drink. Ice crusher machine can be divided into two major types that are ice block crusher machine & ice cube crusher machine. However, the existing ice crusher machine still having problems in terms of safety, mechanism of motion, texture of ice produced & the maximum size of ice that it can be hold for producing ice flakes. This project is focusing on redesigning and constructing a new block ice crusher machine.

Therefore, several of the problems of the existing machine need to be reduced and eliminate. Several parameters are discussed and analyzed in order to build the new machine in term of cost, material selection and manufacturing selection.

V.CONSTRUCTION

The prime components of machine are roller containing chiseled spikes which are actually crush the ice, side plates & prime mover.

Roller is connected to prime mover with the help of V-belt mechanism. Roller is rested on the casing made by specific material. Roller & shaft are connected to each other with the help of welded circular plates. Side plates are designed as that they should cover the block ice which will be crushed. Roller has chiseled spikes which impact the block ice & reduce the size of block.

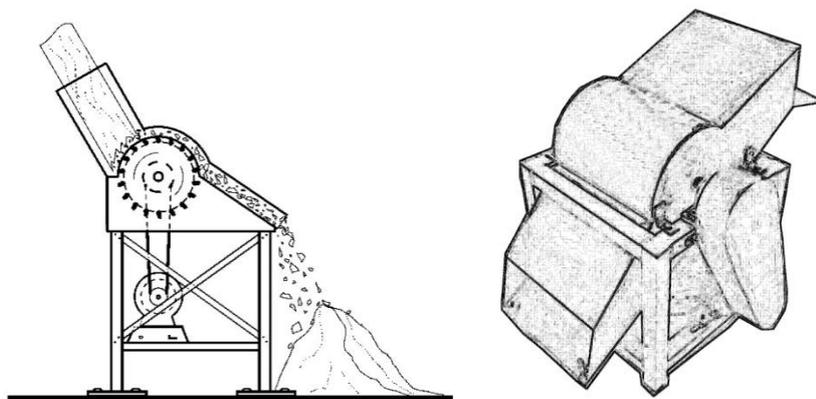


Fig. Layout of machine

VI. WORKING

1. The ice block is inserted in the machine opening which is present as the above of the machine.
2. The prime mover drives to the roller, the spikes present on the roller crushes the inserted ice block.
3. The crushed ice is push by the rolling part which pushes the ice flakes to the downward direction.
4. This crushed ice is collected in the container.

VII.ADVANTAGES

1. The tool is portable.
2. Production rate is increased compared to the manual.
3. Less space is required.
4. Fatal is reduced.
5. Skilled labour is not required.

VIII.DISADVANTAGES

1. Life of weld joint is less.
2. Possibility of accidents.



3. Idle time is more.

IX. USES OF CRUSHED ICE

1. Bar ice crusher is widely used to shave the ice for the drinks that contains only spirit as the main ingredients without any employment of water and other fluid.
2. Crushed ice also goes well in a cocktail mixer to make a slurry and thick cocktail 'Adult Snow Cone' is an authentic cocktail drink produced by the crushed ice.
3. A glass is used to pack crushed ice and liquor is poured over to make a slurry drink. Amaretto, PAMA' per mouth, wine' and Chambord are the few spirits that can be employed alone with shaved ice or can be combined to produce a unique flavor.

X. CONCLUSION

We have studied the previous 'ice forming & ice shaving processes' and designed efficient 'ice crushing machine'. Also we have constructed a machine which will decrease the human efforts and increase the safety and production rate of ice crushing machine. Flywheel used in this type gain of momentum power consumption will be reduced.

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