Effortless Palate Expanders

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The purpose of this experiment is to create a palate expander that is significantly easier to use than your standard RPE model. Palate expanders are necessary for children in early stages of puberty, who have an improperly shaped palate which can cause breathing issues and make getting braces difficult. Current palate expanders, RPE and Quad Helix, either require long amounts of time to get results or are incredibly difficult to actuate by the individual. Our constraints included safe expansion, accurate movement, and easy use. Our initial Prototype "V1" was a rack and pinion based system that , using a central gear and two racks, moves linear gears upon input from the circular gear, expanding 0.77mm per rotation, as well as being compatible with our automated turning device. Prototype "V2" is a turnbuckle based system, using a central, rotating chassis and two inversely threaded screws. The chassis rotates around the screws, pushing them outward, expands with a movement of 0.7 mm per rotation, is unfortunately not compatible with our device. Prototype "V3" is a system based upon the current RPE design. Two inversely threaded screws are attached to a central gear, which feeds into two threaded blocks that are prevented from rotating by two support rods. It expands with a movement of 0.7 mm per rotation, and is compatible with our turning device. Major problems arose when it came to printing our designs, as our printers were unable to print with enough accuracy, however we are confident that given the right materials these designs would function and improve the ease of use of palate expanders.

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