iJRASET
International Journal For Research in
Applied Science and Engineering Technology

INTERNATIONAL JOURNAL
FOR RESEARCH
IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 9 Issue: V Month of publication: May 2021

DOI: https://doi.org/10.22214/ijraset.2021.34228

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 9 Issue V May 2021- Available at www.ijraset.com

Cricket Bowling Machine without Electricity

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Abstract: In our project, a cricket bowling machine is designed which can provide support to the batsmen to develop their batting skill. The machine will be capable of generating different patterns of bowling. This machine is capable of bowling with season ball also.

Ball pitching devices have been used in sport practice from many years. The aim of this project is to design a cheapest ball pitching system ever to throw the balls by using manual power at different suitable adjustable speeds for the cricket practice. Typically, balls are thrown from a device using motors, discs and swing can also be set by the operator. The report shows all the design criteria to develop a professional manual powered cricket-pitching machine.

Keywords: Surprise element, Ball pitching, aerodynamic, dimpled polyurethane ball, gunpowder-powered.

I. INTRODUCTION

Cricket as you would expect, a lot of the work is invested in one's cricket skills on practice pitches in the nets. To actually be able to improve, every batsman either needs a skilled bowler to bowl at them or a bowling machine.

There is a big difference between a bowler and a bowling machine. A bowler will keep bowling different deliveries, vary the point and pace of delivery, and use a real cricket ball so the batsman can practice. Electric bowling machines, on the other hand, can't be moved around much, and can't use real cricket balls. They use a dimpled polyurethane ball that looks like a slightly large golf ball, which players say doesn't behave like a real cricket ball. It's great at bowling a consistent length so you can work on specific weaknesses, but it isn't ideal to simulate a match situation.

Our bowling machine looks like a metal contraption that belongs on the sets of a medieval fantasy film, but when it bowls should be much harder to face than electric bowling machines. They will get to practice with a real cricket ball, which adds a lot to their training. At the international level, 130kph is not a pace that will trouble any batsman. Bowling machine can't hit 140-150kph, which is the speed most international team fast bowlers bowl at.

The art of cricket bowling is complex and arduous owing to the run-up and ball release time energy requirement to achieve speed and variations. Therefore, human bowlers cannot bowl for extended periods and numerous mechanical bowling machines have been built to help batsmen improve their skills during practice sessions. However, most of these existing machines are designed for spherical balls ignoring the distinguishing physical feature of a cricket ball: the raised equatorial seam, which makes it less of a sphere. The bowlers are known to often benefit from this seam in their pursuit to taking the batsmen's wicket by imparting swing, spin and bounce variations along-with other bowling variables. This lack of the seam consideration creates a void between human and mechanical bowling. In this work, we present design and development of an automatic bowling machine to make mechanical bowling more realistic. This machine ensures ball seam position as well as fulfils other constraints. Ball pitching and seam position accuracy results underscore the suitability of this design to enhance the capabilities of mechanical bowling. This is very close to playing in the nets with a real ball, they don't want the batsman to anticipate and be ready. The surprise element which the bowler creates, that should come in the machine. If I tell (a batsman) that I am going to bowl good-length for 100 balls, mentally he already is going to be prepared. Nobody is going to tell you that in a real match.

II. LITERATURE REVIEW

The research works related to this problem in several sports are explained below.

In 1897, mathematics instructor Charles Hinton designed a gunpowder-powered baseball pitching machine for the Princeton University baseball team's batting practice.[1] According to one source it caused several injuries, and may have been in part responsible for Hinton's dismissal from Princeton that year.[2] However, the machine was versatile: it was capable of throwing variable speeds with an adjustable breech size and firing curve balls by the use of two rubber-coated steel fingers at the muzzle of the pitcher.[3] Hinton successfully introduced the machine to the University of Minnesota where he worked as an assistant professor until 1900. The arm-type pitching machine was designed by Paul Giovagnoli in 1952, for use on his driving range. Using a metal arm mounted to a large gear, this type of machine simulates the motion of an actual pitcher, throwing balls with consistent speed and direction. One- and two-wheel style machines were originally patented by Bartley N. Marty in 1916.

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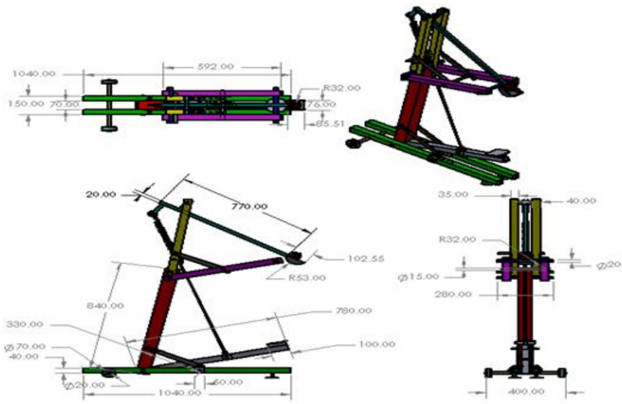
III. PROPOSED METHODOLOGY

The structure of the architecture diagram is shown in Figure.



When assembled and armed for delivery, it's around 1.7m tall. To arm the Bowling machine, you have to pull its sling down and lock it in position. Then, you push a metal plate down with your leg to lock it in place. Now you can place a ball on the plastic cup on the sling and signal to the batsman that you are ready to bowl. This signal is very important as the Bowling machine's sling moves much faster than any bowler's arm. Then, you pull the trigger and "bowl" the delivery. The rotation of the Bowling machine's arm is quicker than the arm rotation of a bowler. "Playing with this improves (a batsman's) reaction time. You can place the ball with the seam in different positions to simulate different deliveries that bowlers bowl. There's a screw under the plastic cup on the sling, which can be tightened or loosened to adjust the length of the delivery. Similarly, the machine has three hooks, which let you vary the speed between 110 and 140 kmph.

IV. RESULTS

A. We developed a non-powered system at low cost lightweight, portable, accuracy, repeatability and precision both outdoor and indoor use safety guard is also designed to that machine for safety use
B. We have make a market research or analysis of the existing products
C. We designed a new cricket-bowling machine for practice to develop reaction and techniques.
D. We have set out a comprehensive design methodology for all the phases of the product specification, product planning, product design, and development of the manufactured processes for the technical system.
E. We now know the aerodynamic of the ball and the force applied to the ball.
F. We created a conceptual drawing and how to find out a non-powered system to propel the ball in the proper way.
G. We developed, design and test a non-powered system for controlling the speed.
H. We created detail CAD drawings.
I. We produced an assembly drawing for the device.
J. We defined the manufactured processes and calculated the costing.
K. We drawn up the conclusion and results for the machine.

Parameters	Traditional bowling machine	New bowling machine
Power required	Consumes electricity	Consumes man power
Weight	45 – 50 kg	30 kg
Size	Bulky	Compact
Mobility	Since it is not foldable, it has less mobility.	It can be folded, hence easy to carry around.
Cost	Over Rs 1 lakh.	Around Rs 20,000
Ball used	Dimpled polyurethane ball.	Leather ball.
Surprise element	Batsman knows which type of ball will be bowled.	Batsman doesn't know which type of ball will be bowled (like in real match).

V. ACKNOWLEDGEMENT

We would like to express our special thanks of gratitude to our teacher Mr. Harshal Ahire, who gave us the golden opportunity to do this wonderful project of BOWLING MACHINE WITHOUT ELECTRICITY.

Who also helped us in completing our project. I came to know about so many new things, we are really thankful to them.

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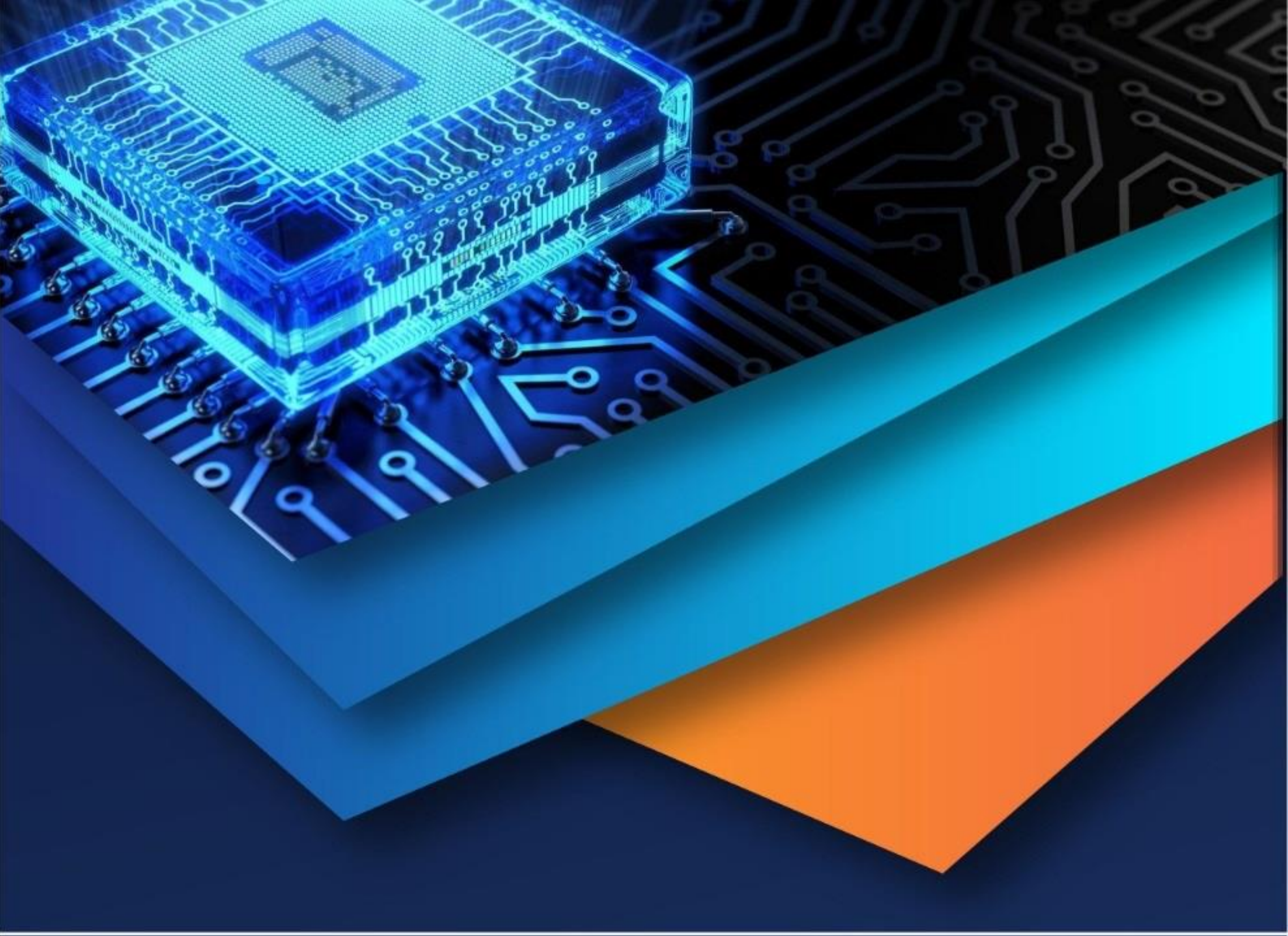

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