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Review Paper on Automatic Three-Way Pneumatic Dumper Mechanism

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Abstract: ***In construction sites there is a use of dumper for loading and unloading a material like sand, gravels, and other infrastructure materials. But they still used manual operated conventional dumper to dump the materials. they are dump material only in one side only that is rear side and that's the reason sometimes it's quite difficult to dump material in some compact places where the convention dumper is difficult to used. And this research paper mainly focused on above mentioned difficulty. To deal with this we are making a automatic three way pneumatic dumper mechanism so that they can be dump material in rear side as well as left and right direction also. and with the help of Arduino software the motion of the dumper can automated instead of manual use. It can be reduce labour work, save time, and increase the workability.***
Keywords: Arduino software, conventional, automated, pneumatic dumper, compact.

I. INTRODUCTION

A dumper is a vehicle designed to transport a large amount of material, mostly on a construction site. A dumper is usually an open 4-wheeled vehicle with a load skip in front of the driver, while a dump truck is in front of a taxi load. They are usually diesel powered. The site is fitted with towing eye for secondary use as a tractor. Dumpers with rubber tracks are used in special situations and weigh more uniformly than tires.

The payload of the early British dumpers was about a ton and it was 2-wheel drive, running on the front axle and running on the rear wheels. Single cylinder diesel engine (sometimes made by Lister) started by hand cranking. The steering wheel turned the rear wheel, not the front. There wasn't much wrong with not being electric or hydraulic.

Modern dumpers have payloads up to 10 tons and they usually run clearly in the center of the chassis (pivot steering). A-frame, also known as ROPS (Rollover Protection) frame, can be mounted on the seat to protect the driver if the dumper overturns.

II. LITERATURE REVIEW

The study of S. N. Waghmare et al declared that during their study of the conventional mechanism of dumper that are use not that much active and there is lacking of new invention and the technology. The study is taken into consideration of several automobile workshop. They are shows on their study some difficulties while unloading the material. This review paper mainly focused on above difficulty. That's why the prototype of such suitable arrangement has been designed. The dumper can and unload material entire the three direction. The mechanism of three way dumper can be controlled by with the help of providing side ways to the mechanism. This mechanism can be usable in compact areas also.

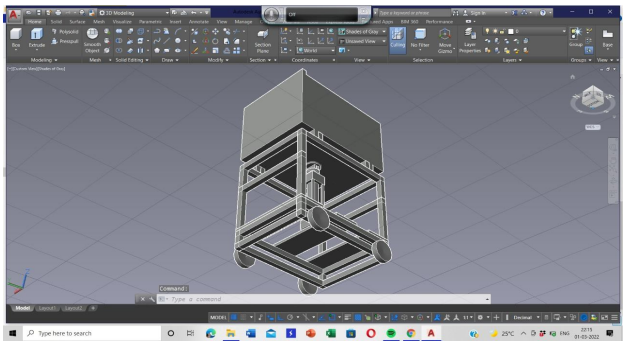
Prof . R. S. Ambade et al has started this project work and they named their project "Universal Modern Trailer" . they can seen difficulties in unloading of the material. The mechanism can unload material only in one direction. And its face some difficulties In compact areas . to overcome this problem the three directional dumper mechanism has designed.

III.METHEDOLOGY

The production of structural steel can be carried out in a shop or on a construction site. Steel production the work in the shops is precise and of high quality, and the field work is proportionate of inferior quality. In India, construction site construction is also most common on large projects cheap field work, high transport costs, difficulties in transporting large members, higher excise duty on products from trade. Favourable taxation for on-site work is a major financial incentive to create a website. The methods used in making the site are similar, but at the level of sophistication on-site equipment and environmental control would normally be less. Also the skill of the staff on site is inferior, so the quality of the final product is also relatively poor. But In-store manufacturing is efficient in terms of cost, time and quality.

1) *Three ways Tipper Mechanism:* The compressor reaches the compressed air by the direction control valve. The direction of flow changes according to the valve position handle. The compressed air passes through the direction control valve and enters the front end of the lifting stroke. At the end of the lifting stroke, air from the valve reaches the rear end of the cylinder block. The pressure remains the same, but the surface is smaller due to the presence of a piston rod. This puts more pressure on the piston, it pushes faster so a faster return stroke is enabled. The stroke length of the piston can be changes by making suitable by adjustment in the hand liver valve operating position.
2) *To Automate the System:* An Arduino is the circuit device which is used to create a connecting module. And get the command as the electronic signal and process the signal into the command to the device work as the command given by the user. An Arduino programming is mainly done in the Arduino software also known as (Arduino uno).
3) *Components used:* The automatic three way dumper mechanism can includes following components

a) Arduino Circuit
b) Pneumatic Cylinder
c) Direction Control Valve
d) Flow Control Valve
e) Air Compressor
f) Switch mode power supply
g) Centre lock actuator
h) Connecting hoses
i) Pneumatic Connector
j) Pneumatic Muffler
k) Toggle switch



IV. APPLICATIONS

A. Construction sites.
B. Infrastructure work
C. Landscaping and Ground Maintenance

V. FUTURE SCOPE

A three-axle pneumatic trailer is possible on the current system. Having a ball and socket or universal joint at the piston end of a pneumatic cylinder using an external compressor, the introduction of a single hydraulic tire cylinder can make the system a little more efficient. Another change what can be done is to insert a few rollers between the cargo cabin and the vehicle body. This setting will make it easier to rotate the cargo cabin and thus the rotating disk will no longer be there experience the full load.

1) It can be fully automated by using microprocessor circuit.
2) The direction of the dumper and controlling its unloading condition can be controlled by using various sensors.

VI. CONCLUSION

The operation of this system is very simple, so anyone can manage it. Author using several techniques, they can be modified and developed according to the application . The automatic three way pneumatic dumper mechanism are used to unload the material. It can be used for variety of purposes such as construction sites, infrastructure work, ground maintenance etc. This mechanism can save time and electricity.

VII. ACKNOWLEDGEMENT

We would like to thank our guide Prof. S.G.BAWANE who gave this opportunity to work on this project.
we are learn a lot from this project about Automatic three way pneumatic dumper mechanism.

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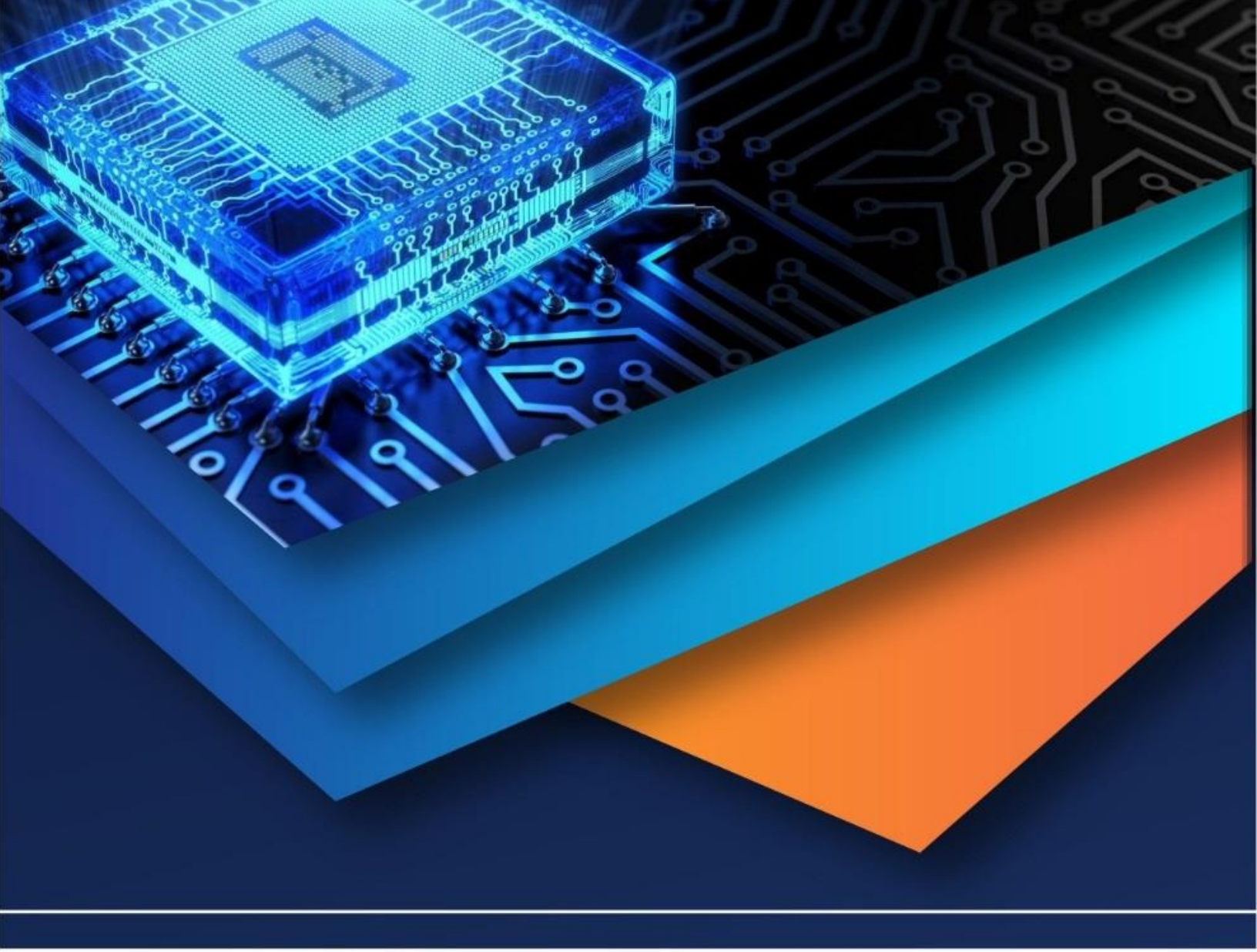

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