



MASSACHUSETTS INSTITUTE OF TECHNOLOGY



RHODE ISLAND SCHOOL OF DESIGN

Team 9: Transporting Therapeutic Materials

Assignment #5 for 15.783

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Michael Boren
Shivani Garg
Gaurav Kewlini
Jack Milwid
Emily Vernon
Adam Weinstein

Mission Statement

Transpeutics aspires to dramatically improve the delivery of therapies to developing nations efficiently and effectively, with the goal of saving millions of lives.

Content

1. Product Concept Presentation
2. Description and Sketch of Concept
3. Process and Results

Product Concept Presentation

See attached powerpoint.

Product Concept and Description

We at Transpeutics have decided to re-design the standard vaccine carrier to enhance the function of the carrier without significantly affecting the over-all cost. Our vaccine carrier has the following novel features:

▪ Single Vial Dispensing Mechanism

We identified temperature regulation as one of the key customer needs for a new vaccine carrier design. We uncovered in our field research that frequent opening of the vaccine carrier (often in open and sunny spaces) can lead to an increase in temperature that renders the vaccine impotent. The mechanism we designed is easy to use, saves time, and also controls the temperature within the carrier. The vials are organized spatially and are distributed evenly between the ice packs, thus preventing freezing/warming of the vaccines.

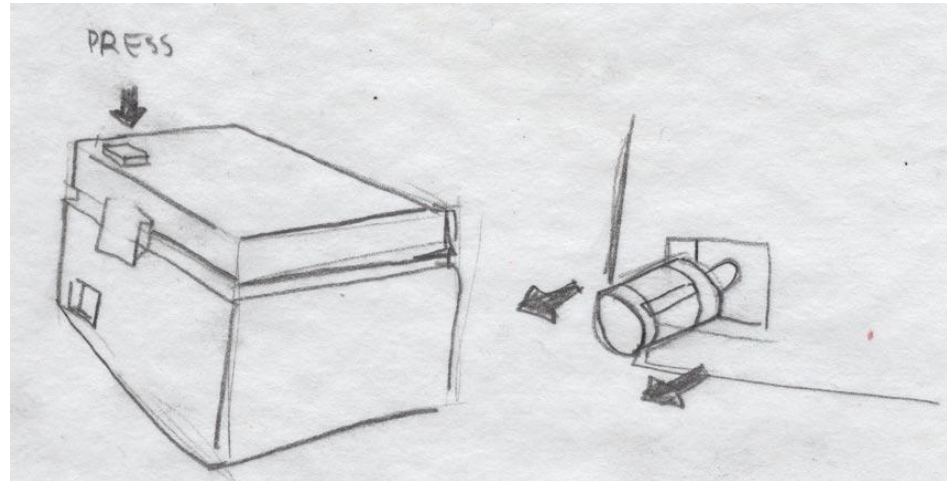
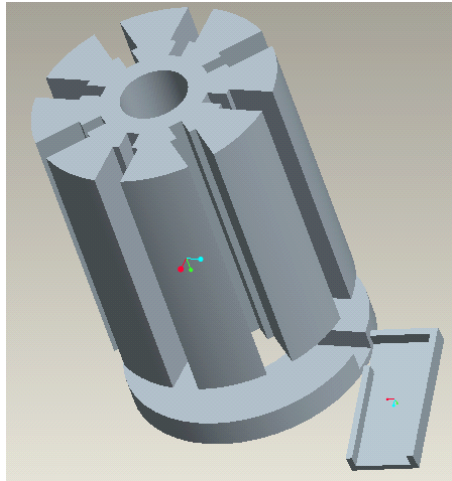
▪ Temperature Display, Logger and Warning System

We identified temperature tracking as another key customer need for a new vaccine carrier design. We have developed a novel temperature tracking and logging device that will not only relay real-time temperature information to the user, but will also log the temperature such that retrospective analysis can be conducted to better uncover failures in the cold chain. A visual and audible warning system has been incorporated to indicate to the user if the temperature is crossing the standard WHO limits. A logger is also provided to continuously record the temperature changes during the vaccine delivery in the cold chain process.

▪ Adaptive Straps and Modular Packing

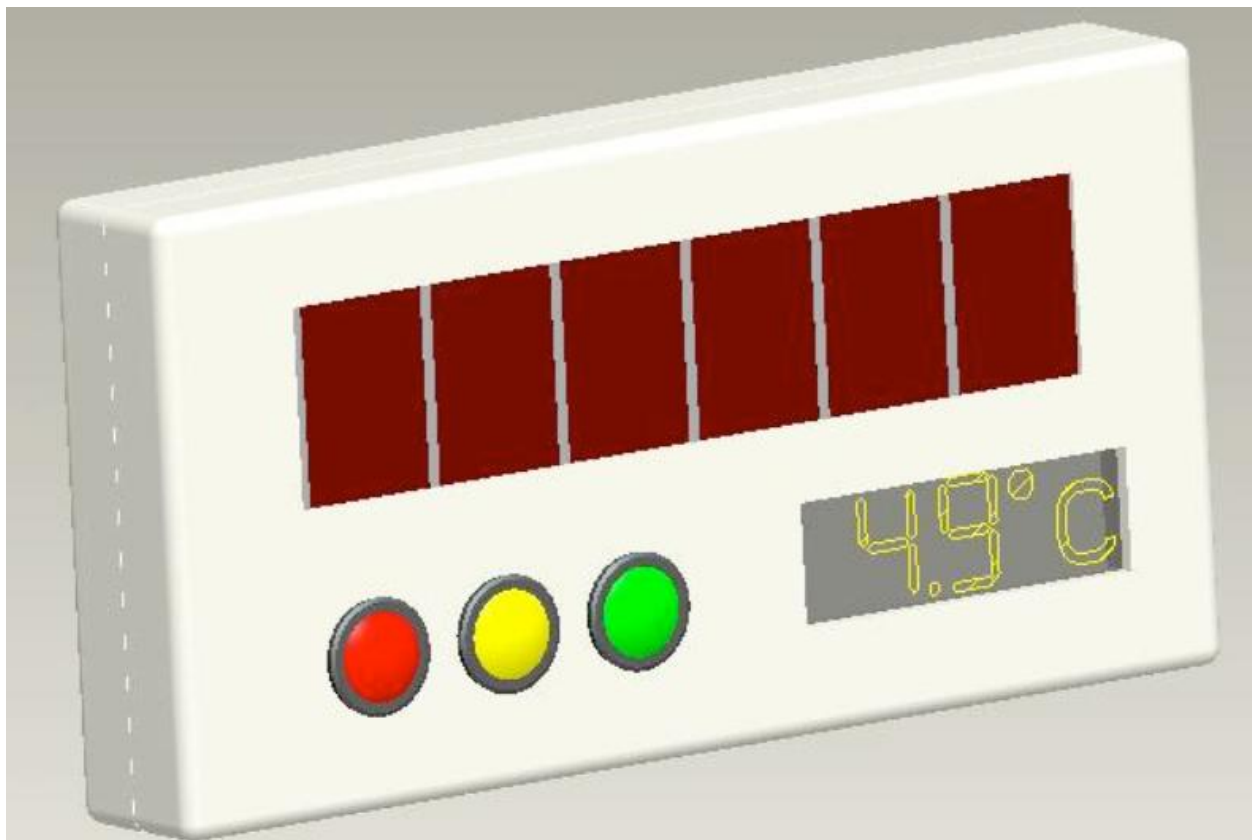
Finally, we identified modularity as a key customer need for vaccine carriers because of the diversity of applications of the carriers in the field. Modular packing is used so that multiple carriers can be stacked together. Additional containers (for carrying other medical supplies or for vaccine disposal) can also be attached to the carrier via this mechanism. Adaptive straps allow the user to carry the vaccine box on the shoulder or to secure the carrier to a vehicle.

Single Vial Dispensing Mechanism: Rotating barrel dispenser



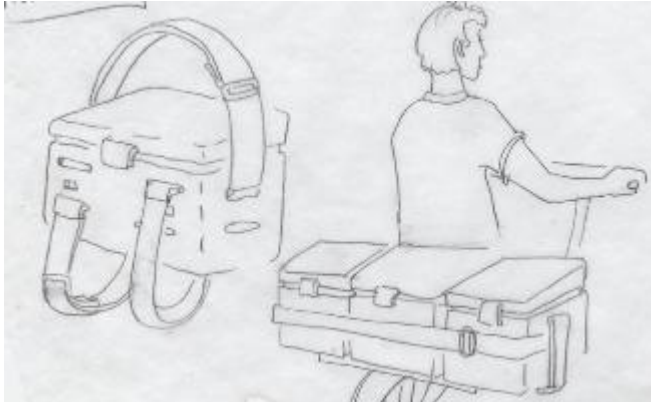
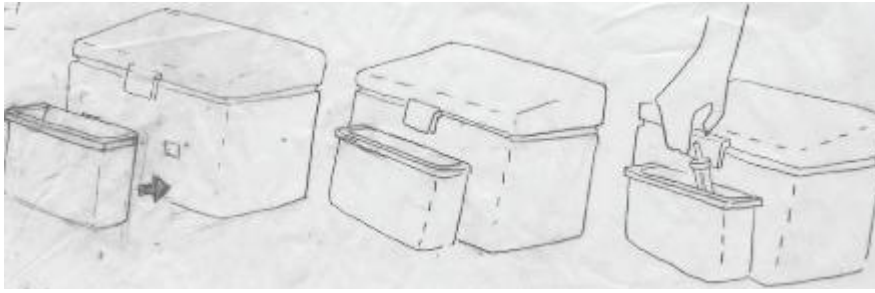
Vials are stacked in columns that can be rotated to dispense individual vials as needed. Different columns can store different vaccines, depending on the user's needs.

Temperature Display, Logger and Warning System



Features an LC read-out display of the temperature, LEDs that show the status of the temperature as a color read-out, and a small solar panel (plus back-up rechargeable battery) for power.

Adaptive Straps and Modular Packing



These design features will enable the user to carry vaccines in a variety of different ways depending on the conditions of use.

Process and Results

We met and discussed the information we had to date on the problem space as well the different solution options that we had identified. Each team member presented their favorite solution and “pitched” it, and the group listed the positives and minuses. We decided to focus on two problems: improving the cold storage box and improving the information available to aid workers to detect temperature problems. Going forward, we have decided that two sub-groups will tackle each problem, but we will still coordinate in our weekly meetings.

We met over the weekend as a team and created the initial model/prototype for the presentation, as well as gathering supplies from Home Depot. Also, we have been in contact with a doctor from Nigeria and Design the Matters.