



---

*Kerr Demetron Demi: Dental UV Curing Light*

## Kerr Demetron Demi - Project Brief

**Project Introduction:** In an effort to improve the ergonomics, functionality, and overall brand identity of Kerr's Demetron products, a complete re-design of their existing product was requested.

**Current Restrictions:** Prior to the beginning of the project, Kerr provided certain restrictions that had been established by their current product, the L.E.Demetron II.

- *newly developed electronics must be able to fit within the re-designed product*
- *a certain amount of air must be allowed to flow freely through the product, requiring ventilation ports and a pre-designated fan to fit within the product*
- *new design must be able to work with current Demetron light guides*
- *new design must be able to be compatible with current Demetron orange UV light guard*



**Client Wish List:** Aside from the restrictions, Kerr indicated several key criteria they would like fulfilled that would help determine the success of the product in the eyes of the company as well as the consumer.

- *improve ergonomics through research and form studies*
- *reduce weight and size without compromising power and product quality*
- *redesign current charging platform to coincide with new brand aesthetics*



## Kerr Demetron Demi - Project Research

**Current Product Research:** After receiving the initial project scope and criteria from the client, visits to area dentistrys were conducted. By being able to observe how these products were used and interviewing the dentists that worked with them, a lot of valuable information was attained that would later help the conceptual phase

- *current pistol grip keeps hand at a safe distance from the user's mouth, however, this also hinders control of the handpiece and discomfort for the dentist*
- *fixed angle of the handle causes the dentist to contort his hand or body in unfamiliar ways when working on certain areas of the mouth*
- *single ventilation area causes poor airflow through the product and prevents the user from accessing that area of the product because of potential over-heating issues*
- *location of parts towards the "front" of the unit adds more weight to that location and ultimately puts more pressure on the wrist*



- *the overall footprint of the product while it's charging should be relatively small to offer a larger available work area to the user*
- *reduce down-time by offering more than one charging location and multiple batteries*

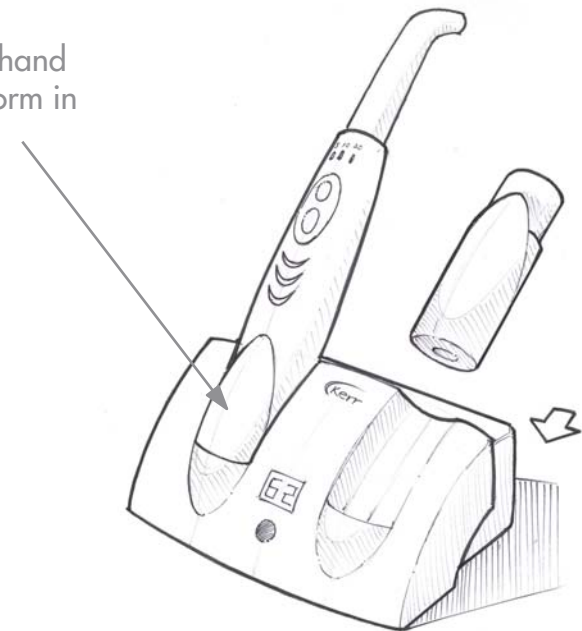


## Kerr Demetron Demi - Initial Concepts: Concept A

**Initial Concept Phase:** From the project brief and criteria that were given by the client, as well as the research that was done at area dentistrys, multiple concepts were worked on that all solved the various problems in a unique way. Lastly, to prove out the concepts, weighted prototypes were quickly developed for verification and more accurate judgement.



elliptical detail in hand piece concludes form in charger

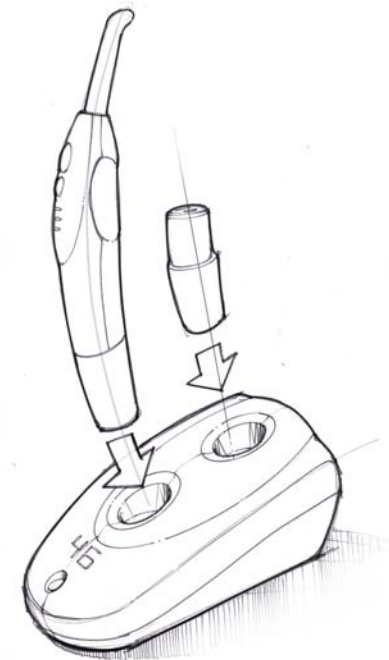
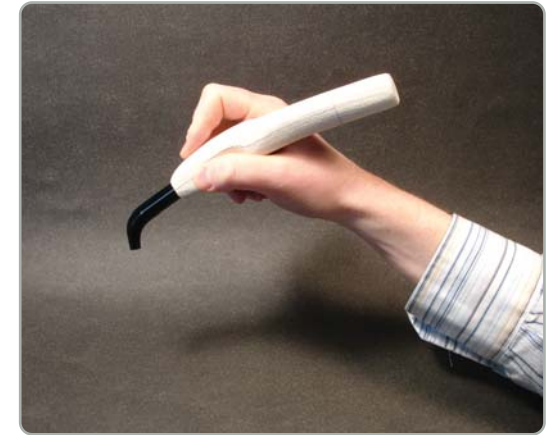


## Kerr Demetron Demi - Initial Concepts: Concept B

**Initial Concept Phase:** From the project brief and criteria that were given by the client, as well as the research that was done at area dentistrys, multiple concepts were worked on that all solved the various problems in a unique way. Lastly, to prove out the concepts, weighted prototypes were quickly developed for verification and more accurate judgement.



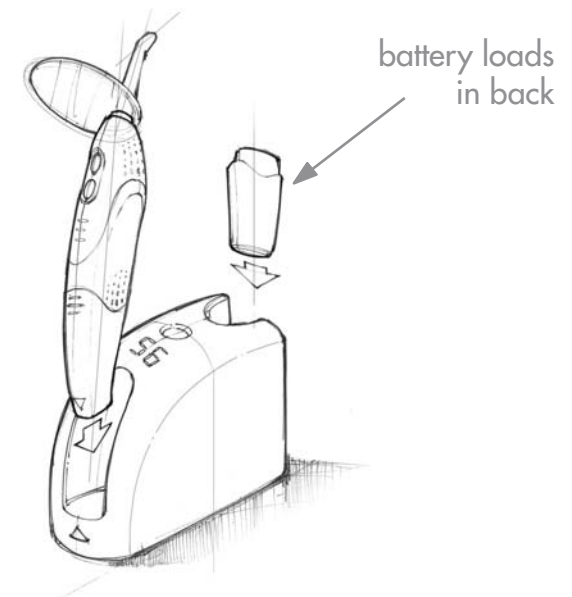
branding location





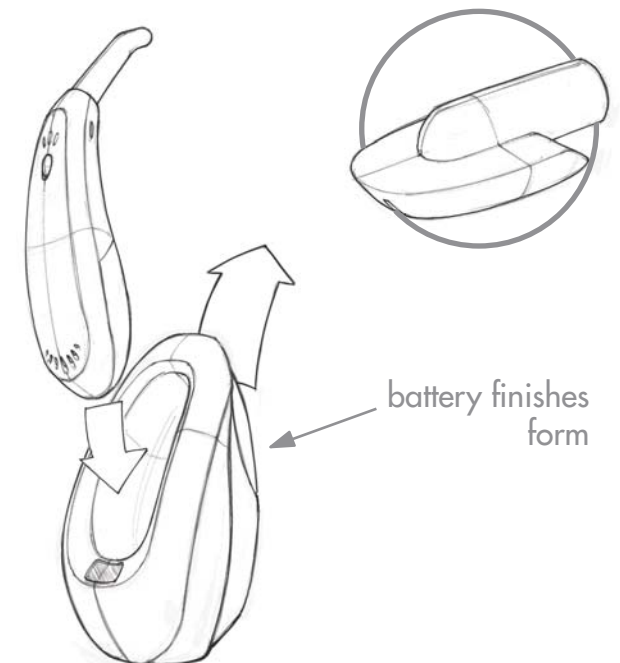
## Kerr Demetron Demi - Initial Concepts: Concept C

**Initial Concept Phase:** From the project brief and criteria that were given by the client, as well as the research that was done at area dentistrys, multiple concepts were worked on that all solved the various problems in a unique way. Lastly, to prove out the concepts, weighted prototypes were quickly developed for verification and more accurate judgement.



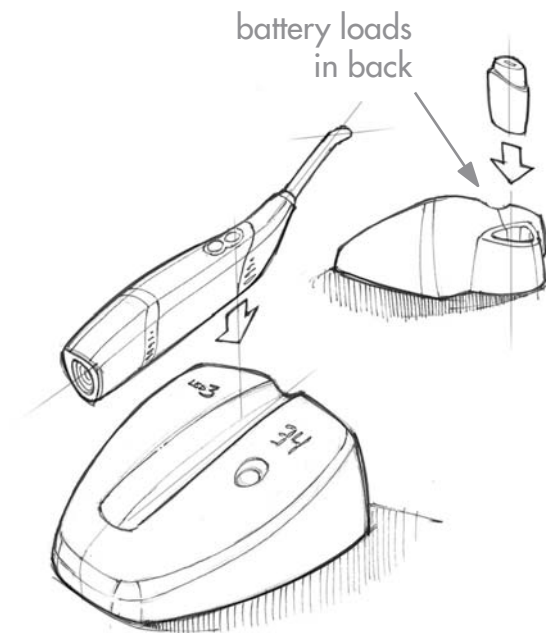
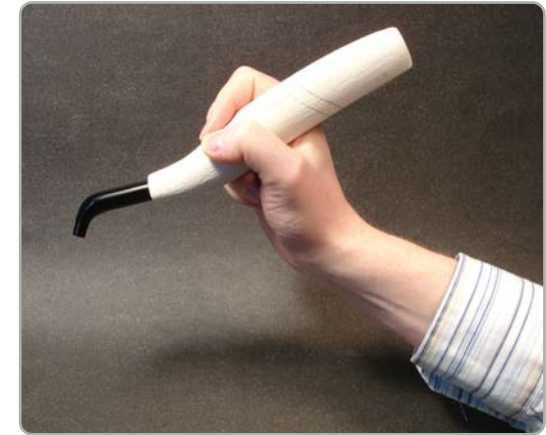
## Kerr Demetron Demi - Initial Concepts: Concept D

**Initial Concept Phase:** From the project brief and criteria that were given by the client, as well as the research that was done at area dentistrys, multiple concepts were worked on that all solved the various problems in a unique way. Lastly, to prove out the concepts, weighted prototypes were quickly developed for verification and more accurate judgement.



## Kerr Demetron Demi - Initial Concepts: Concept E

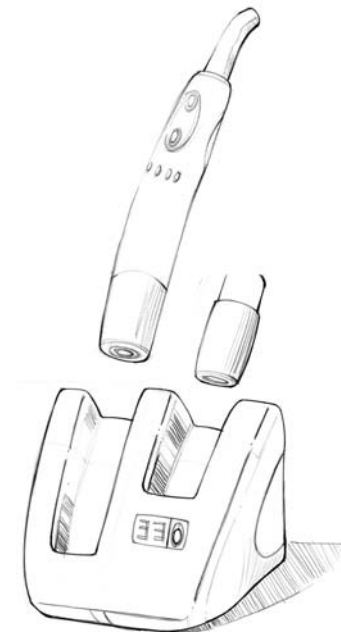
**Initial Concept Phase:** From the project brief and criteria that were given by the client, as well as the research that was done at area dentistrys, multiple concepts were worked on that all solved the various problems in a unique way. Lastly, to prove out the concepts, weighted prototypes were quickly developed for verification and more accurate judgement.





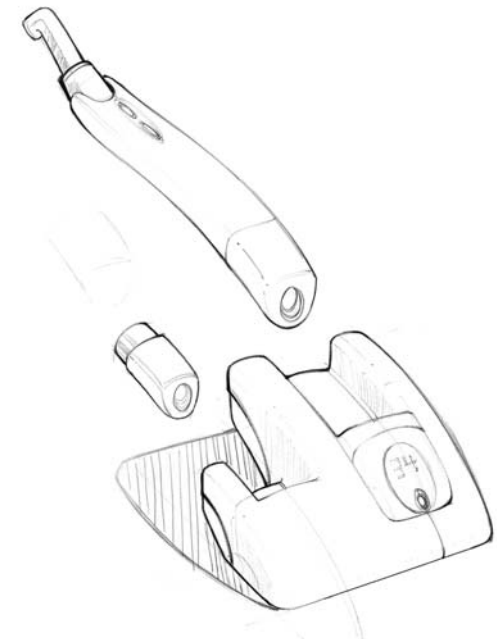
## **Kerr Demetron Demi** - Initial Concepts: Concept F

**Initial Concept Phase:** From the project brief and criteria that were given by the client, as well as the research that was done at area dentistrys, multiple concepts were worked on that all solved the various problems in a unique way. Lastly, to prove out the concepts, weighted prototypes were quickly developed for verification and more accurate judgement.



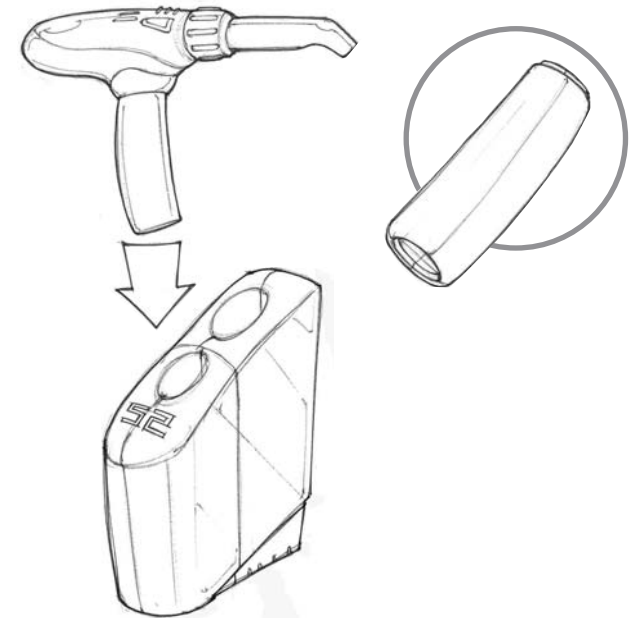
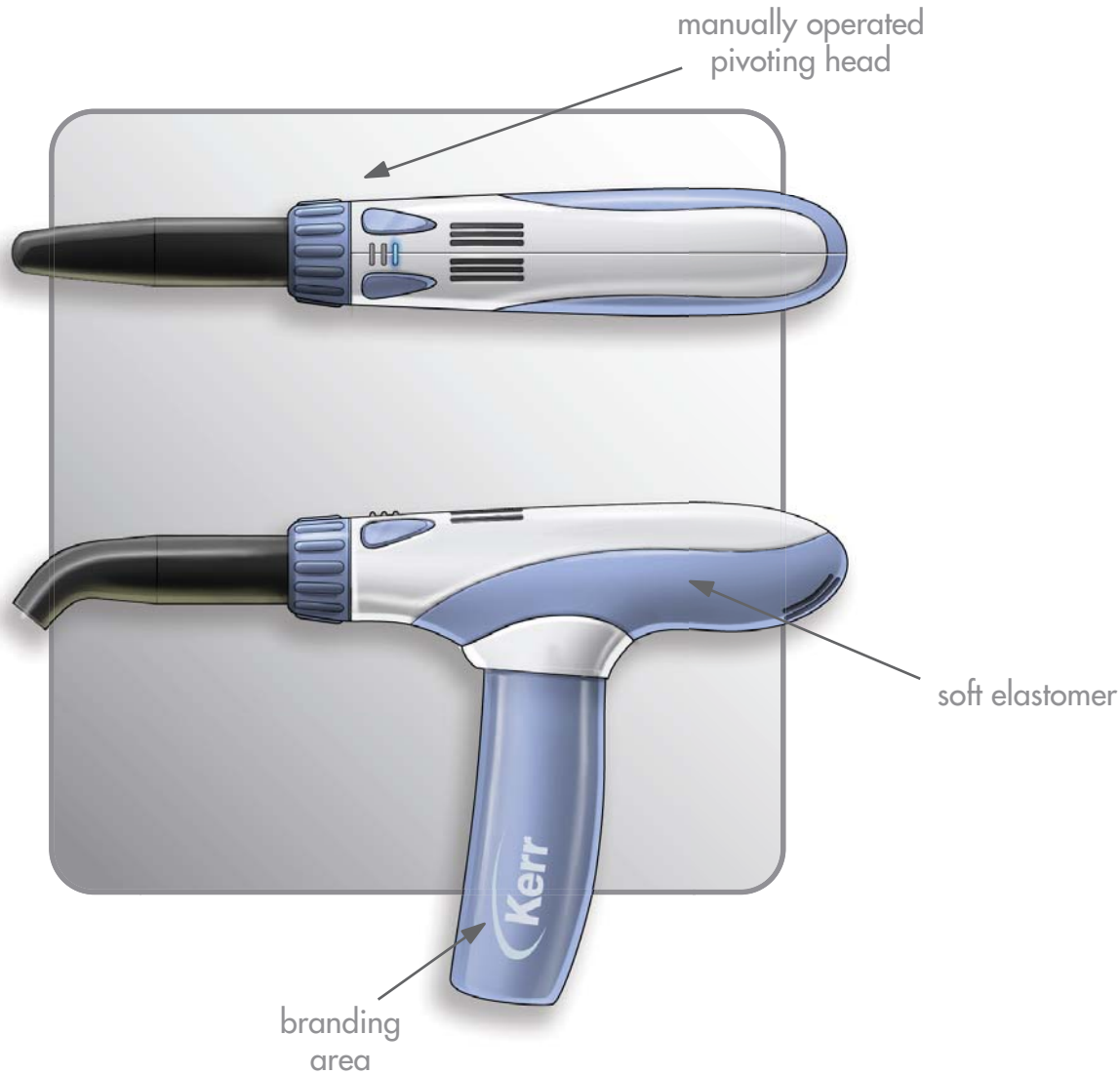
## Kerr Demetron Demi - Initial Concepts: Concept G

**Initial Concept Phase:** From the project brief and criteria that were given by the client, as well as the research that was done at area dentistrys, multiple concepts were worked on that all solved the various problems in a unique way. Lastly, to prove out the concepts, weighted prototypes were quickly developed for verification and more accurate judgement.



## Kerr Demetron Demi - Initial Concepts: Concept H

**Initial Concept Phase:** From the project brief and criteria that were given by the client, as well as the research that was done at area dentistrys, multiple concepts were worked on that all solved the various problems in a unique way. Lastly, to prove out the concepts, weighted prototypes were quickly developed for verification and more accurate judgement.



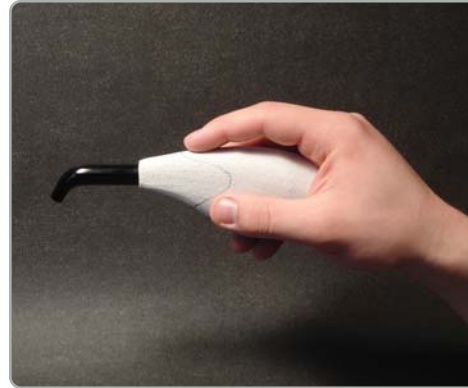
## Kerr Demetron Demi - Initial Concepts: Concept I

**Initial Concept Phase:** From the project brief and criteria that were given by the client, as well as the research that was done at area dentistrys, multiple concepts were worked on that all solved the various problems in a unique way. Lastly, to prove out the concepts, weighted prototypes were quickly developed for verification and more accurate judgement.



branding area

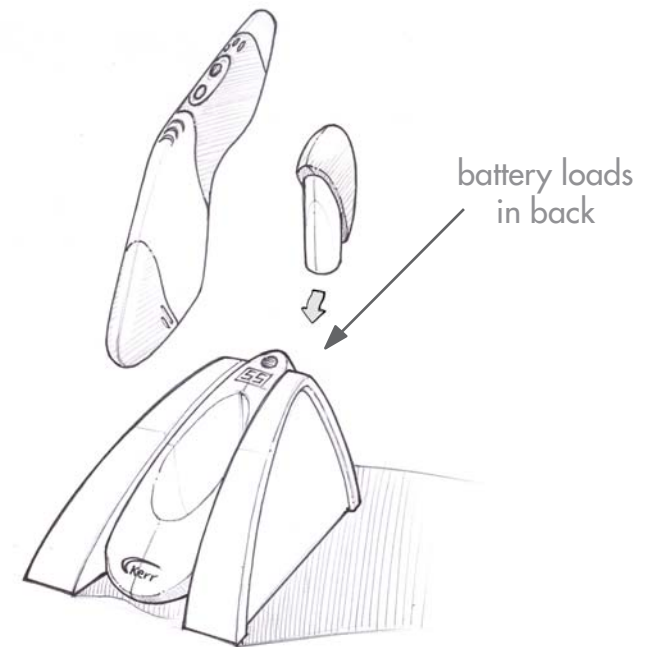
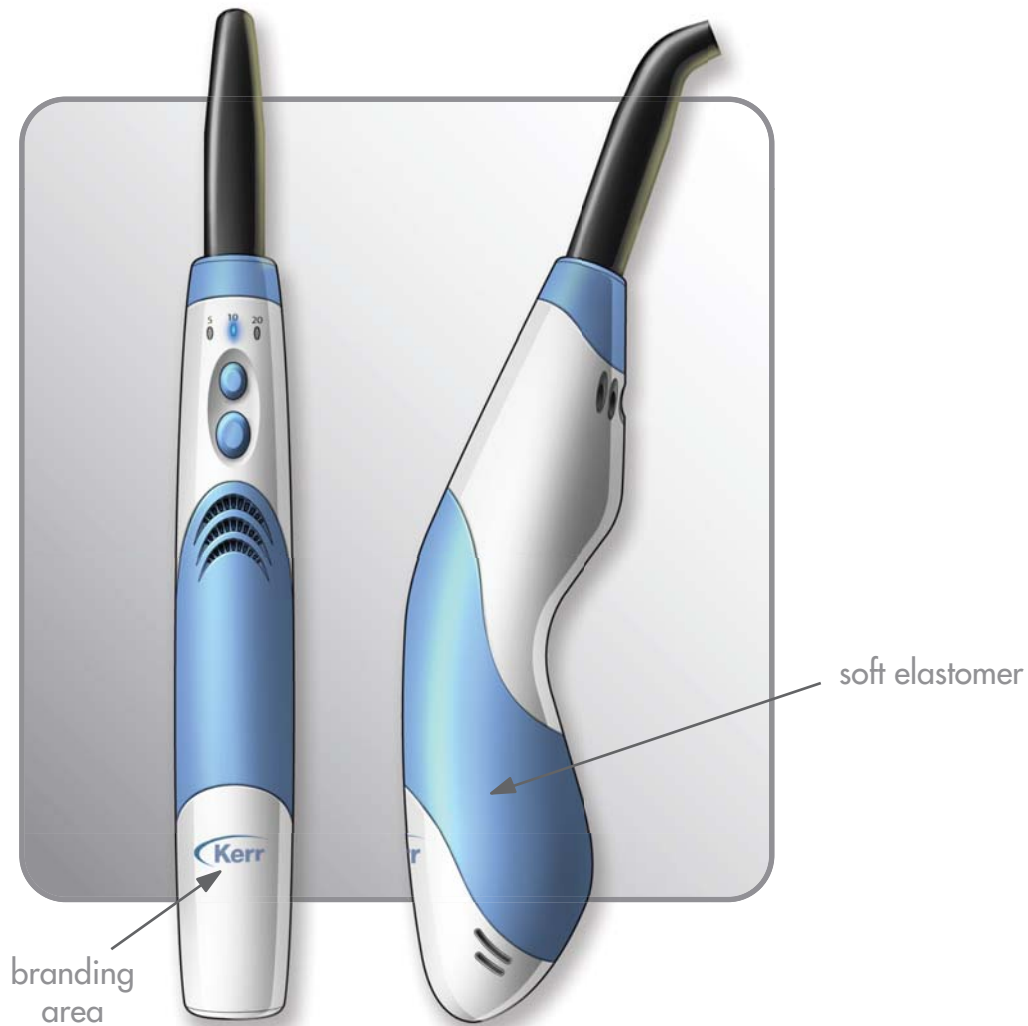
soft elastomer



proprietary battery

## Kerr Demetron Demi - Initial Concepts: Concept J

**Initial Concept Phase:** From the project brief and criteria that were given by the client, as well as the research that was done at area dentistrys, multiple concepts were worked on that all solved the various problems in a unique way. Lastly, to prove out the concepts, weighted prototypes were quickly developed for verification and more accurate judgement.





## Kerr Demetron Demi - Concept Revisions

**Concept Refinement Phase:** Upon review with the client, various elements of the initial concepts were worked together towards a more refined direction. Final details such as elastomer placement, logo placement, use of color, and battery interaction were weighted against cost, ease of manufacturing, and consumer comfort.

Option A



Option B

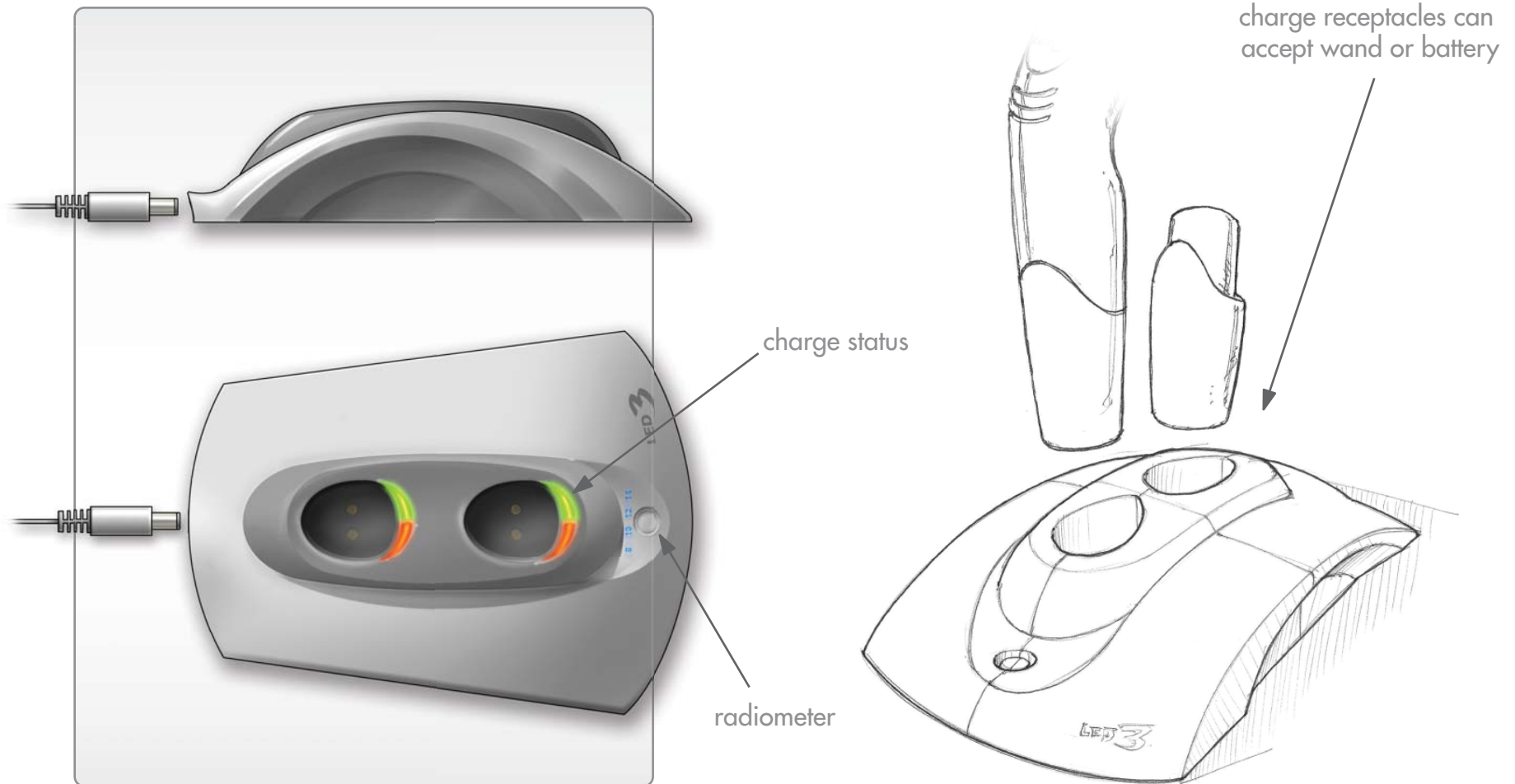


Option C



## Kerr Demetron Demi - Concept Revisions

**Charger Refinement Phase:** After deciding a final direction for the handpiece, the design of the charger was based on assuming similar aesthetic traits as the “wand”, maintaining a small footprint, being easy & intuitive to use, and being affordable and easy to manufacture at the same time.



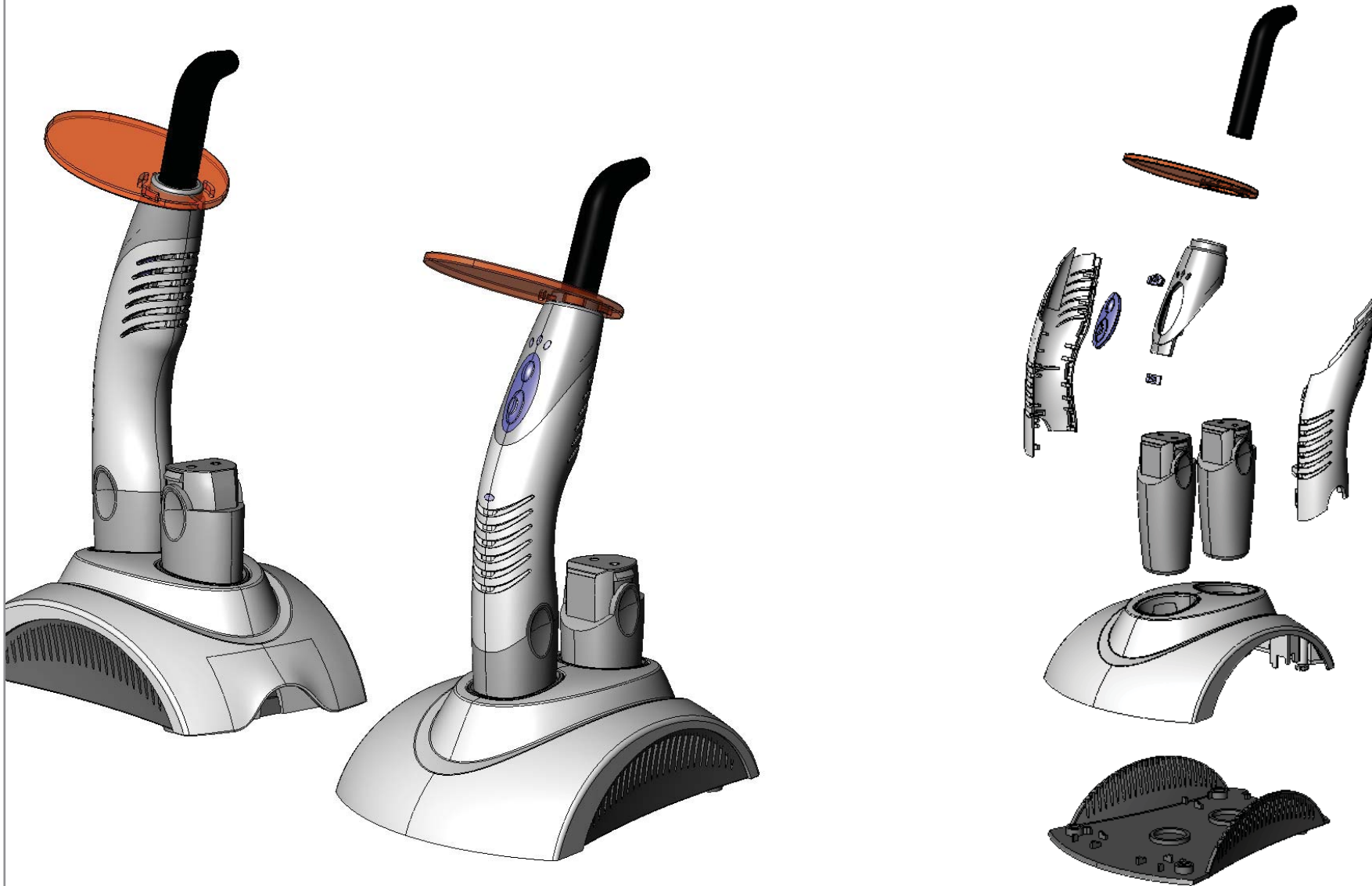
**Kerr Demetron Demi** - *Concept Revisions*

**Prototype Phase:** Prior to pursuing the design into CAD and Engineering phases, 1:1 scale weighted prototypes were made of every individual part to go over any potential ergonomic issues and verify that all of the components worked together as designed.



## **Kerr Demetron Demi** - Final Revisions

**Engineering & CAD Phase:** Once the final designs were reviewed and approved by the client, the final step was to take the designs into CAD with engineers and review everything from manufacturing feasibility to conducting FEA drop testing to help ensure that Kerr developed a high-quality product that profited both the end consumer as well as our client.



## Kerr Demetron Demi - Final Design

**Finished Product:** The final design, named "Demi", has been a tremendous hit in the marketplace. Lauded for its ergonomic answer to Demetron's already successful L.E. Demetron II, Demi also solves issues with ventilation, power management, and work space management without sacrificing the power and quality that customers have come to expect with Kerr.



- multiple ergonomic operating accommodations reduce stress on the hand and wrist
- new design maintains compatibility with existing Demetron light guides and guards
- increased ventilation prevents over heating and enables the use of multiple hand positions

- smaller charging footprint than previous model
- multiple charging ports
- charger LEDs indicate when battery is charged

