INNOVATIONS IN COMPRESSION THERAPY

Shape Memory Textiles for Functional Compression Management

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Textile based Compression System

Bandage

Stocking
Current Challenges

1. Problem of size selection

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
<th>Extra large</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ankle circumference</td>
<td>-----</td>
<td>------</td>
<td>--------</td>
<td>------------</td>
</tr>
<tr>
<td>Calf Circumference</td>
<td>------</td>
<td>------</td>
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<td>------------</td>
</tr>
<tr>
<td>Length</td>
<td>------</td>
<td>------</td>
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</tr>
</tbody>
</table>

Headache for Manufacturers
Current Challenges

2. Problem in stocking application – Donning challenge
Current Challenges

3. Challenge in achieving desired pressure
Current Challenges

4. No Massage Effect
1. Problem of size selection

2. Donning challenge

3. Challenge in achieving desired pressure

4. No Massage Effect

Is it possible to solve these problems using a conventional textile?
Smart Textile
Smart Textile

*Privileged and Confidential Information
1. Customized Shape Development

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Smart Textile

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Smart Textile

1. Customized Shape Development

up to 100%

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2. Easy Donning

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2. Easy Donning

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Smart Textile

3. Pressure Control

P = 0 mmHg

P = 7 mmHg

P = 15 mmHg

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### How to adjust pressure without pressure sensor???

#### Measurement

<table>
<thead>
<tr>
<th>Leg circumference</th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
<th>Extra large</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original Tube Size I</td>
<td>$P_1$</td>
<td>$P_3$</td>
<td>$P_5$</td>
<td>$P_7$</td>
</tr>
</tbody>
</table>

*Original Leg Size*
4. Massage Effect

![Diagram of Smart Textile components]

- Heating layer
- MP actuator
- Base fabric
- Power
- Velcro fastener (hook)
- Velcro fastener (loop)

**Massage Therapy**

*Pressure, \( P \) (mmHg)*

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Summary

Challenges

- No Pressure Control
- No Massage Effect
- Donning Challenge
- Problem of Size Selection

Smart Textile
Smart Textiles

Vision
Acknowledgments

Mentors – Collaborators ..................

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iit delhi

University of Maribor

FULBRIGHT

USIEF

[Images of mentors and collaborators]
THANK YOU FOR YOUR TIME & PATIENCE

Questions, Comments, Concerns

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