Approximating Surface Matrix Band for Dentist to Use for Patients

Date: September 12th, 2024 - September 18th, 2024

Client: Dr. Donald Tipple
Advisor: Prof. Beth Meyerand
Team:

Roshan Patel - rgpatel3@wisc.edu (Team Leader)

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Joseph Koch - jmkoch7@wisc.edu (BSAC)

Problem statement

Surface matrix bands are devices used by dentists to separate adjacent teeth during restorations of interproximal cavities (cavities found in-between two teeth). The matrix band serves to support the restoration material, to provide shape and contour to the tooth being restored, and to protect the adjacent tooth. Ideally, the width of the space between the two adjacent teeth is just large enough to fit one matrix band in order to ensure close proximal contact area, which prevents food impaction and decay. In the case of two cavities on two adjacent teeth, this process is tedious, as the dentist must complete the process from start to finish for each adjacent tooth individually. The goal of this project is to create a dental matrix band that effectively partitions adjacent teeth for more efficient tooth restoration procedures on interproximal cavities by making it possible to complete two adjacent restorations simultaneously.

Brief status update

The team is conducting further background research into the device and working on the Product Design Specifications (PDS) draft. Meetings with the team, client, and advisor have been scheduled for 09/18.

Summary of weekly team member design accomplishments

- Roshan Patel
  - Completed the Product Design Specification draft.
  - Read through the prior year's reports to gain an understanding of what needs to be improved.
- Keleous Lange
  - Completed the PDS draft
  - Read the final report that the previous group wrote
  - Met with the client and the team on 09/12.
- Tanya Predko
  - Met with the client and the team on 09/12.
  - Completed assigned portions of the Product Design Specification (PDS) document.
  - Performed further background research on dental surface matrices and looked over previous semesters' progress on the project.
- Joseph Koch
  - Met with the client and the team on 09/12.
  - Completed the PDS draft

Difficulties / advice requests

There are no difficulties at this time.

Current design

N/A

Materials and expenses

Item	Description	Manufac-turer	Mft Pt#	Vendor	Vendor Cat#	Date	#	Cost Each	Total	Link
Category 1										
									$0.00	
									$0.00	
Category 2										
									$0.00	
									$0.00	

							TOTAL:	$0.00	

Major team goals for the next week

1. Attend meetings with the team, advisor, and client.
2. Obtain materials currently used at the dental office from the client.
3. Begin working on the Design Matrix.

Next week's individual goals

- Roshan Patel
  - Do preliminary research on the project.
  - Begin work on the design matrix.
- Keleous Lange
  - Research background dentistry information to understand techniques used in this application
  - Put together a list of items that we need from the client
- Tanya Predko
  - Begin working on the Design Matrix.
  - Conduct additional research on competing designs.
  - Meet with the team, advisor, and client.
  - Pick up materials provided by the client.
- Joseph Koch
  - Begin preliminary designs
  - Model designs

Timeline

Task	September				October				November					December	
	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13
Project R&D															
Empathize	X														
Background…															
Prototyping															
Testings															
Deliverables															
Progress Reports	X														

Prelim presentation															
Final Poster															
Meetings															
Client															
Advisor	X														
Website															
Update	X														

Filled boxes = projected timeline
X = task was worked on or completed

Previous week's goals and accomplishments

- This is our first week, so there were no previous goals or accomplishments

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Roshan Patel	9/11/2025	- Worked on the PDS - Read through prior project reports	3 2	5	8
Keleous Lange	9/11/2025	- Worked on the PDS	3	3	6
Tanya Predko	09/11/2025	- Worked on the PDS - Did research on surface matrices - Read through prior project reports	1 3 1	5	8
Joseph Koch	09/11/2025	- Worked on the PDS	3	3	6