CUSTOMIZABLE, COMFORTABLE, AND CHEAP DAYTIME TOE POSITIONER (SET OF TWO)™

Alexandra, Tennessee
PROBLEM
I am 13 years old and already have bunions on my feet along with 36% of the population.

I wear nighttime toe correctors to help with the pain bunions cause. My toes are smushed throughout the day ruining any progress I made at night.

This problem affects all people with bunions.
Why should anyone care?

- Untreated, this can cause severe pain and lead to early arthritis.
- For bunions to be fixed later in life, surgery is required.
- Sometimes this surgery works, sometimes it does not.
- This surgery costs around $5,500.
- Also finding shoes that accommodate bunions and are stylish is a challenge.
Nighttime Toe Correctors

Bunion
EXISTING SOLUTIONS
- Silicon Toe Correctors - $20
  - *Only one size*

- Fabric Toe Correctors - $25
  - *Doesn’t hold in the correct place for long*

- Nighttime Toe Correctors - $20
  - *Only comfortable to wear at night*
MY SOLUTION
Customizable, Comfortable, and Cheap Daytime Toe Positioner (Set of two)™

**CHARACTERISTICS:**
- *Customizable*
- *Uses flexible material for full range motion*
- *Good grip on toe*
- *Cheap*
- *Worn during the day with regular footwear*
- *Easy to use*
- Maintains progress made while wearing nighttime toe correctors
Customizable

Using parameters, customers are able to put in personalized measurements to ensure the comfort and maximize the Toe Positioner’s abilities.

Customers send in measurements they made using the sizing guide.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
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<tbody>
<tr>
<td>ToeWidth</td>
<td>in</td>
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<tr>
<td>ToeLength</td>
<td>in</td>
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<tr>
<td>ToeCorrectionDist</td>
<td>in</td>
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<td>RingThickness</td>
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<td>SecondToeThickness</td>
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<td>BigToeThickness</td>
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<td>RingWidth</td>
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Wraps Around Big Toe

In Between Toes

Knuckle Joint Cut Out

Rests Against Skin

Hollow For Flexibility

Wraps Around Big Toe

Fillet Edges For Comfort
Material Used:

**NINJA FLEX (TPU FLEXIBLE FILAMENT)**
- $25 per reel
- One 0.5 kg reel equals at least 175 sets
- Super flexible
  - [NinjaFlex from bhphotovideo.com](https://bhphotovideo.com)
Cost per Pair

- $25 per reel/175 pairs = $0.14 to print a pair
- Marketing, Electricity, Adhesive (for bed), Maintenance, Time = $0.85 for each pair
- Total Cost Per Pair = $0.99
- Retail Price = $4.99 + Shipping and Handling
- Profit = $4 per pair
DESIGN PROCESS
Major Problem
- Bunions hurt and can cause early arthritis.

Solution
- 3D printed Toe Positioner (Set of Two)™

Problem with Toe Correctors Currently on Market
- Expensive, uncomfortable, and did not stay in place

Problem with Version 1
- Not Full Range of Motion

Solution
- Cut Out At Knuckle For Motion

Problem with Version 4
- Toe Positioner Had Sharp Edges Making It Uncomfortable

Solution
- Fillet All Edge For Smooth Feel and Comfort

Toe Positioner (Set of Two)™ Characteristics
- Customizable, Cheap, and Comfortable

Final Solution (Version 6)
Version 1

Original
Version 2

Cut Out For Movement
Version 3

Commented Parameters and Added Steps To Make A More Useful Toe Positioner™
Version 4

Made the Toe Positioner™ Hollow for Movement

Filleted Edges for Comfort
Version 5

Converted the Material in Fusion 360 to ABS (No NinjaFlex Option is Available)
Version 6

The Hollowed
Section Made Bigger
for Even More Motion
SOURCES
- Fusion 360
- Dr. Fredrick's Original Temporary Bunion Correctors
- https://bunionbootie.com/product/buy-bunion-bootie/?gclid=EAIaIQobChMIpLqniMDu3glIVwpyzCh0iHQJPEAqYAiABEgK0ePD_BwE
- NinjaFlex from bhphotovideo.com
- https://amino.com/blog/bunion-surgery-cost/
- www.sculpteo.com
THANK YOU FOR YOUR CONSIDERATION