graph

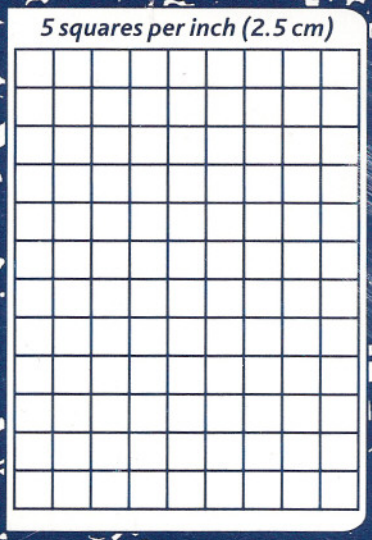
composition book

536 BSOD

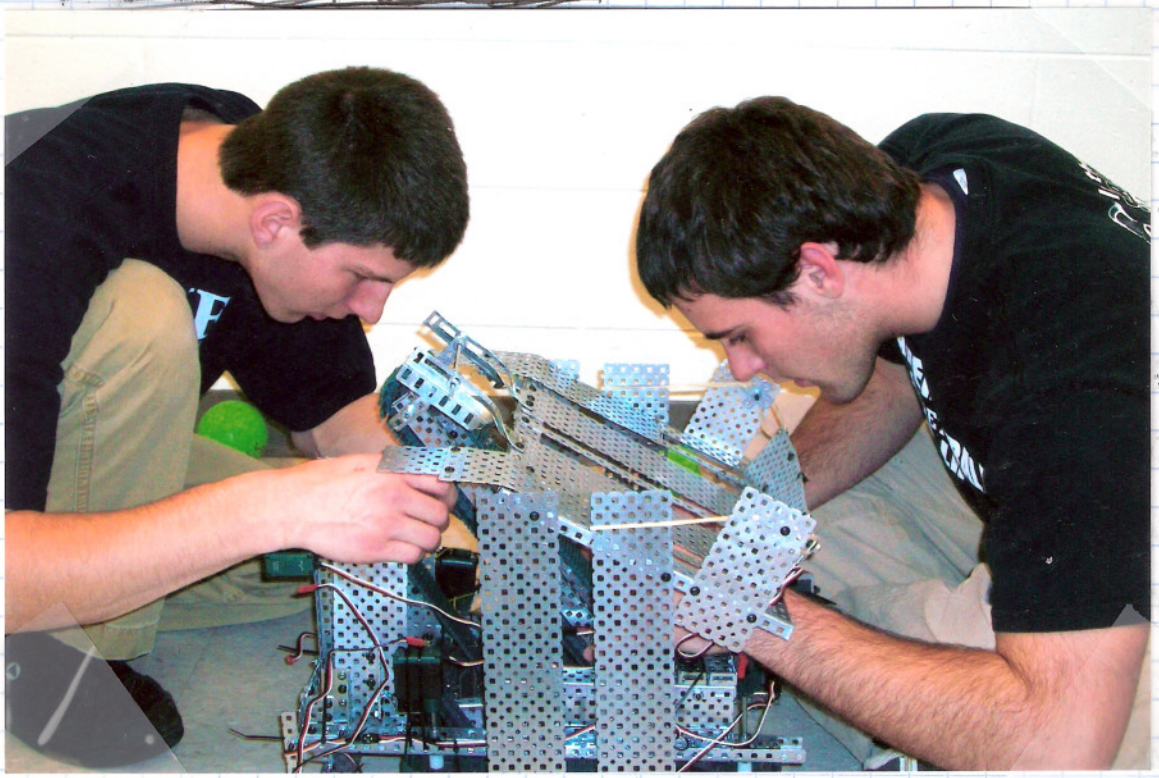
XAVIER ENGINEERING NOTE BOOK

100 sheets

7 1/2 in x 9 3/4 in (19.1 cm x 24.8 cm)



THE TEAM: ENGINEERS



There are three major engineers involved in the construction of this robot.

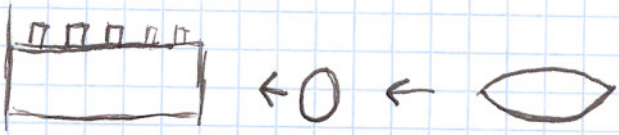
① Tyler Andrysczyk, senior at Xavier High School, is shown on the ~~left~~ right. Tyler is the Head Engineer.
② Rob DeBruin, senior at Xavier High School, is shown on the left. Rob is a new recruit but valued part of the team.
③ Lucas Dvoracek, a freshman at Xavier High School, is not shown because of a lack of photo. Lucas is Tyler's prodigee and is being trained for next year's robotics team. (Page 22)
④ Philip Kim, or Kim Dong Yeon is a new recruit to robotics and joined the day after he arrived in America. He has taken a liking to robotics and has done well in his freshman year at Xavier. (Page 25)

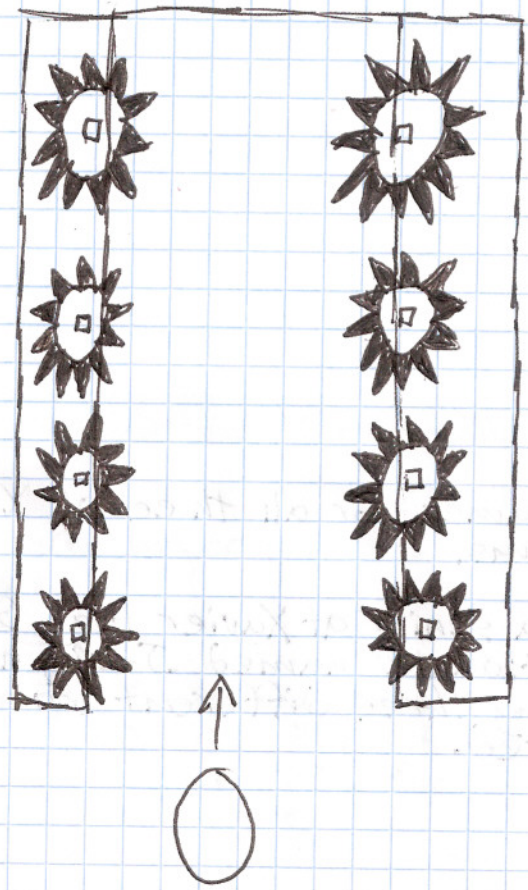
PROGRAMERS

There is only one programer for all three of Xavier High School's robotics teams.

① Jonathon Lorenz is a senior at Xavier High School and is shown above. Affectionatly named J-LO, he has his hands full programing three different robots, and is extreemly appreciated.

IDEA #1 RUBBER STAR COLLECTION





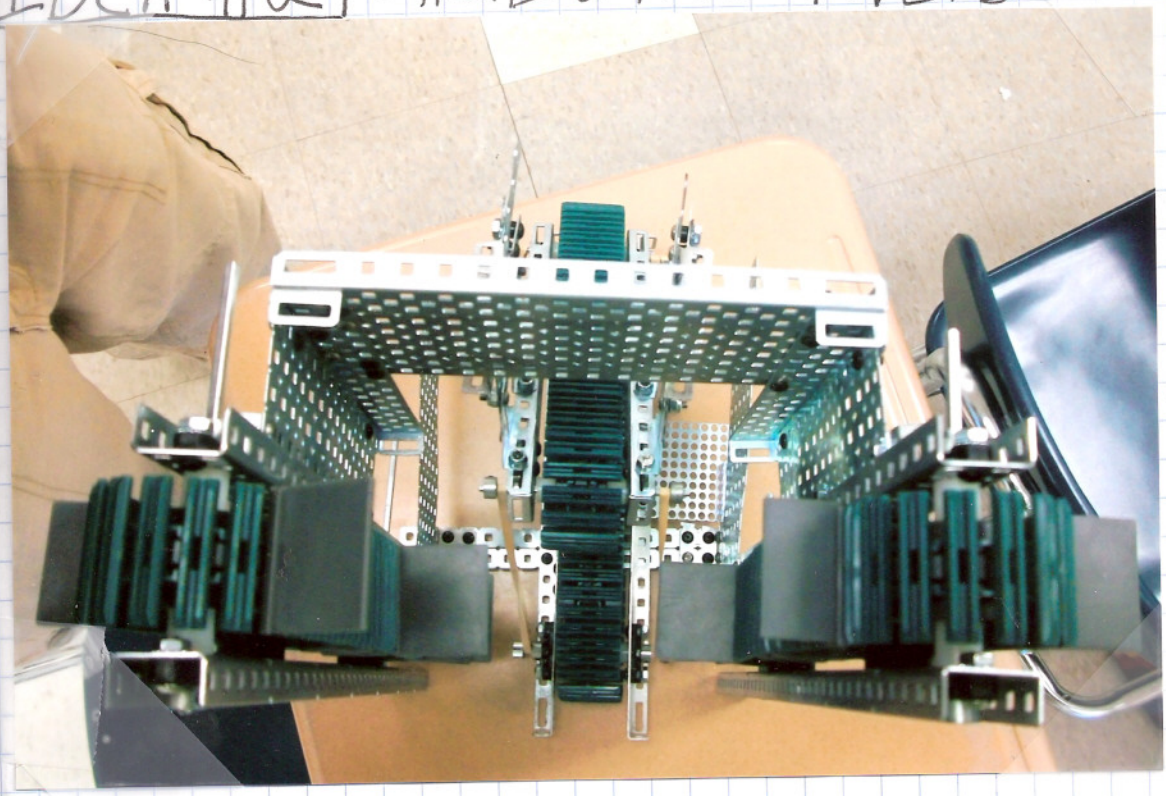
Why we Chose this design?

- The collection would include both green and orange balls.
- It is very flexible.

Why it wasn't used?

- There was a shortage of axil's used to suspend the collectors.
- It was extreemly hard to run all collectors off one motor.
- The design was too bulky and big.

IDEA #2: HORIZONTAL TREDS



Explanation: This design replaced the rubber black collecters with a pair of tank treds turned horizontally. Multiple grey rubber protrutions were added so as to give our robot the ability to collect both green and orange balls.

Why we chose this design?

- It saved space relative to the previous design.
- It picks up multiple green and orange balls.
- It required much less axils, solving the shortage of materials.

Why it wasn't used?

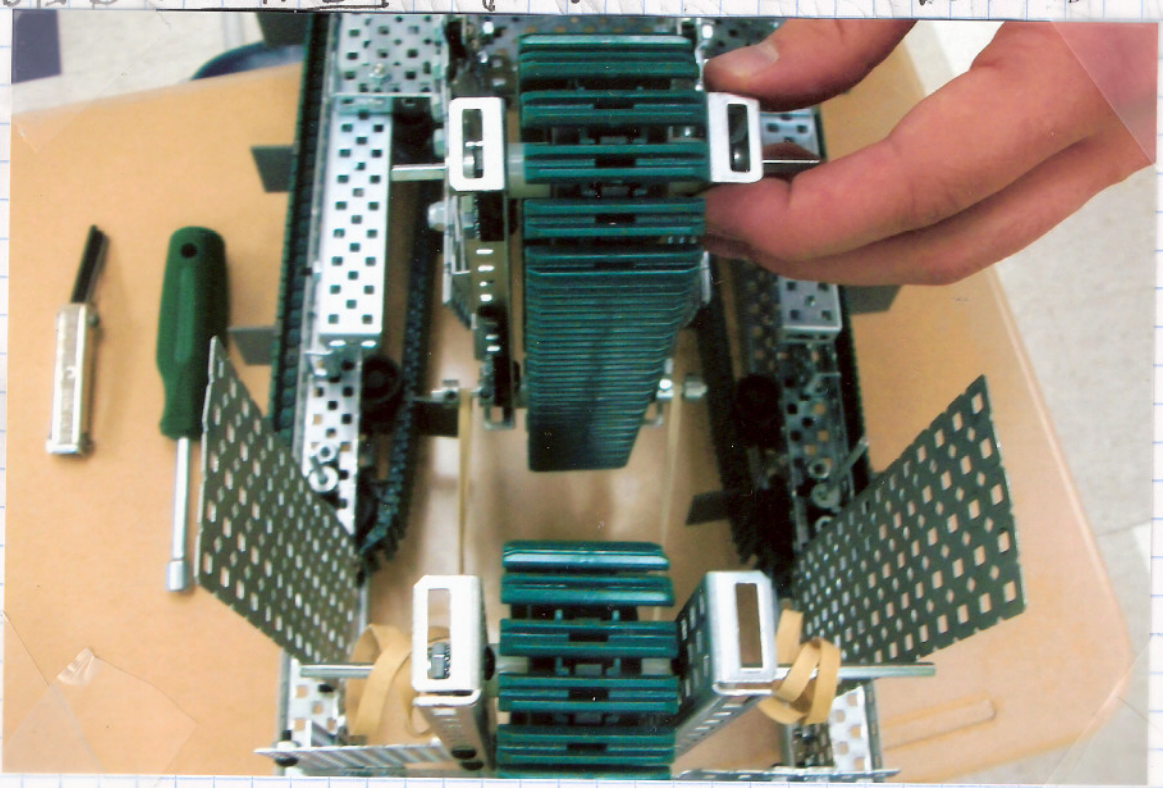
- ~~Currently~~ in use

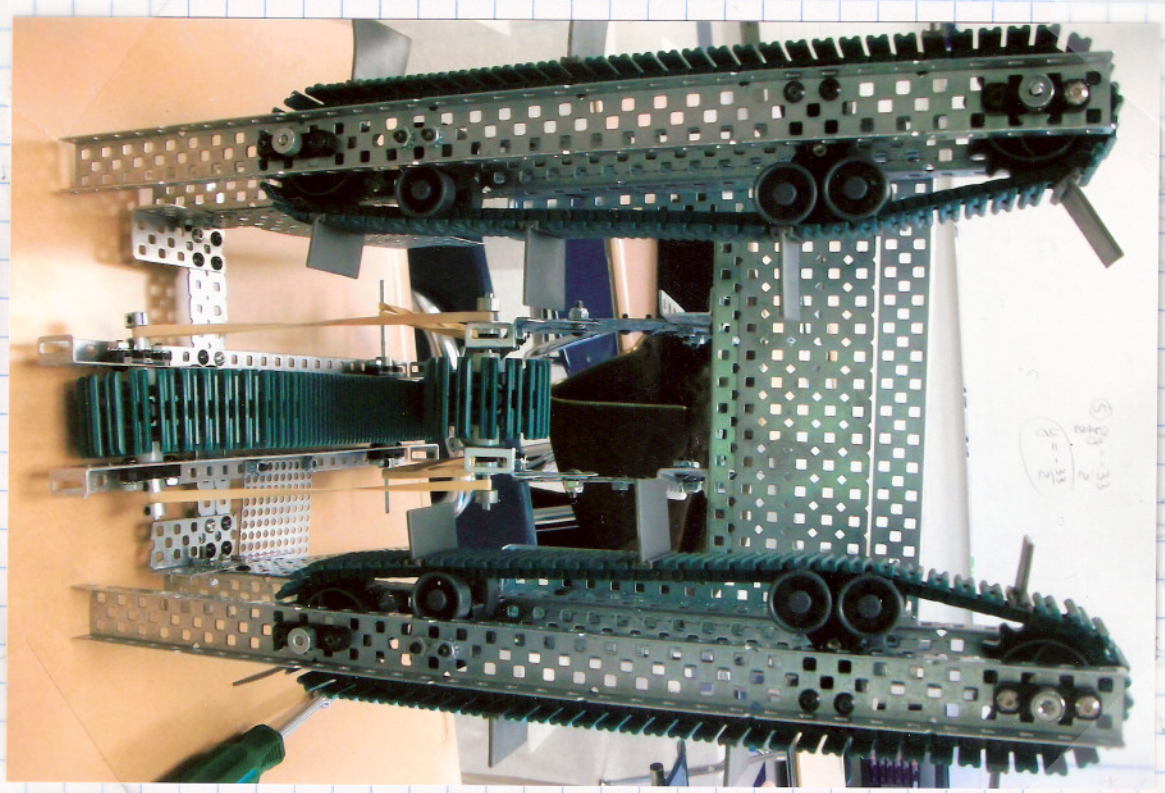
REVISED: Balls Jammed and collection was too slow.

Problems

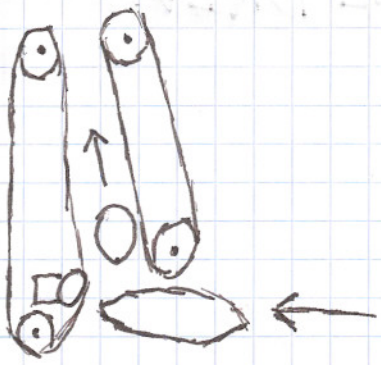
- a little big and bulky
- Difficult to attach motors.

6 IDEA #3: VERTICAL TREDS





Sketch #1



Sketch #2

Explination:

This Idea was formulated to take the balls from the horizontal collection device and transport them vertically This is to be used to get the balls over the 11' wall. These treds were not given any rubber protrutions because the first time tried, it worked pirfectly for the green balls (the smaller.)

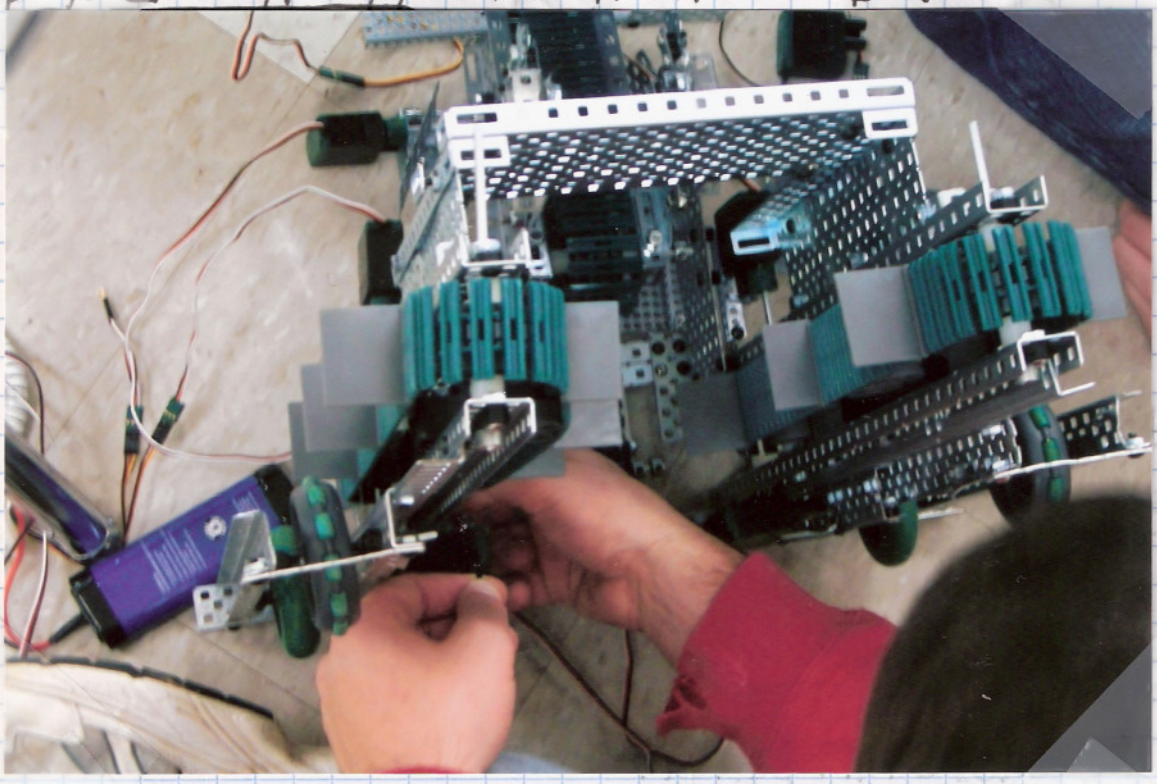
Why We Chose this Desiga?

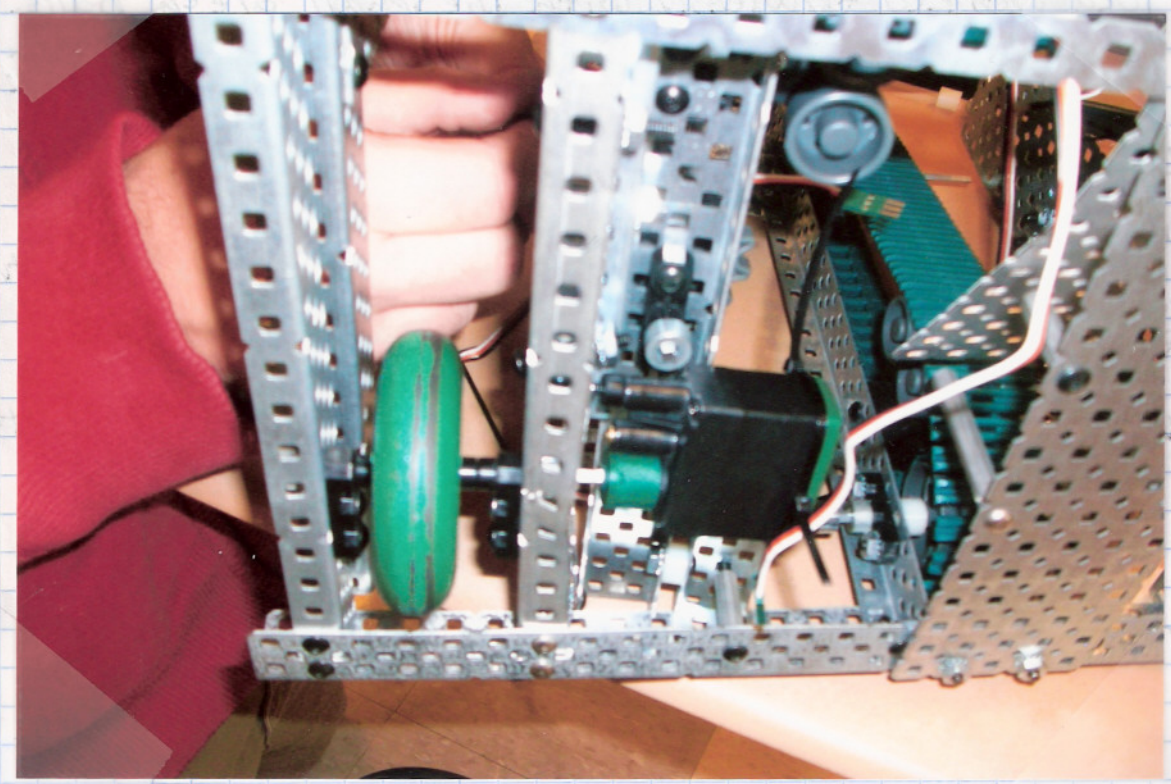
- This idea worked flawlessly with the small green balls.
- Rubber bands could be used to possibly pick up orange balls.
- Fed green balls nicely up the treds and into a collection basket.

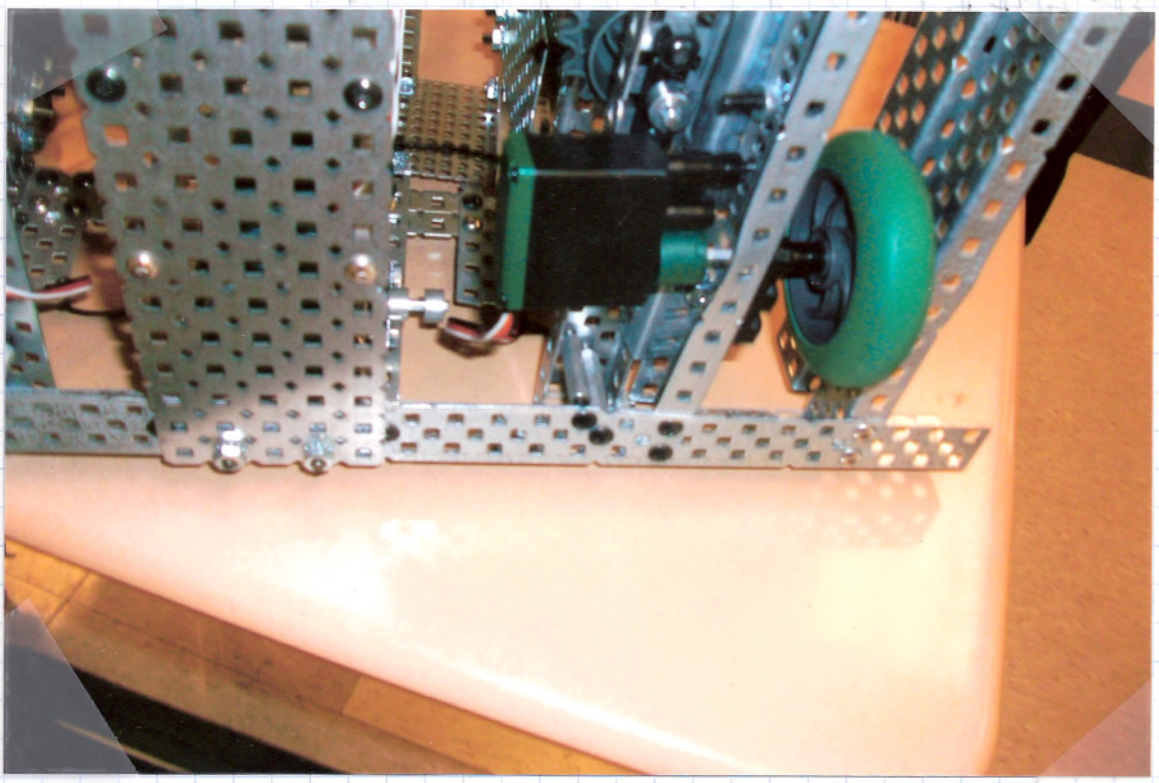
Why it Wasn't Used?

- It only worked for green balls
- The nose of the orange was pushed down, not allowing assention.
  - seen in Sketch #2
- The Rubber bands restricted all ball collection.
- Loss of Rubber bands means a loss of flexability.
- Was Unable to collect orange balls dispite multiple adjustments.

8 IDEA #4 REAR WHEEL DRIVE







Explanation: Two small rubber wheels were attached to the rear of the robot and two omni-directional wheels were attached to the front of the robot. The front omni-directional wheels are free-flowing.

Why we chose this Design?

- All previous years robots used rear wheel drive.

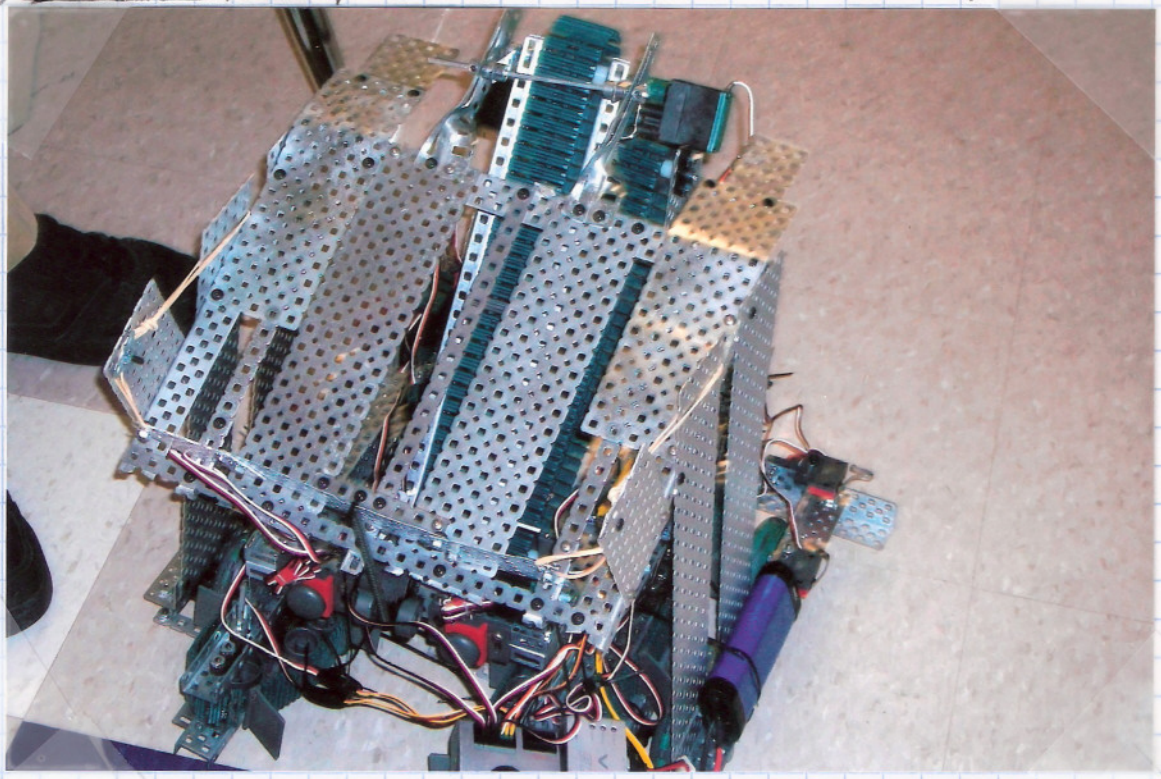
Why it wasn't used?

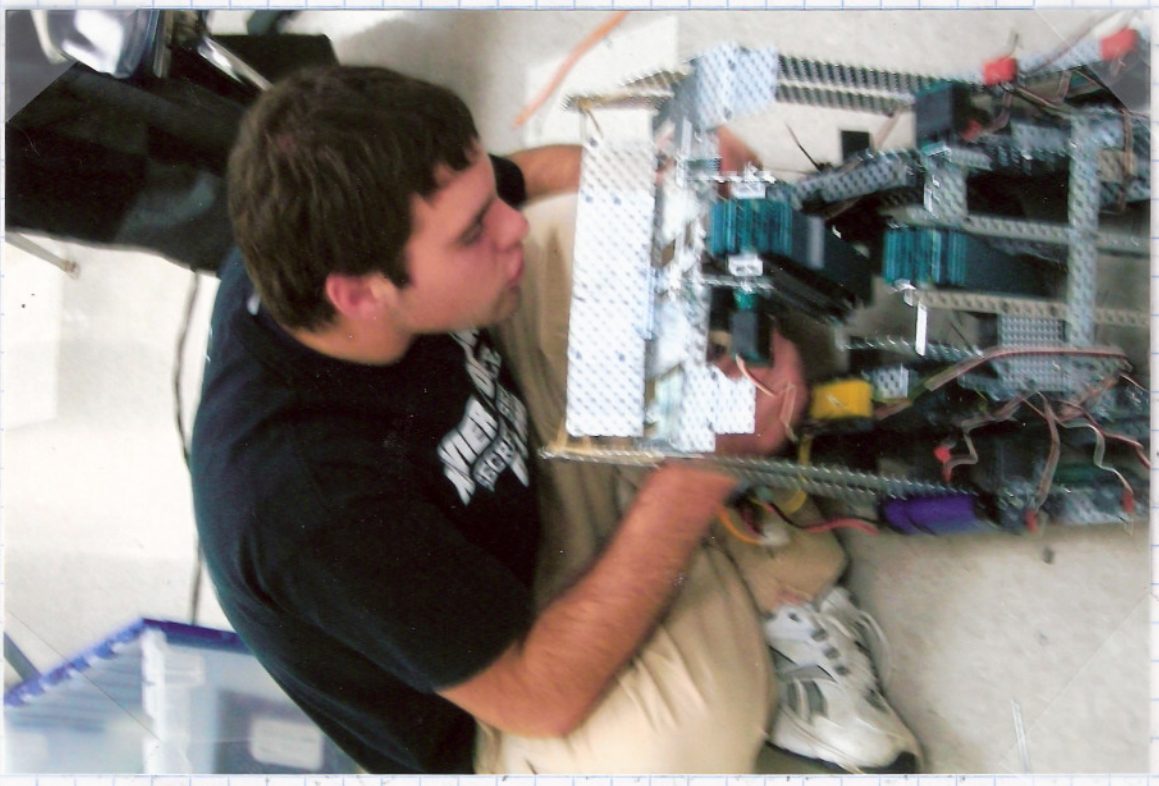
- Rear wheel drive slowed the robots turning abilities.
- Greatly slowed down Robot.

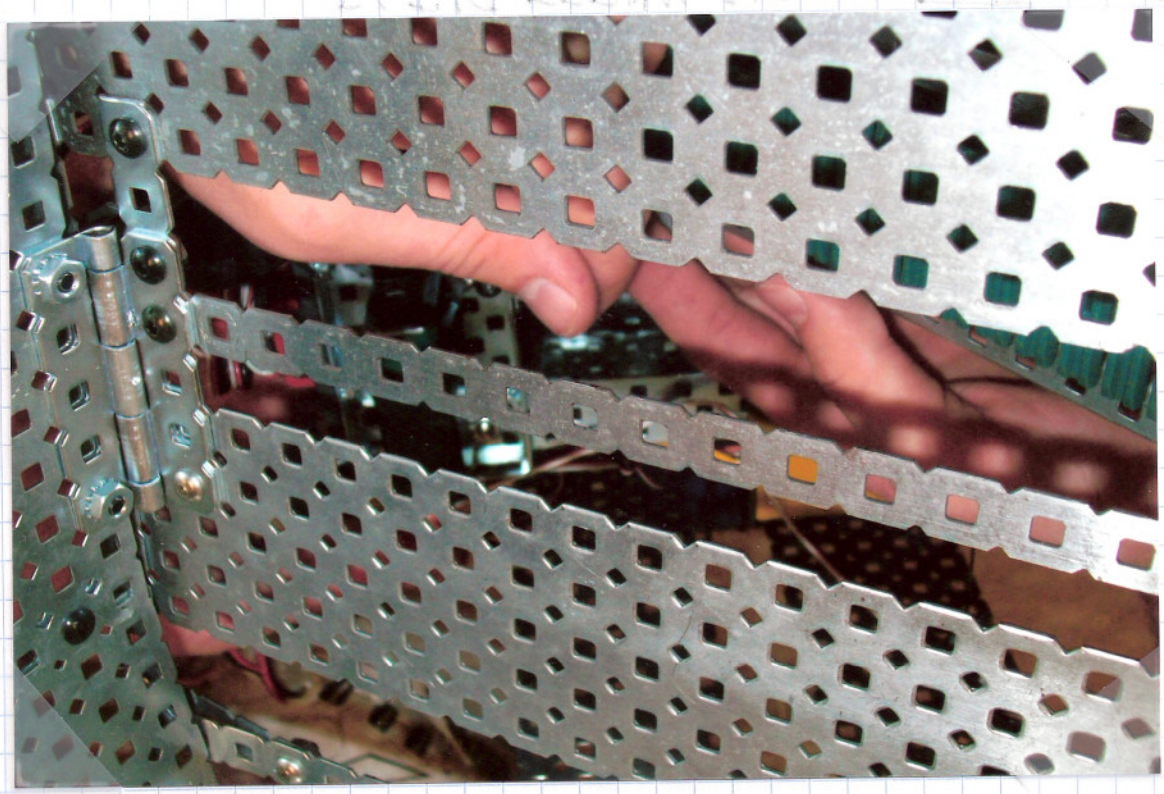
Note:

Credit for a four wheel drive robot must go to the St. Mary's Central High School robotics team. A demonstration at St. Joes Middle School opened our eyes to a better design process when it comes to driving a robot.

10 IDEA #5 COLLECTION BASKET







Explanation:

This Idea was created to collect balls directed upwards in the vertical tank treds. There is a hinge at the bottom of the basket connected to a rubber band and a motor. The motor pulls the hinge down and when the motor is released the rubberbands pull the hinge back to a closed position.

Why we chose this design?

- It allowed us to collect multiple balls and drop them at will.
- It can accomidate all three types of balls, Green, orange, and White

Why it wasn't used?

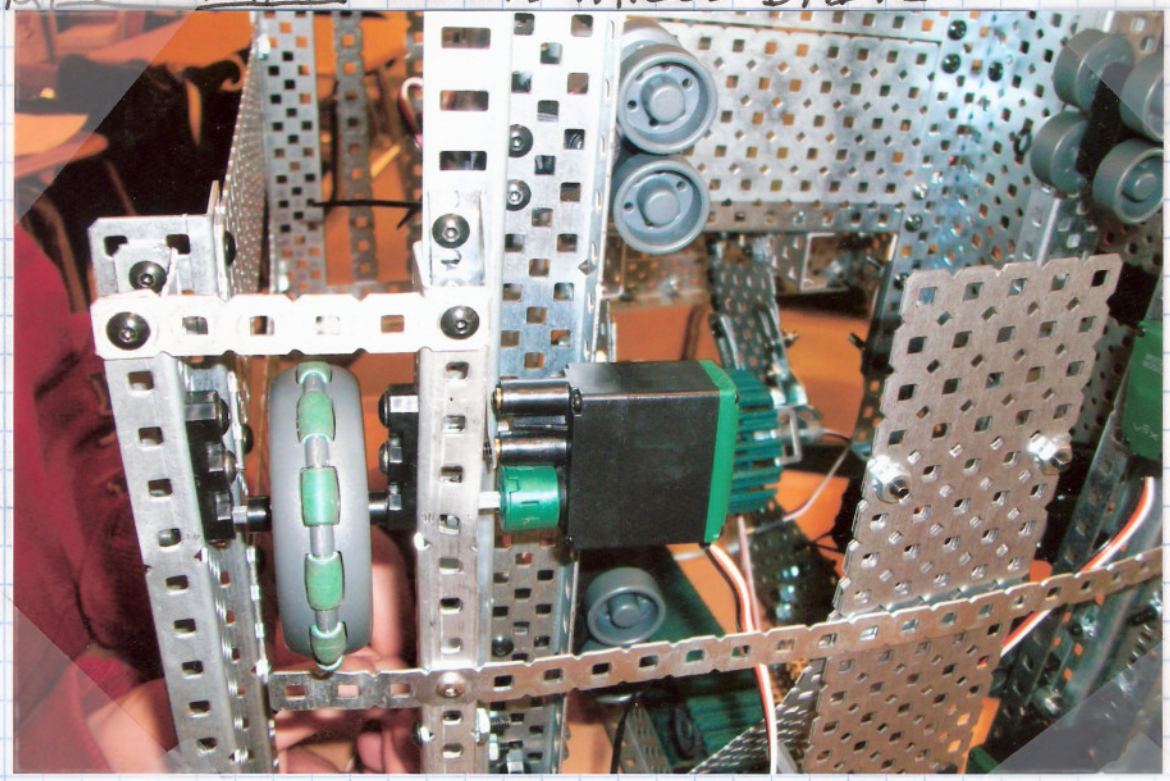
- Currently ~~in~~ use.

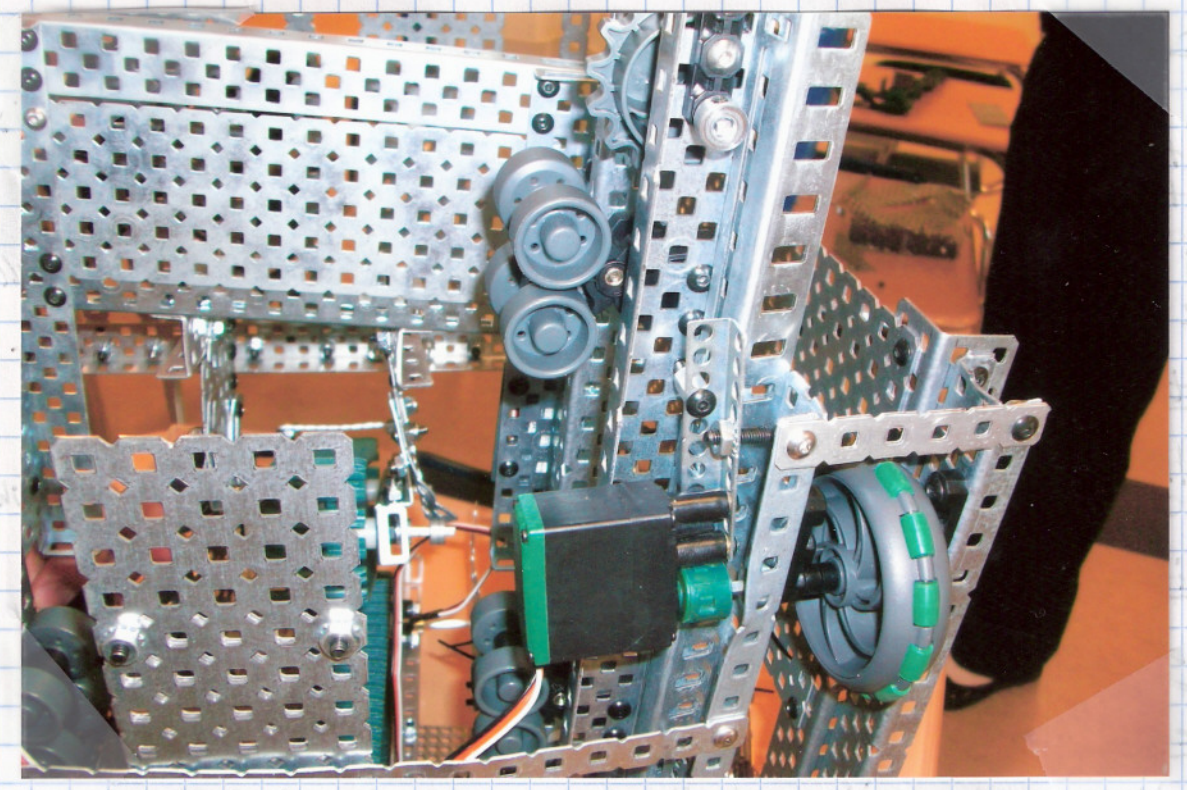
REVISED: Was only able to be preloaded
No additional balls could be added

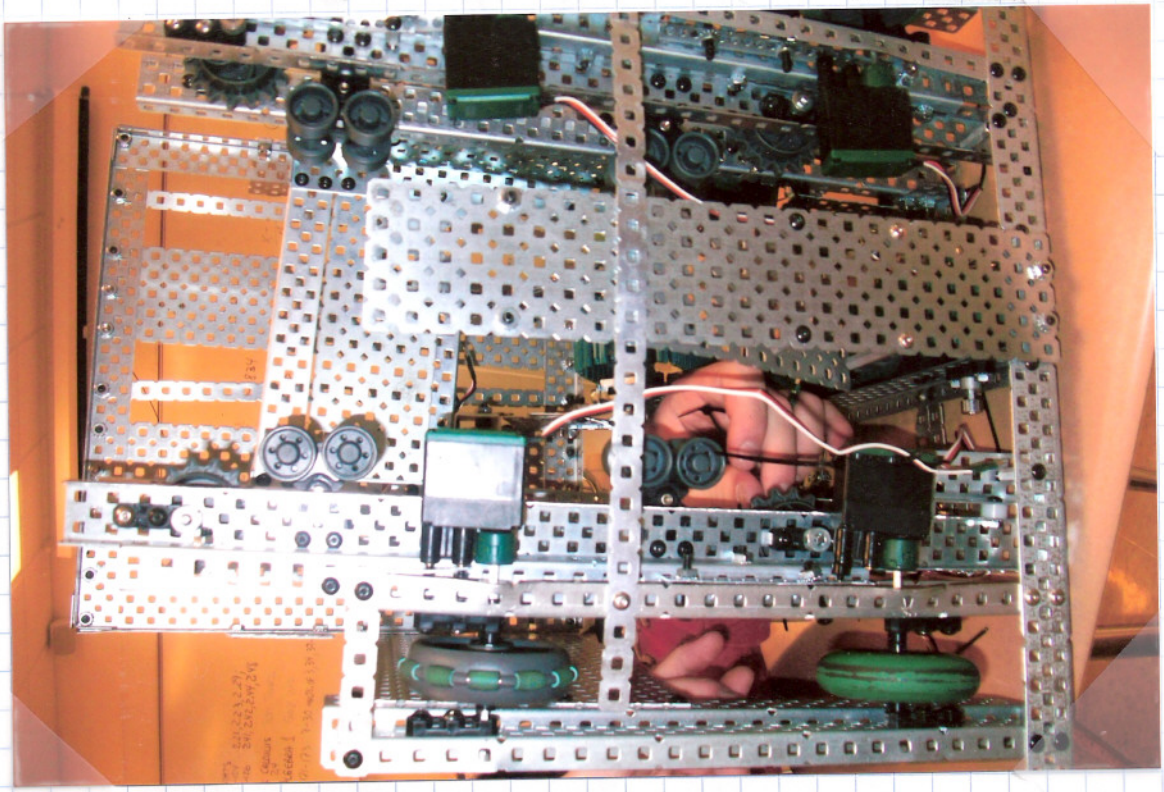
Problems

- It is difficult to redirect balls from vertical treds to basket.

IDEA #6 FOUR WHEEL DRIVE







Explination:

This idea was prompted by observations of St. Mary's Central robot from last year at a robotics demonstration for Lego League. St. Mary's Central and Xavier often meet and exchange ideas. This Idea only required attaching motors to the front two omni-directional wheels.

Why we chose this Idea?

- This idea allows our robot to turn much easier and faster
- Allows for more powerful driving.

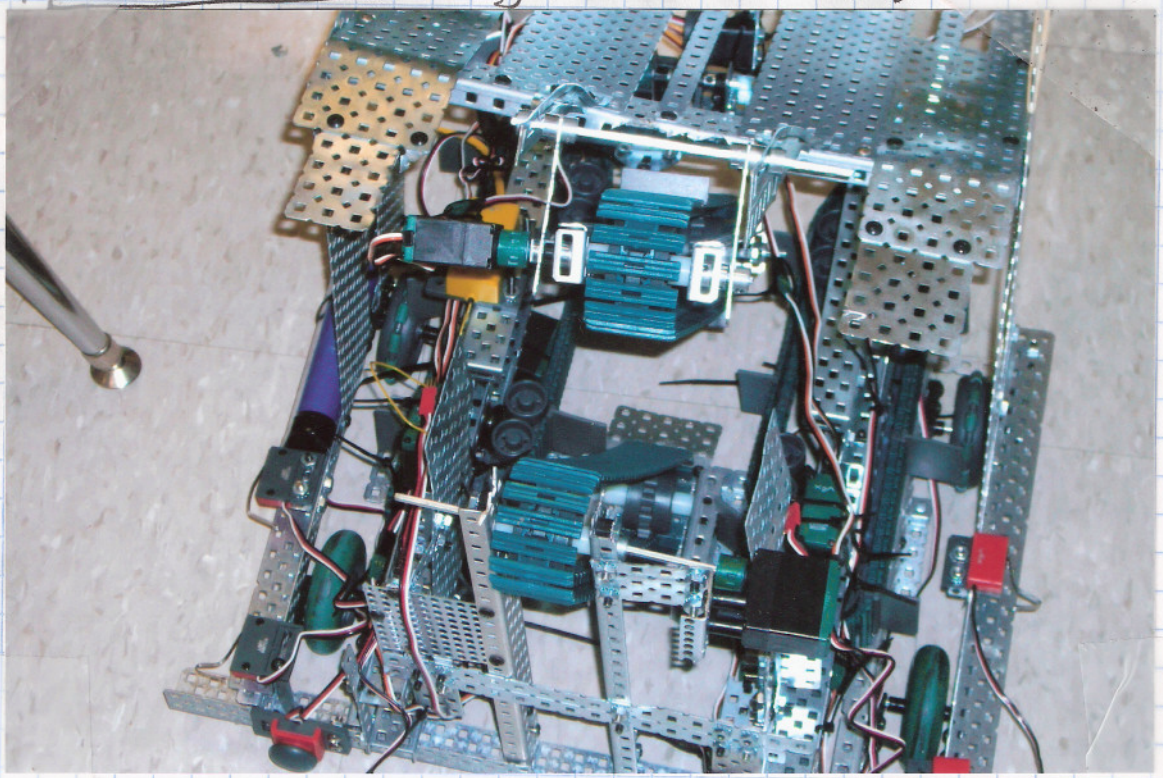
Why it wasn't used?

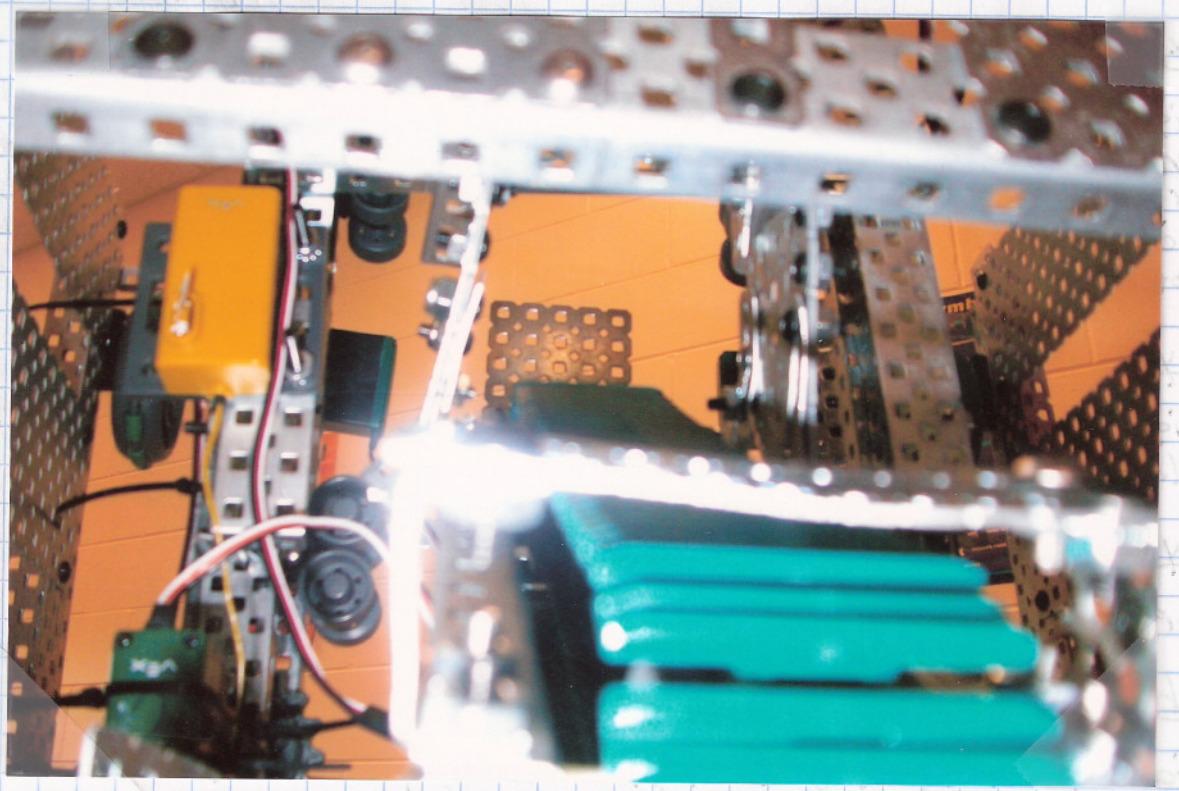
- Currently in use

Problems

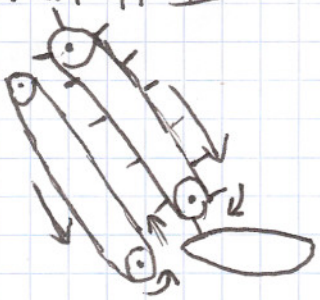
- slight turning and straight driving problems.

14. IDEA #7 Angled Vertical Treds

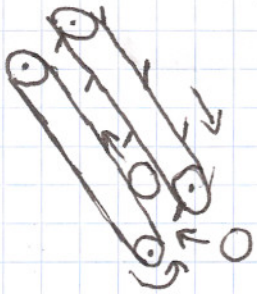




Sketch #1



Sketch #2



Explination:

This idea came about to negate the trouble of collecting orange balls. By angling the vertical treds, the nose of the ball isn't forced down too much and it is much easier to collect the orange balls. There was a slight problem with collecting green balls, for they were too small and didn't contact the upper tred. This was fixed with adding rubber protrutions ~~on~~ to the upper tred.

Why we chose this idea?

- It improved the collection of our robot to include orange balls.
- Efficiently collects two of three types of balls.

Why it wasn't used?

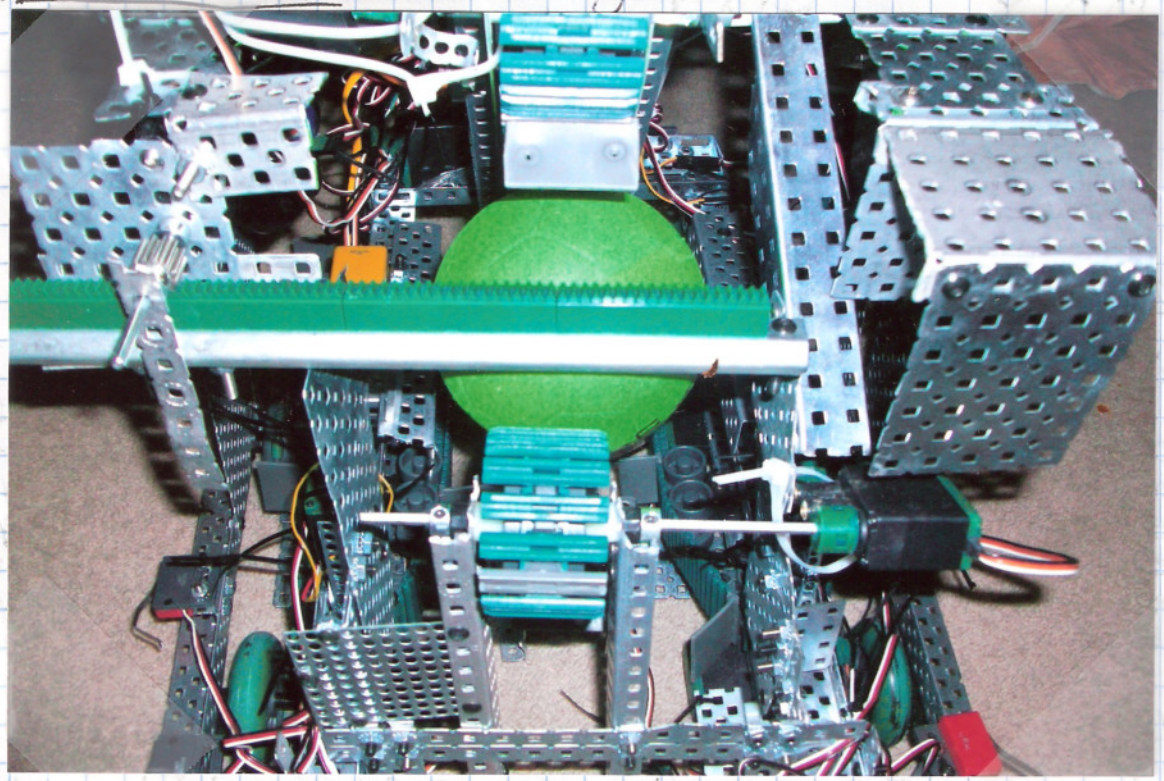
- ~~Currently~~ in use

REVISED: Was not able to collect orange balls. Jammed too easily.

Problems

- Very difficult to redirect balls into collection Basket
- Balls fall out the sides of Track.

16 IDEA #8 Movable gate



Explination:

This idea was created to help collect multiple balls without the already collected balls from falling out the back of our robot. This is accomplished by placing a movable baricade at the end of the treds so the balls can be dispenced at will. The only problem with this is that the balls fall out the side of the treds. This was simply fixed by building walls along the sides of the treds.

Why we chose this idea?

- It improved the number of balls able to be collected
- We are able to drop balls at will.

Why it wasn't used?

- ~~currently~~ in use

Revised: Not needed after treds were removed

Problems

- small problems with moving back and forth.

PRACTICE | Day 1 12/2/09

Before CHICAGO

Day 1 (12/2/09):

- Set up practice field
- Made small improvements on robot
- Watched Movies (Team Bonding)

Day 2 (12/3/09):

- Made adjustments on robot.
- a few practice runs
- Watched Movies

Day 3 (12/4/09) (All Nighter):

- Practice runs
- Small adjustments on robot
- Watched many movies

Before SMC

Day 1 (3/2/10)

- Practice with new robot
- Watched Movies

Day 2 (3/3/10)

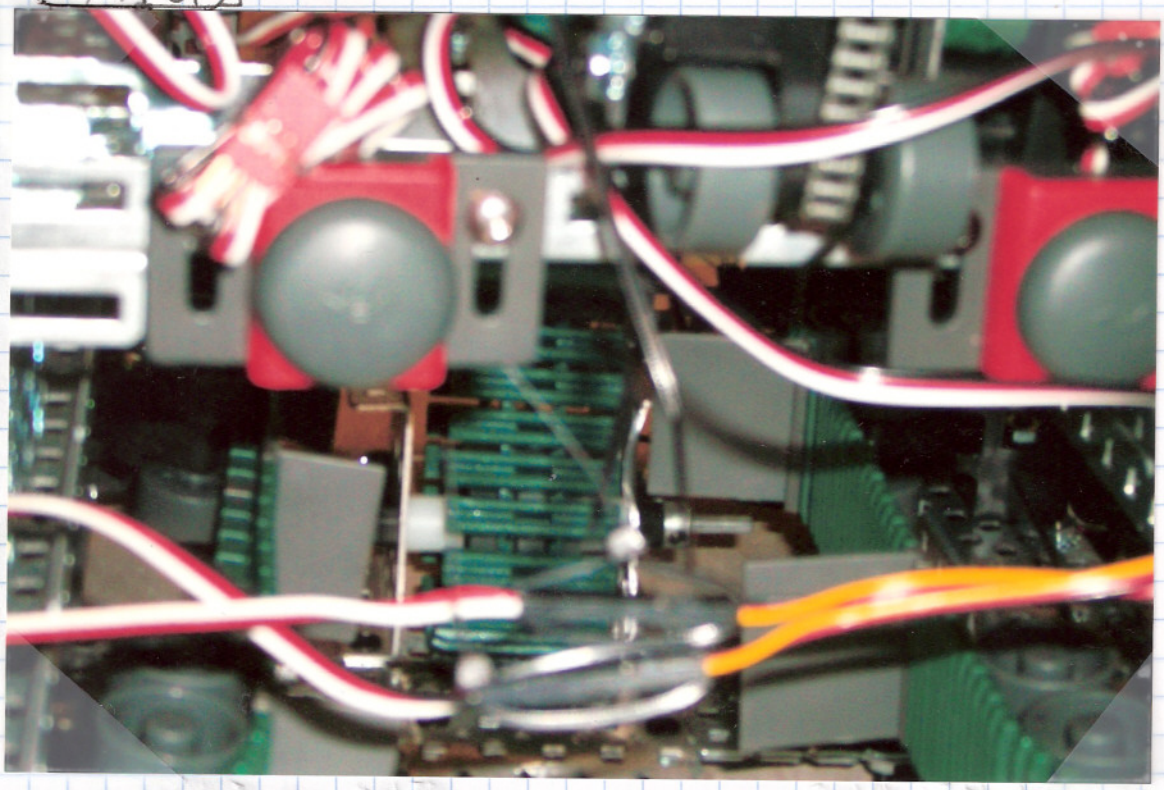
- Trouble Shoot and correct Problems
- Watched Movies

Day 3 (3/4/10)

- Counting Match Points
- Working out Strategy

Day 4 (3/5/10)

18 Extras



Explanation

Several bumper and limit switches were added to aid our programer, J-LO, in programing the autonimous mode.

Why we chose this idea?

- It allows J-LO to drive our robot along the wall.

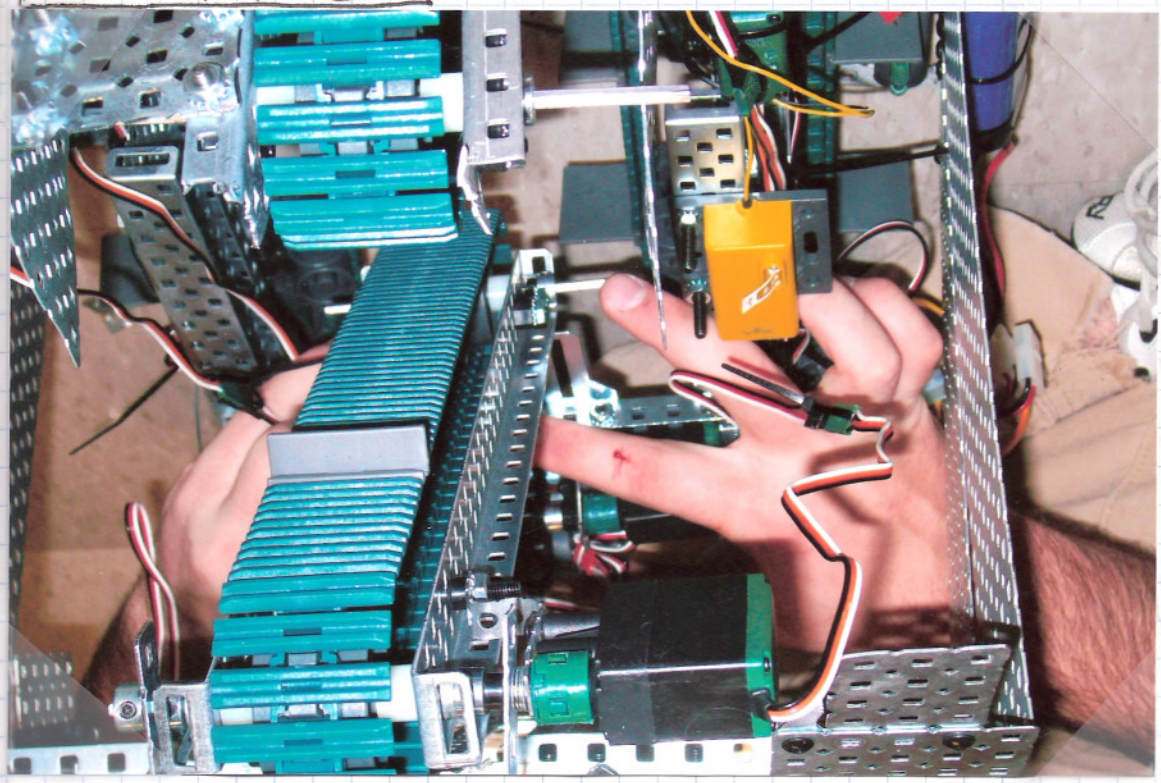
Why it wasn't used?

- Currently in use

Problems

- May push us outside our size requirement.

CASUALTIES



This page is to recognize all those brave enough to be in robotics. No one can participate in this sport without eventually "giving blood" to the robot.

It is an ongoing joke in robotics that you arn't a part of the team until some of your blood flows through the robot.

Robotics is a tough sport. Anyone strong, brave, and smart enough to participate is an extreemly valued part of the team.

20 STATEMENTS

Tyler: "I have been in robotics for three years and enjoyed them all. I have never seen a team with more potential to win."

Lucas: "This is my first year in Robotics and I love it. I've learned alot about how things work and why certain things wont work."

Rob: "Project done right... Like a boss"

Tyler: "Robotics is a lot of work but tons of fun."

Rob: "Butter"... "Like butta"

Lucas: "lots of practise... hardcore practice"

J-LO "Make an incision on the robot here."

Rob: "Circumcision..."

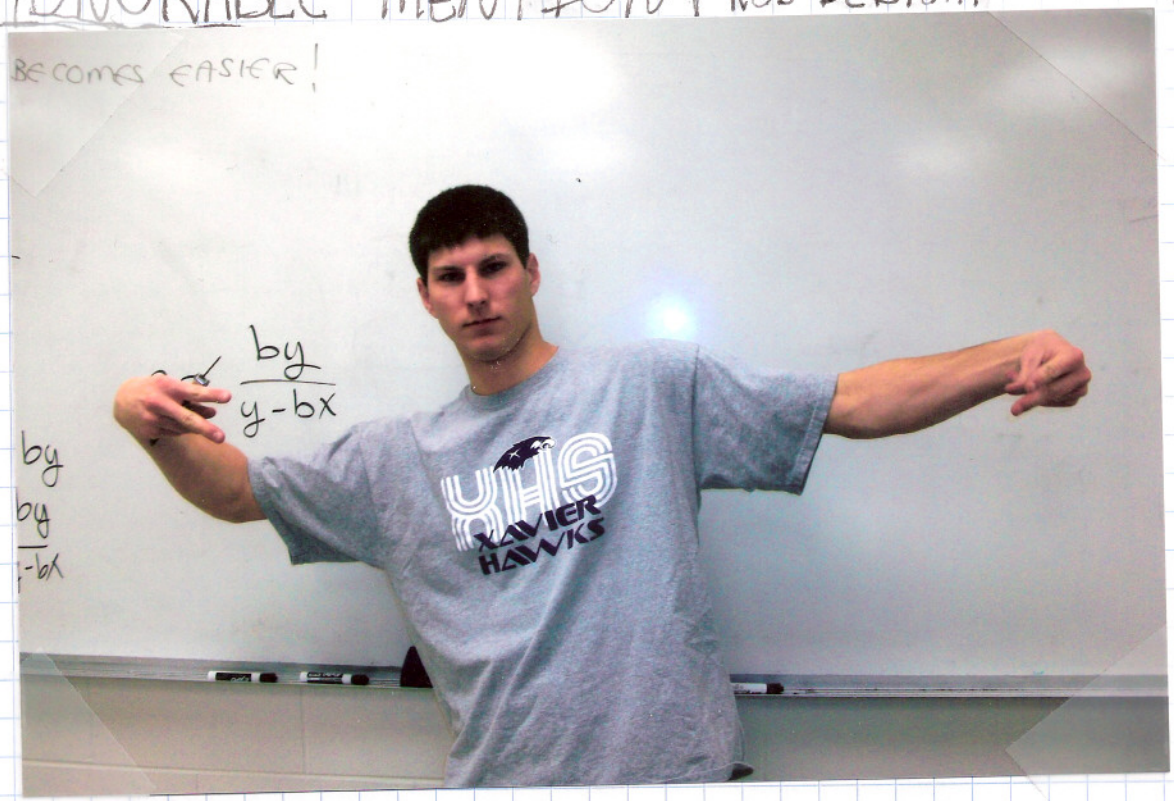
Tyler: "Go crawl in a hole and die."

Rob: "If you aint first... your last ~ Ricky Bobby"

Tyler: "If at first you fail, try again and show what you've learned"

Philip: I got great friends here.. And a great robot too..

HONORABLE MENTION | Rob DeBruin



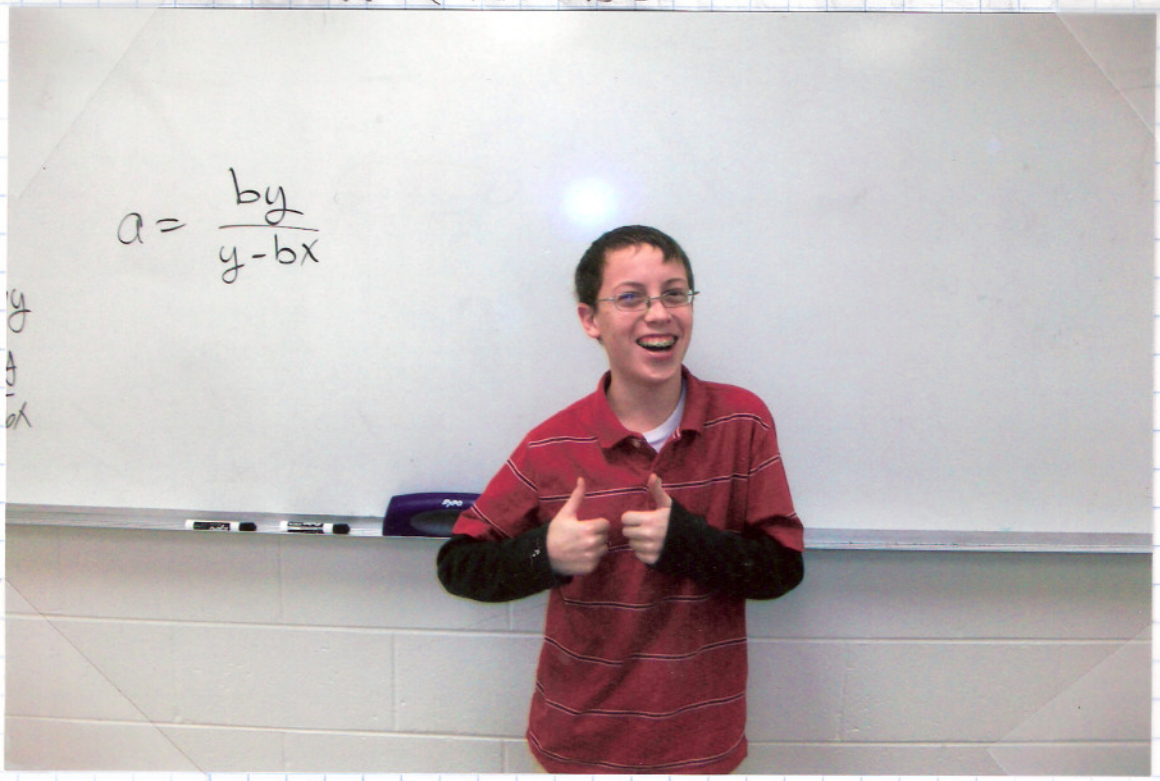
"Rob DeBruin has been my friend for four years, but has just this year joined robotics. He is brilliant. He should have joined years ago, but I am just glad he is on the team now." (Tyler Andryscezyk)

"Rob has been an immense boon to our team as a whole; his innate skill with mechanics has provided a unique viewpoint to the problems approached.

He's a total genius. That's why it is 'Rob'otics!

(Philip Kim)

22 Lucas Dvoracek



"The most dedicated freshman I have ever seen, Lucas has been a great friend, and teammate. I can't believe a freshman could work so hard." (Tyler Andryszczyk)

"Lucas is a talented and awesome freshman to work with. This is my first year of robotics but if I had known I would meet great new people like him I would have joined alot earlier." (Rob DeBruin)

- Hardworking equipped with good ideas, Lucas contributed to our robot greatly. (Philip Kim)

Tyler Andryszczyk

by
t-bx

"Tyler is the most single asset to our team. He has been my friend for the past 4 years and shows more dedication to the club than anyone I know. He's fair and an awesome team leader to work for." (Rob DeBruin)

"Tyler is a great teacher and helps me know what to do. He accepts all ideas and tryes to include everyones Ideas." (Thomas Dunwell)

Tyler has every quality that Robotics members should have. Intelligence, willingness to accept different ideas, and 3-year-experience.
(Philip Kim)

J-LO

"J-LO has been my friend forever. We are tight. He is an extremely needed member of the team. Without him we have nothing." (Tyler Andryszczyk)

"J-LO is soo much fun to work with in Robotics. He is the best/only programmer for our group and we couldnt do much without him." (Rob DeBruin)

J-Lo is talented programmer. It is hard to imagine Robotics without him
(Philip Kim)

Philip

"Philip, my host bro, is one of my best friends. He is supriosingly involved for just coming to America. He is a good guy and great friend." (Tyler Andryszczyk)

"Philip is an awesome teammate, he knows how to have fun & works hard when the project needs to get done. He joined a little late but he's just as much of a member as anyone. P.S. He's awesome with the ladies! woot Philip!" (Rob Desruisseau)

26 The Chicago Tournament

We went into the Chicago Tournament quite ambitious and a little bit naive. Once there, we saw that we were outmatched. Unfortunately, we took eleventh out of twelve. Good did come from this, however, considering that we realized we were much too slow and our collection system required us to be excessively exact.

After this disappointing loss, we returned to Appleton, determined to redeem ourselves.

What we can take from this:

"If at first you try and fail, try again and show everyone what you have learned."

(Tyler Andryszczyk)

Building A New Robot

The Idea of the Basket

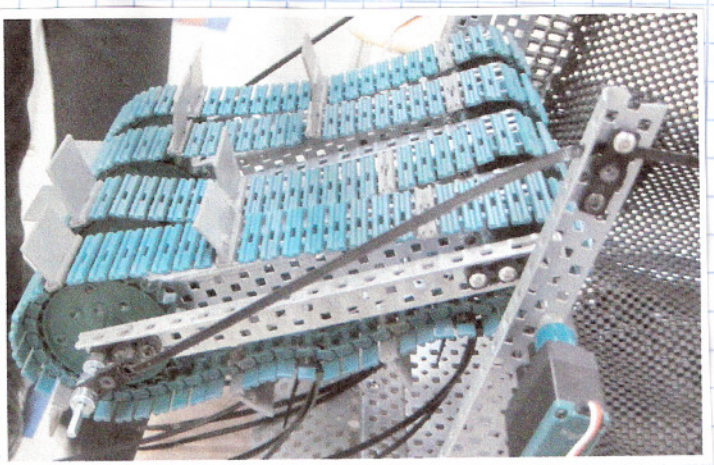
Explanation:
Our old robot could only hold one orange ball at a time. This was very inefficient and needed to be fixed. The idea of the basket would allow us to collect many balls and be able to dump them very quickly. The trouble with this was that the basket could get quite heavy and tough to lift.

Why we chose this design?
It provided an easy solution to our lack of collection.

Why it wasn't used?
It is currently being used.

Problems
The hole created by the collecter caused a problem when the balls are being dumped. When the balls were getting dumped, they would fall out of the hole needed to accomodate the collecter.

Collection Tredd



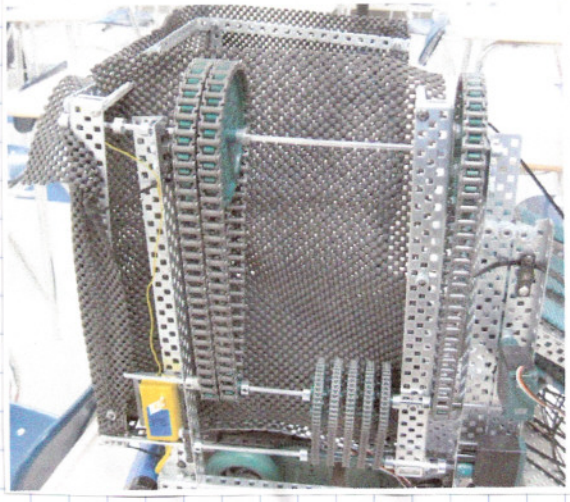
Explanation:
The idea of this contraption was to roll the balls into the basket via motorized tank tredd with rubber extensions to collect the green balls. A flow system was employed to allow the ability of both sized balls to be collected.

Why we chose this design?
Rob proposed that we use this design because it used gravity to descend to the proper height to collect the green balls yet also had the ability to be risen without a motor when needing to collect orange balls. It provided an extremely quick way of collecting balls of different sizes.

Why it wasn't used?
A quicker, more versatile and less precise method was found to collect not only two, but ALL three sizes.

Problems
This design often jammed when collecting orange balls if the ball was misplaced, even a fraction of an inch.

Lifting the Basket



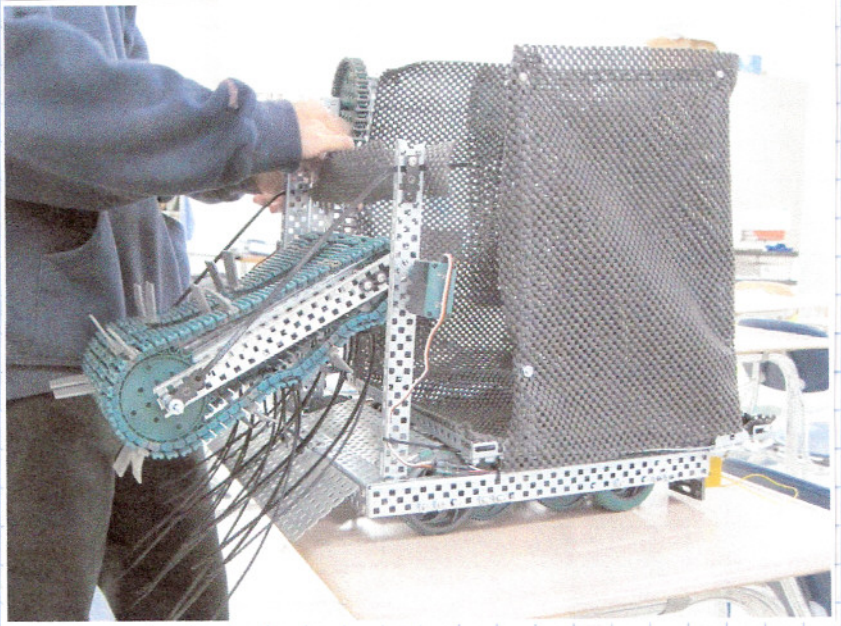
Explanation:
The basket was in place, but the decision was how to empty it. The balls couldn't be unloaded off the back because the extension of the basket would be hampered by the collection mechanism. Therefore, we opted to dump off the side of the robot. Chain drive was the first method employed. We ran an eight tooth gear of low strength was ran to another sixty-four tooth gear of low strength. Four more of this design was added to make up for the low strength gears. Then, the axle driven by these gears was attached to an eight tooth gear of high strength ran to a sixty-four tooth gear of high strength.

Why we chose this design?
It effectively tipped the basket with a great number of balls contained inside.

Why it wasn't used?
The basket became too heavy and tore through the plastic gears. A stronger method needed to be found.

Problems
The bucket dumped much too slow and competitors had large amounts of time to block our attempts to dump balls.

Improving the Treds



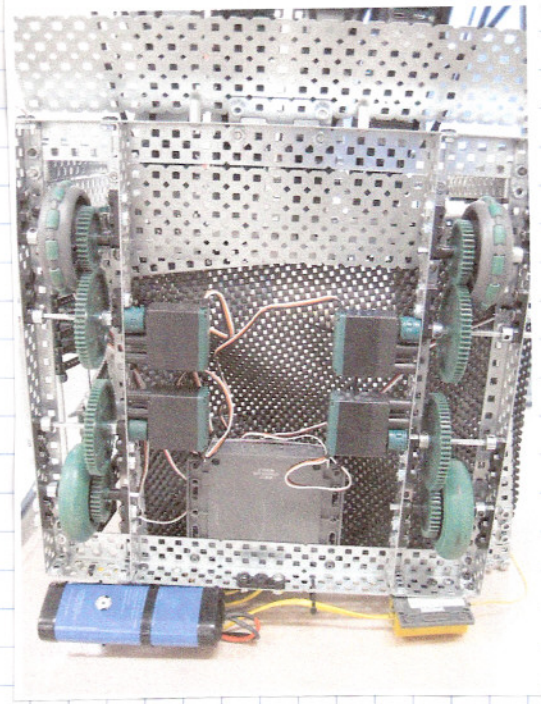
Explanation:
Zip ties were added to the treds to extend the distance we could collect and also to help push balls to the back of the basket.

Why we chose this design?
It was a quick and easy fix.

Why it wasn't used?
It was removed when the treds were removed.

Problems
It jammed balls much easier. It also weakened the power output from the motors.

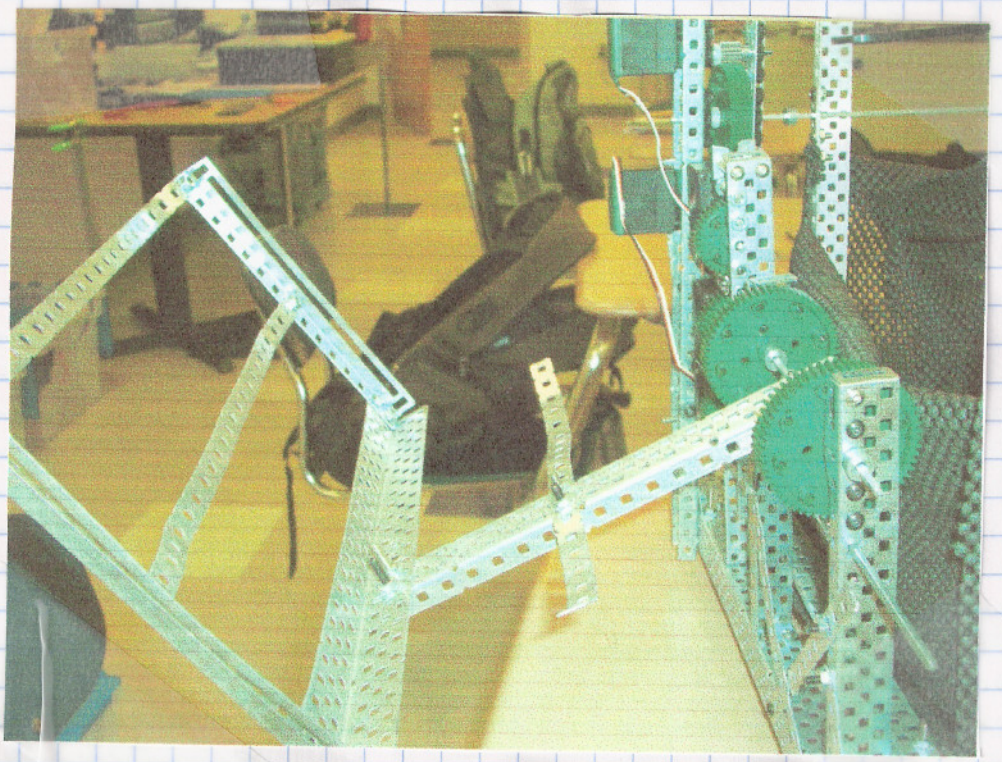
Keeping A Good Idea

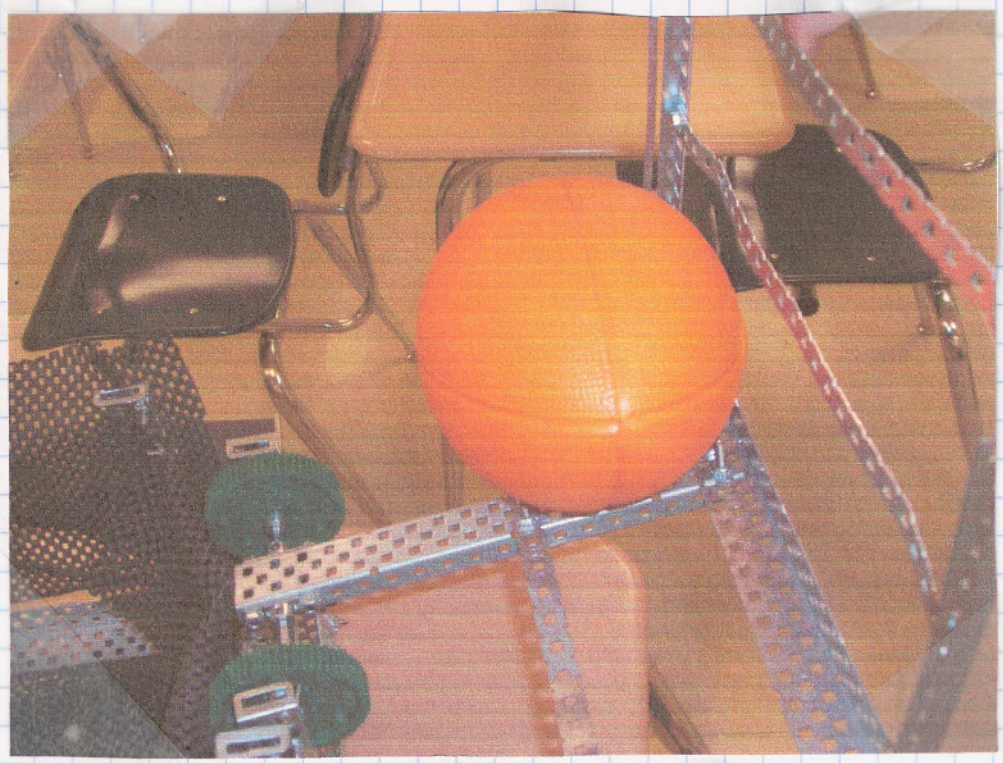


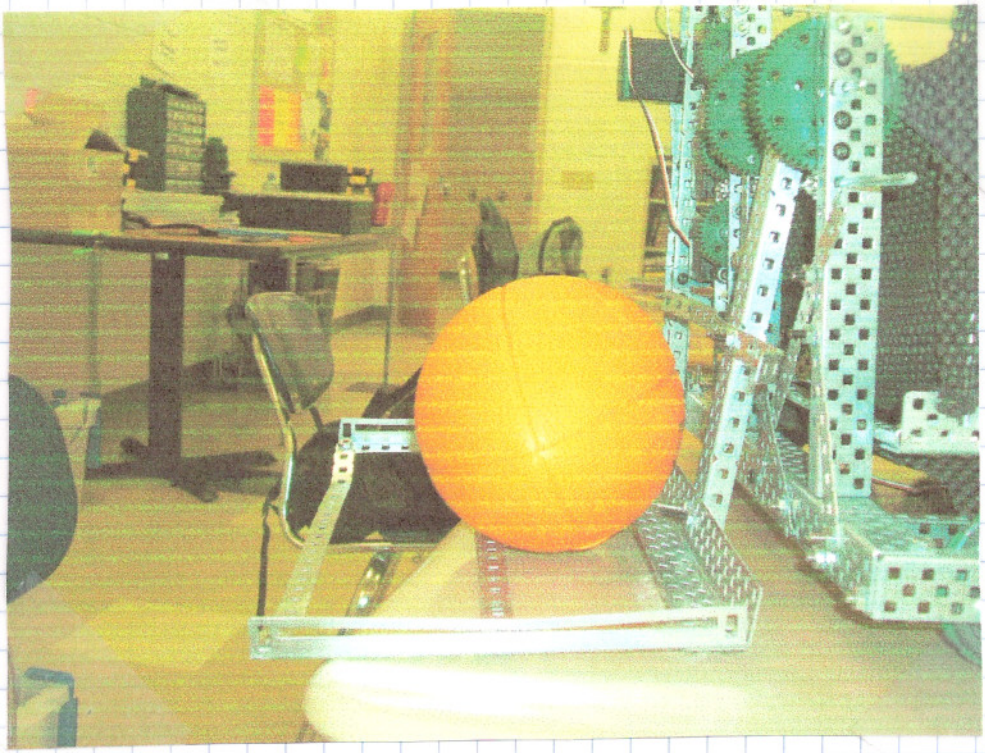
Explanation:
The placement and functionality of our wheels were acceptable in the Chicago Tournament. So we opted to keep the design.

Why we chose this design?
It worked well in Chicago.

A New Collector







Explanation:
The old collection system needed to be too precise, so we borrowed a design of scooping from our fellow Xavier team 536B. This allowed for easier collection.

Why we chose this design:

- This Idea allowed for less precise collection, as well as the ability to collect up to 6 green balls at once, or 2 orange balls at a time. It also handled the white ball if dropped.

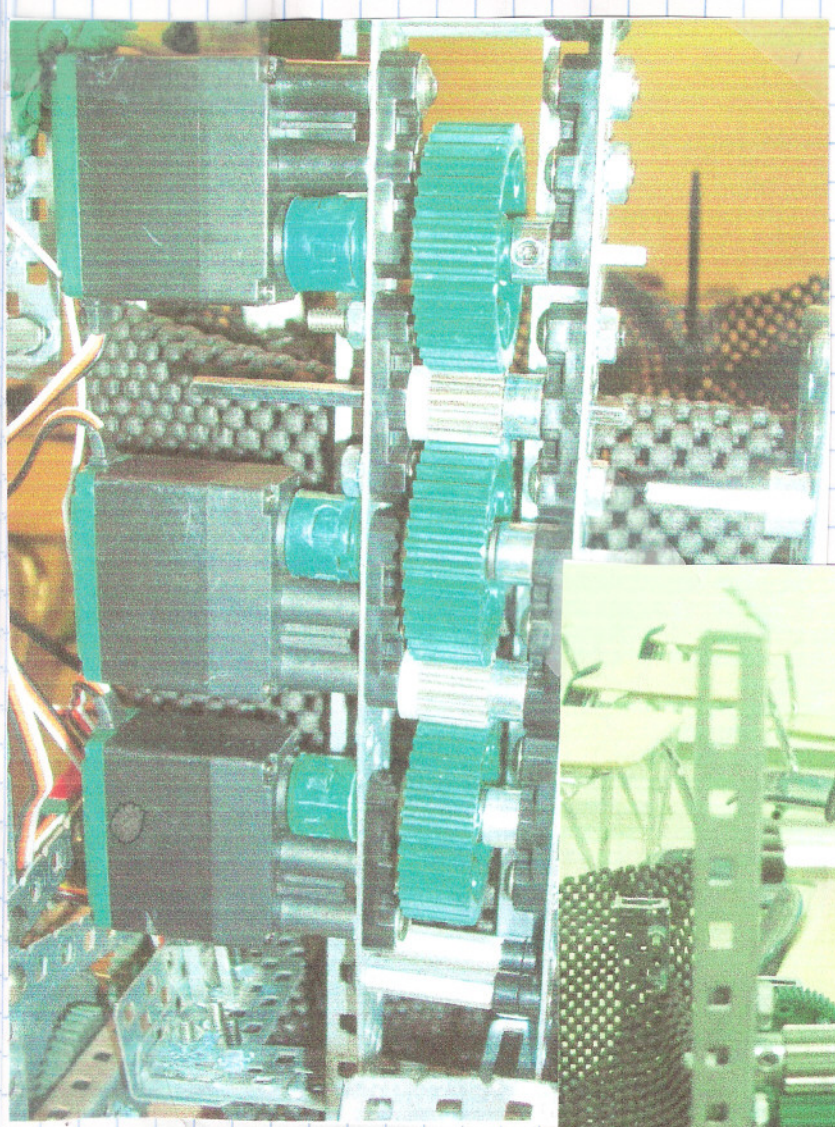
Why it wasn't used:

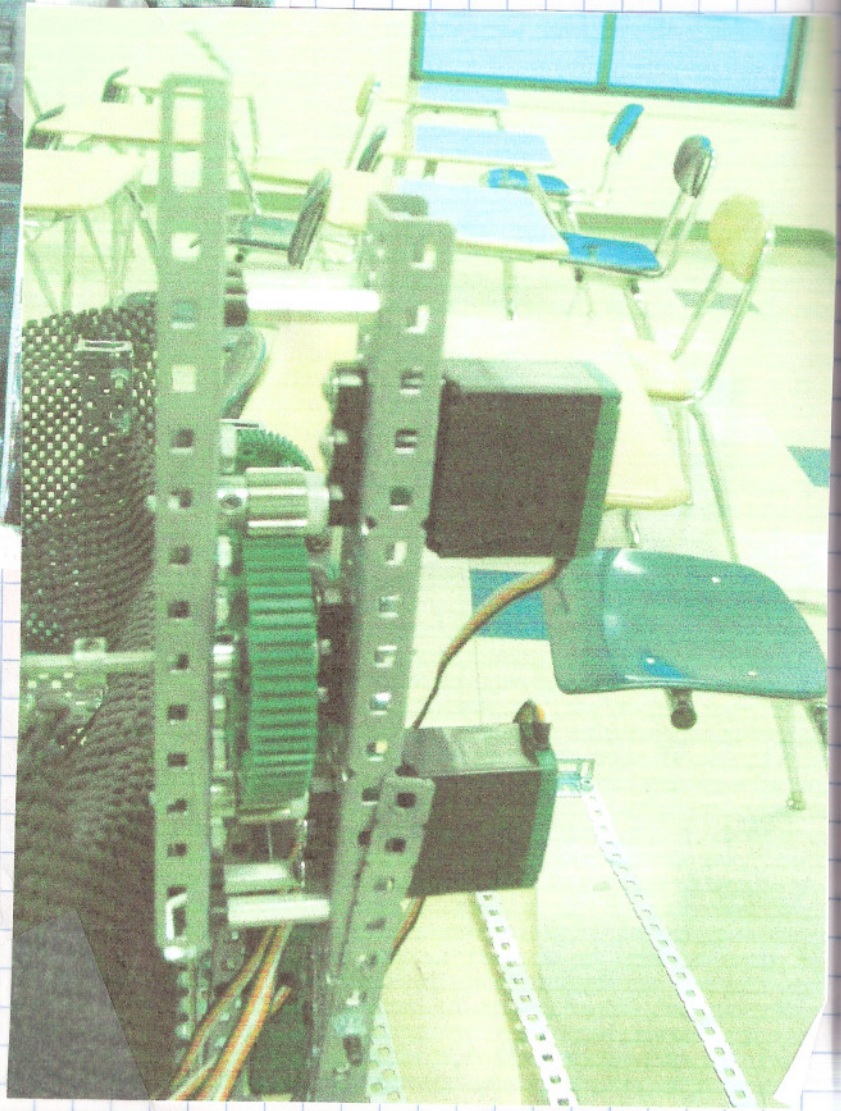
- This idea is currently in use.

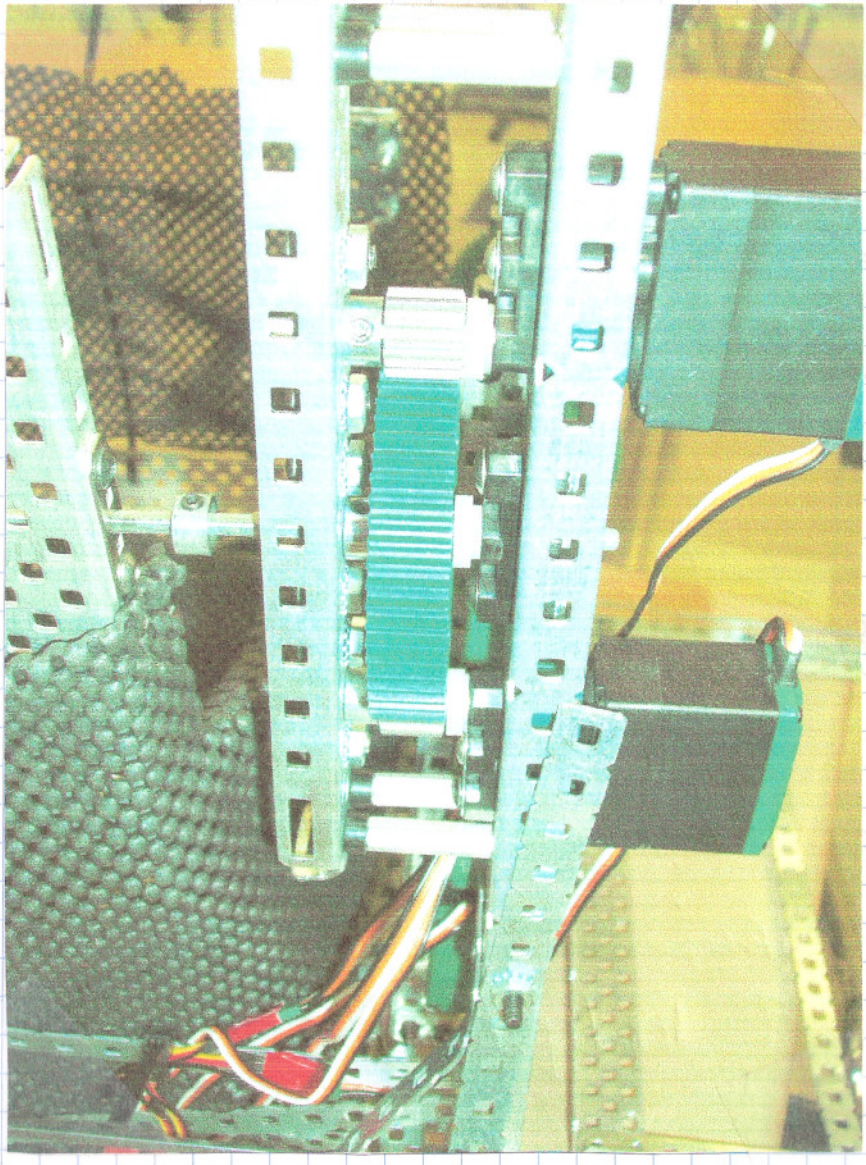
Problems

- This Idea seemed to struggle when gear ratio came into account. It seemed to struggle lifting orange or white balls at the speed we needed.

An Anomily: Fast and Powerful!!







Explaination:

This Idea solved all problems of speed vs. power. It combines the power of two motors with a fast gear ratio.

Why we chose this design?

It improved speed and power of both collector and dumper. It is extremely solid and beyond all abilities of single motors.

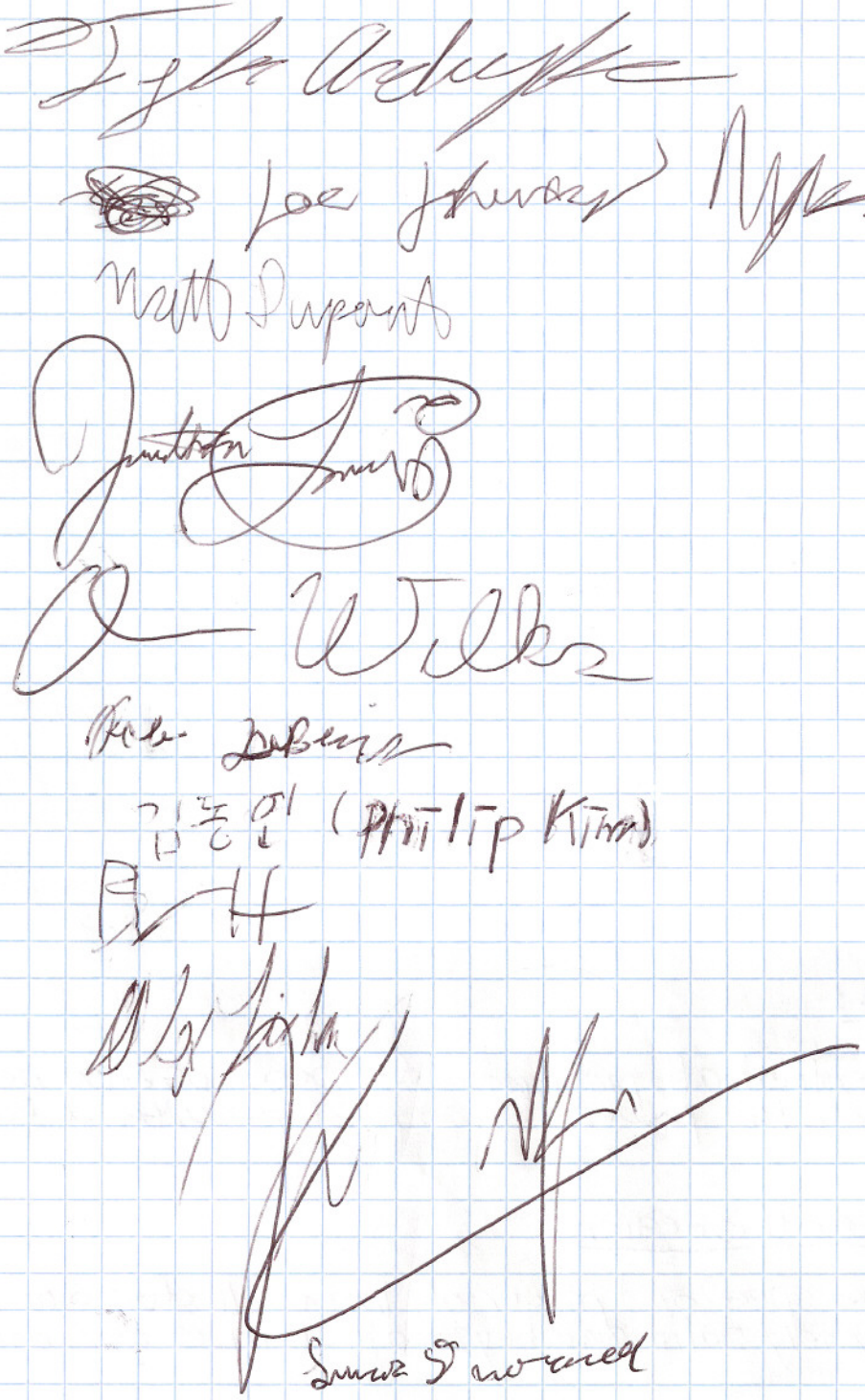
Why it wasn't used?

- This idea is currently in use

Problems

- Any problem takes large amounts of time to fix.

3/2 The Night Before: Attendance Log



- Hosted at Tyler's House
- 10 xavier kids showed up and at least one member from each XHS team came to practice with their robot

Often artistic skills were expressed in strange ways late at night