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THE DEVELOPMENT AND QUALITY ENHANCEMENT OF MEDICATED FOOTWEAR FOR CONSCIOUSNESS ABOUT FOOT TROUBLES OF THE DIABETIC PATIENTS.

Sujit Kumar Ray[1], Adhir Chandra Paul[2,*], Md.Ashraful Islam[3] and Mihir Dutta [4]

[1-3] Department of Leather Engineering, Khulna University of Engineering & Technology, Bangladesh
[4] Department of Mechanical Engineering, Khulna University of Engineering & Technology, Bangladesh

[1]sujit.jess@gmail.com,[2,*]adhirkuet@gmail.com, [3] ashraf.kuet85@gmail.com,[4]Mihirdutta53@gmail.com

Abstract-*Diabetes is a group of metabolic diseases in which the person has high blood sugar either because insulin production is inadequate or because the body's cells do not respond properly to insulin or both. As the rate patients developing diabetes and prediabetes increases, the risk of developing ulcerations leading to amputation increases.The medicated Footwear introduces to improve in order to reduce foot ulceration and amputation risk in people with diabetes and neuropathy. In addition to lowering cholesterol and decreasing the risk of cardiovascular disease, walking for diabetic exercise also lowers blood sugar level and improves circulation to the legs and feet. The purpose of the study is to evaluate the prevention and consciousness about diabetic foot troubles for the Diabetic patients by developing the medicated Footwear and also enhance the quality that relieve areas of excessive pressure, reduce shock and shear, accommodate, stabilize& support deformities of foot. As a person suffering from diabetes definitely need to consider using Diabetic footwear, instead of normal footwear. These types of footwear offer good feet support and they are quite comfortable to wear. For this reason, Diabetic patients should be concerned about their shoes and should be used medicated Footwear instead of normal shoes. By using the medicated footwear, it is enabled to high compliance of ulcer prevention and reduces the amputation risk.*

Keywords: *Diabetes, ulcerations, consciousness, medicated Footwear, quality enhancement, prevention.*

1.0 INTRODUCTION:

Diabetes is a growing health problem around the World Health Organization (WHO) estimates that in 2030 more than 334 millions of persons will suffer from diabetes. Today, main problems for people with diabetes are due tothe complications that such one of the most relevant complications is called “diabetic foot”. It often leads to amputation. Peripheral neuropathy, a loss of feeling in the extremities, renders these individuals unaware of sores that develop on their feet until the wound becomes infected. Then, because of other diabetes-related complications, the infection often defieshealing and eventually leads to amputation. The maincause of foot ulceration in the adult neuropathy diabetic is thought to be the presence of abnormally high plantar pressures secondary to neuropathy. It is evident thatreduction of amputations can be achieved if it is possible to effectively prevent the foot ulceration[1]. Early diagnosis through a continuous foot monitoring can be applied.

But the best approach is to wear suitable personalized shoes that avoid the causes of ulcer. Despite needs, there is not a full user-centered footwear development due to the difficulty to simultaneously take into consideration multiple design aspects such as foot shape and biomechanic, materials performance for upper, insole and outsole, manufacturing methods. Diabetic shoe is specially designed shoes that feature extra and double depth, come equipped with a removable footbed and removable insole spacers and are finished with a smooth interior lining to reduce the risk of skin abrasions or blister[2-3].

This paper is to bring the object into the adopted footwear design approach and development and for consciousness about diabetic foot troubles for the Diabetic patients. Also it can enhance the quality & properties of the diabetic footwear that can reduce the ulcer and amputation risks.

2.0METHODOLOGY

2.1 MATERIALSREQUIREMENT:

The materials that is required for the construction of diabetic shoe:
Article Title:Diabetic Shoe.
Style: Slip on.
Last: Wooden.
Size: 41.
Upper Leather: Lamy black, Milled Softy type (thickness: 1.5mm).
Lining Leather: Goat leather (Brown), thickness:1.0 mm.
Padding: Nylon Mesh Foam, thickness:5mm.
Inter Lining: Knitted Fabrics.
Sole: Expanded EVA.
Insole: Cellulose Board.
In sock: Multi- Layer, EVA, Foam, Moulded EVA, Leather.
Toe Puff: TPR
Stiffener: TPR.
Adhesive: Latex, Water based PU/ Rubber solution.

2.2 WORKING FLOW DIAGRAM:

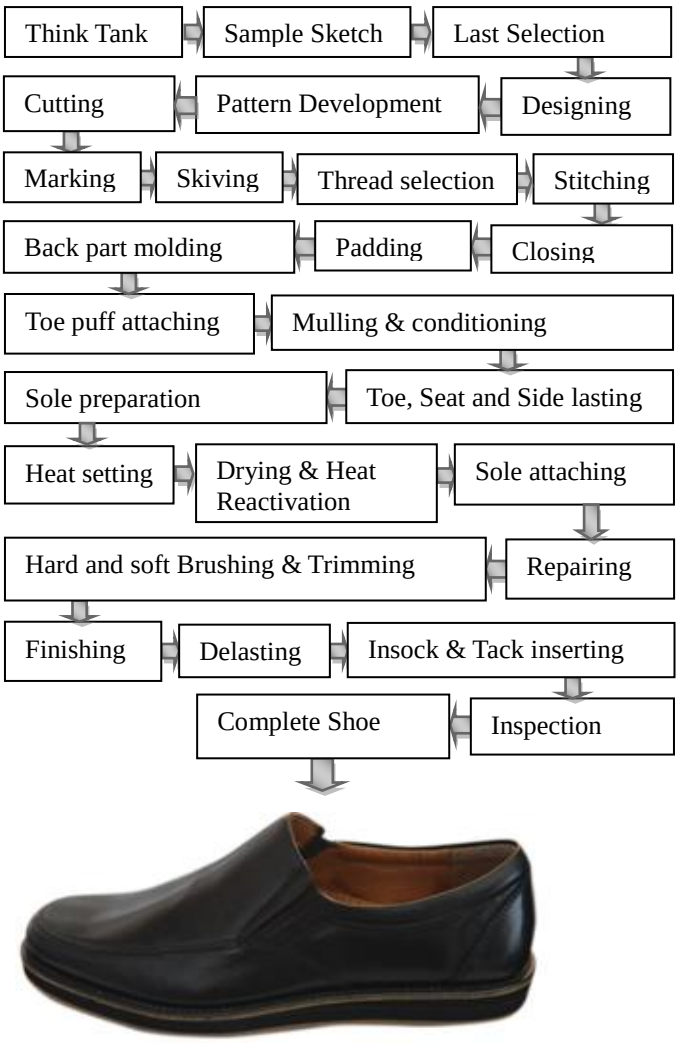

Fig.1: Working flow diagram.

2.3 DIABETIC SHOE DESIGN APPROACH:

configures footwear from patient data gathering, to shoes design, until manufacturing and usage. The environment of CAD will be discussed on its prime functionalities. Insoles and outsoles modules are under development together with the material selector system since they are confirm interrelated. Insole and outsole shapes will be based on design criteria deriving from the combination of measured foot pressure and material behavior. Also other parts of the diabetic shoe are designed by Biomechanical CAD[4]. The main criteria of insole and ousole and upper are so much different from each others. The upper materials of this shoe is so soft and flexible. The outsole and insole are soft and flexible. The toe portions of this shoe are wide, soft and flexible so that there is no rubbing between toe portion and foot and not resulting the foot ulceration. The geometric view of diabetic shoe of different view is shown below:

Fig.2:Sketch view of diabetic shoe by solidworks.

Fig.3: complete diabetic shoes.

3.0 RESULT AND DISCUSSION:

A more good advantage is obtained from diabetic shoe rather than the normal shoe for the diabetic patients. The following features added that will differ from normal Footwear and it is much more beneficial for diabetic Patients more than normal Footwear. The diabetic shoe has minimized frictional and uneven weight distribution. It is comfortable & has good gripping. It is a wide, roomy toe box to prevent the toes from being cramped. The sufficient space for toes prevents their deforming and local pressing[5]. It will reduce the different deformities of foot such as ulceration and amputation risk etc. To reduce the rubbing on the foot, seamless lining, made of soft fabric are used. Cushioning sole, with a true Toe-Spring design softens the step and helps propel foot forward.

Fig3: Design construction for diabetic shoe.

There is no seam at the topline of shoe to avoid the abrasion. There is also extra deep toe so that no rubbing occurred into Even many doctors are not even know the importance toe portion of foot and also reduce the ulceration and amputation risks etc. These are contained wide opening for entering the foot into the shoe without any foot problem.

3.1 COMPARISON BETWEEN DIABETIC&NORMAL SHOE:

Diabetic shoe is sufficient space for toes offers a loose fit and freedom for toe movement in contrast normal shoe not necessary for excessive space for toes. Diabetic shoe has maintained the wide opening at the top line but normal shoe not mandatory maintain the wide opening at the top line.
In diabetic shoe has cushioning sole with design but normal footwear used in any appropriate sole. In diabetic footwear seamless lining, made of soft fabric, and padded with foam. In contrast normal footwear any lining material to be used. This footwear especially for diabetic patients on the other hand normal footwear used for all.

3.2 BENEFITS OF DIABETIC SHOE:

The diabetic shoe conforms to the contours of the foot, enhancing comfort. It's seamless lining, made of soft fabric, and padded with foam, provide excellent protection. Also the only diabetic prefab orthotic with rear foot support that offers an arch filler and long lasting support. And it's cushioning sole, with a true toe-Spring design, softens the step, and helps propel foot forward[6].The extra-depth design in the toe portion of diabetic shoe offers a loose fit and freedom for toe movement. The hidden depth design offers the appearance of regular depth shoes. The overall using of the medicated footwear, it is enabled to high compliance of ulcer prevention and reduces the amputation risk of diabetic patients.

3.3 FINDINGS FROM WORK:

Lack of awareness about Diabetes mellitus among patients. Economic condition of our people is not good and enough to get proper medication and proper footwear. Even many doctors are not know the importance of diabetic

of diabetic footwear (they take it lightly).
Less Diabetic footwear manufacturers
No proper knowledge of diabetic footwear.
Lack of research in diabetic footwear.

4.0 CONCLUSION:

The all overview shows that there is a need of dedicated systems to support the development of shoes for people with diabetes and on the contrary, there are not available technologies to effectively overcome all problems implied in footwear customization, flexibility, rapidly and quality. So all industrialists and entrepreneur should come forward and take essential steps to develop the definite technology that will be accelerated the much production of Diabetic Footwear. Also this definite technology will help the diabetic patients to reduce the different foot troubles such as ulceration, amputation risk etc.

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6.0 NOMENCLATURE:

Symbol	Meaning	Unit
CAD	Computer added design	-
KB	Knowledge Based	-