



Recycle Bot

Trash Picker

97101W

Aditi Bhavsar, Rishita Dhalbisoi,
Grace Zhen





Purpose

When we were brainstorming ideas for this challenge, we decided to focus on the very core of what this challenge was meant to inspire. To us, it meant being creative, and the best way we could do that was by giving a new meaning to the challenge: reusing materials to create an object that would help decrease the amount of waste we produce. These days, we produce (literally) tons of waste; practically every package we order- or even the food we buy- comes with layers upon layers of packaging. To top it off, this packaging comes with the burden of environmentally harmful waste. To reduce the impact of this municipal waste, why not take these same excess materials and convert them into an object that will pick up litter and help keep our planet safe? To put it simply, the purpose of the trash picker is to help keep the environment clean. Admittedly, the same thing can be done by people using gloves and physically picking up trash. However, this "recycle-bot" adds another layer of protection that is helpful especially during the COVID-19 pandemic, since the more distance and sanitation we have, the better.



Materials

- String
- Straws
- Gift wrap rolls
- Hot glue
- Tape
- Staples
- Cardboard
- X-acto knife
- Metal soda can





Prototyping

- We built the prototype to create rough estimates of how much material we would need and what shapes would potentially work for our real model
- We started off with our really worn down cardboard pieces from a delivery box from one of our teammates
 - We cut the cardboard in half and it was around 25 in long. Then the piece of cardboard was used as the rod of the design, serving as a connection from the user's hands to the ground.
 - We discovered that the makeshift rod was short and barely reached the ground and we resorted to using a long gift wrap cardboard roll one of our teammates had. Additionally, we opted for the roll as we found the cylinder to function smoother than a cardboard box that was bent in contorted ways.



Prototyping

- Then we cut a couple differently sized rectangular pieces to form the base that the fingers were stuck to; the larger rectangles were bent at three parts to act as a "clamp" which did not work well.
- We then decided to try attaching bent "fingers" onto the smaller rectangular cardboard pieces.
 - We cut thin strips of cardboard with varying width and heights to test what the most effective at "grasping" and holding on to trash—we set the "control" for our trash as a standard Coca-Cola metal can.
 - We found out that our 6 in x 1.5 in sized fingers worked well when attached to strings because it was not long enough to clash against fingers on the other side,



Prototyping

- but it wasn't small enough that it couldn't pick anything up.
- We also created an "arm brace" to make it more convenient for the user to hold onto the rod and thus, more convenient to use.



Construction

- Step 1: We cut out 7 small cardboard rectangles with an x-acto knife for the finger parts. We then folded them into 3 parts each.
- Step 2: We cut 21 straw pieces of the same size, 3 for each finger (or one for each folded part), and stuck one piece between each fold on each finger using hot glue, to create the hand.
- Step 3: We cut out two more cardboard rectangles, and used hot glue and staples to group the fingers to these rectangles. 4 fingers on one rectangle, and 3 on the other, so that the fingers alternate.



Construction

- Step 4: We then utilized a gift wrapping paper roll as the base.
- Step 5: We attached the 2 hands with a small toilet paper roll with a hole in the middle, in between the 2 hands.
- Step 6: We attached a string at the top of each finger, through all the straw pieces on the finger, so that the finger can bend when the string is pulled. We did this for every finger, one string for every finger.



Construction

- Step 7: We tied the strings from all the fingers, from each side, together. One bundle for the strings from the fingers on the left hand, and one bundle for the other.
- Step 8: The longer toilet paper roll was attached to the hand.
- Step 9: The two bundles of string were pulled in through the toilet paper rolls.



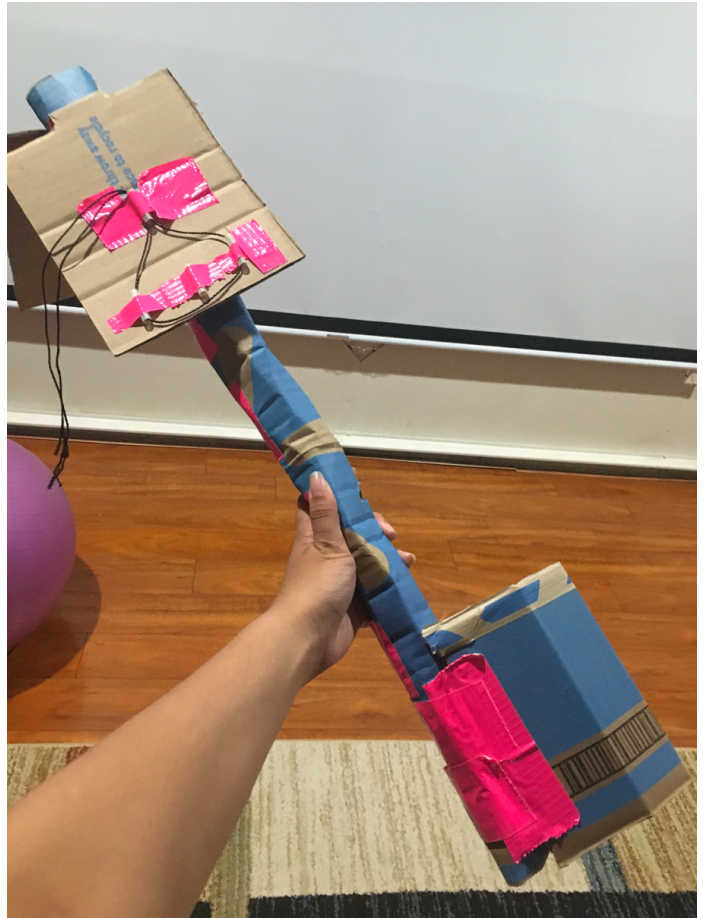
Challenges

At times, the strings weren't bending properly. They were sometimes irregular, and a few strings were pulled more than others. We fixed this issue by creating a handle that combined all the strings. In addition, some of the fingers and parts fell off because the hot glue did not act as an effective adhesive. We fixed this problem by getting better hot glue sticks and properly using the hot glue gun. Furthermore, we used a mixture of glue and tape in certain parts for extra strength.



Prototype

Gallery



Picker upper
in motion
(curling
claw)

