DESIGN OF FOLDABLE SHIPPING CONTAINER

Ritika Deshmukh\textsuperscript{1}, Vaishnavi Ambulkar\textsuperscript{2}, Rushikesh Pahade\textsuperscript{3}

\textsuperscript{1,2,3}Yeshwantrao Chavan College Of Engineering, Nagpur, India.

\textbf{Abstract:} A rectangular collapsible shipping container that are capable for safely, stably and securely carrying goods and are capable of being easily collapse to save the space after unloading the goods. These collapsible shipping container mainly includes sidewall panel, back wall panel, roof panel and front door panel. Side wall panel are made to fall inward on the bottom panel of the container and then the roof is lifted upwards using crane. The front and back door folded inward along with roof panel, so that it can make plain sheet type structure. Due to these the containers can easily transported from one place to another and required less place for storage along with less efforts. It can easily be created during the time of loading.

\textbf{Keywords:} Rectangular collapsible shipping container, Sidewall panel, Backwall panel, Roof panel, Front door panel

\section{1. Introduction}

Containers are the fundamental part of the total shipping industry, trade and transport. These shipping containers are the metallic structures that store different kinds of cargo that need to be shipped from one place of the world to another using different kinds of container ships. Mostly, all shipping containers are made from steel and have closed-top with hinged doors. They have corrugated walls on the top and bottom sides and are welded to the rails and end frames. The main disadvantage of conventional shipping containers which are formed by rigid structures is that the containers which get empty after reaching their destination has to be transported to the point of loading where they can be reused. The requirement to reposition containers which are empty poses one of the most lasting problems in the container transport industry. Transportation of empty containers involves high costs. So when the containers are returned, they are empty. All this has accomplished is an unfortunate waste of time and money, as each empty container takes up space that could be used to transport other goods. Therefore, foldable containers are a good option from the point of view of saving transport costs as well as storage and handling cost.

\section{2. Objective}

1) To develop a foldable shipping container model which can easily be collapsed and erected with less efforts.

2) To reduce the transportation and storage cost of shipping containers.

3) To reduce the cost and difficulty of handling the empty shipping containers.
2. Problem Statement

Storage and shipping of empty container is a significant problem in shipping industry. Due to which transportation cost and storage space are unnecessarily utilized. Our project aims to design a foldable shipping container that could be utilized with existing roadway, sea and rail equipment but require less space for shipping and storing would be economically advantageous. Additionally, a collapsible shipping container that was both lightweight and collapsible would not only save storage volume, but also on fuel costs for transporting full or empty shipping containers.

3. Background

1. Field of Invention

The current invention are related generally to reusable and containers for the transportation of cargo, and more particularly to collapsible cargo shipping container capable of carrying large quantities of goods when in use and is capable of being collapsed to compact storage when it is not in use.

2. Description of the Prior Art

Standard shipping containers are designed for transportation of general cargo on Sea ways, railways and roadways. The ISO standard shipping containers used around the world are made basically from steel, either 20 feet or 40 feet long, 8 feet 6 inches wide, and 8 feet tall, with high-cube containers for bigger volume and lightweight cargo are 9 foot 6 inches high. A feasible percentage of cost for shipping and storage of goods is in transportation and storage of the empty containers. The volume of international trade continues to increase with approximately 91% of non-bulk cargo world-wide moved via over 18 million shipping containers stacked on the transportation ships. However, the Volume of goods shipped between countries is not always equal. Therefore, many shipping containers to be shipped around the world are empty.

4. Methodology

Collapsibility of shipping container is done in vertical manner.

Step1: The side wall panels are made to fall inwards on the bottom side.
Step 2: The roof panel is lifted with simple crane lift mechanism.

Step 3: After the roof panel is lifted to a certain height the front door and back door are folded inwards on bottom panel.
Step 4: After the doors are folded the roof panel also collapses downwards and thus shipping container is folded.

5. Literature Review

(1) COLLAPSIBLE SHIPPING CONTAINER [1]

There are many efforts to reduce the cost of repositioning empty containers, one of which is a foldable container. This paper proposes a robust formulation for the empty container repositioning problem considering foldable containers under demand uncertainty.
(2) A LARGE-CAPACITY FOLDABLE TRANSPORT CONTAINER [2]

Foldable containers have the potential to enhance the cost efficiency of the logistics industry and improve the problem of space allocation at seaports.

6. Acknowledgement

Authors are thankful to their Guide of Mechanical Department Prof. A. J. Bamnote Sir from Yeshwantrao Chavan College of Engineering, Nagpur for guiding us throughout the project.

7. References
