

Development of high absorbency cum protective shoe for sports and industrial applications.

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Abstract - Technical textiles are having advanced features on specific applications compared to traditional textiles. It is something which is defined as value added products that are most probably used for their functional purpose. These textiles are only manufactured primarily for their technical performance. Protective textile is one of the parts in technical textile. PROTECH plays an important role in safeness of the human body. It will mainly protect humans from various natural or industrial hazards. These Protective clothing or materials are useful in many aspects but this work is something which is related to sports shoe and also industrial safety shoes. Shoes and Socks are the separate materials, in which Socks are useful for absorbing sweat. If we wear shoes without socks, after a few hours of removal it will definitely cause a too bad smell which makes us feel disgusting. Instead of wearing socks, my idea is to produce advanced shoes with a good sweat absorbing property and smoothness in the inner layer of the shoes with longer life. By using these advanced shoes the wearer's foot will be more healthy and comfortable to wear for a long time. Whenever these shoes get wet, it will dry so faster and easier because of the great absorbency effect. Due to faster drying, these shoes will not lead to bad smell. This makes it more comfortable for a sports person to wear these advanced shoes instead of wearing both shoes and socks. Industrial workers also can prefer this type of shoes for their safety aspect, because they aren't able to work without shoes on considering their safety purpose, it is a very helpful one. For these kinds of shoes, fibres used should have all these properties like absorbency, strength, fineness, flexibility and durability. It can achieve with the combination of micro polyester with other materials gives better effect. This idea is not only for sport and industrial shoes but also for regular use shoes.

keywords - Safety Footwear, Absorbency effect, Protection, longer life, Industrial and sports wears, etc.,

1. INTRODUCTION

Textiles are one of the primary needs of human beings; Technical textiles are more advanced when compared to traditional textiles. It is something which is defined as value added products that are most probably used for their specific functional purpose. These textiles are only manufactured primarily for their technical performance. In the last two decades, it's facing tremendous growth in the non standard sectors like protecting consumer goods, Medical textiles, Geotextiles, Automotive parts, Building materials, Sports textile, etc. In the technical industry, technical textiles are the most dynamic one and are promising areas for the future of the textile industry. Technical textile products having high performance fibres, yarns, chemicals to meet the requirements. Special methods and specially built machineries are required to manufacture these products and so the cost is very high. Also it is designed to perform heavy duty and demanding applications.



1.1. NEED OF PROTECTIVE FABRICS IN SHOES

Protective clothing is an important part in technical textiles which protect us from various problems like injuries, deaths, natural or industrial hazards and so on. In protective fabrics we must need protection rather than outlook appearance. Basically protective fabrics are made using stronger fabrics like Aramid, carbon, glass etc., These textiles are actually our life saving textiles. There are many varieties of protective clothing available for specific hazards. Examples of the body or skin protection include laboratory coats, coveralls, vests, sports and industrial shoes, jackets, aprons, surgical gowns and full body suits. Even nowadays these particular protective textiles become in demand, so that in future also it will definitely reach a great peak.

This research aims mainly at sweat absorbing in shoes. It is useful for industrial workers and sports persons. As a general rule a person should replace his shoes for 8-12 months frequently. From this sweat absorbing shoes that duration can be made longer. For the property of sweat absorbing air permeability is required to control the bad odour. There are many kinds of footwear available on the internet today but we have an idea to produce advanced absorbency footwear. By executing the ideas like these, industrial workers and sports people can get more beneficial by this, like they are able to wear these advanced absorbency shoes for a long period of time and so the usage time will increase, it results in they feel more comfortable. Ordinary footwear makes us feel disgusting by producing a bad odour after wearing it for a long time and also moreover it is not healthier for our feet.



1.2. ADVANCED PROTECTIVE SHOES

Durable boots or safety shoes provide reinforced protection from compression, electric shocks, chemical hazards etc. Our idea is to produce advanced shoes with a good absorbent property and smoothness in the inner layer of the shoes with longer life. By using these advanced shoes, the wearer's foot will be healthier compared to regular shoes. Whenever these shoes get wet, it will dry so faster and easier because of the great absorbency effect, due to faster drying; these shoes will not lead to bad odour. This makes it more comfortable for a sports person to wear these advanced shoes instead of wearing both shoes and socks together. Industrial workers can also prefer these types of shoes for longer time usage because they aren't able to work without shoes on considering their safety purpose.

2. DETAILED DESCRIPTION ABOUT OUR RESEARCH WORK

Footwear is one of the important things which save our feet from injuries due to heat and cold. Whenever we wear shoes, it should make us feel comfortable because we are going to wear it for a long time. Considering that this idea is to produce advanced shoes which have good absorbent property. If the shoes have high absorbency, we can wear it without socks for a whole day. By wearing these shoes, it will keep our feet healthy, dry and pleasant. It should have good wickability which is an important function other than breathability and protecting human skin from UV rays injury.

Mainly industrial workers must need these kinds of shoes or boots that makes them feel very comfortable. They used to work in day time approximately 8-12 hours and sometimes even for night time. Inside the industries they must wear shoes for their safety purpose. For them we have an idea to produce these types of advanced absorbency shoes and a sports person can also prefer these shoes for better performance. Mostly protective footwear can in all shapes and sizes and still maintains its durability, as long as it's built with quality materials and innovative technology. Protective clothing is now a major part of textiles classified as technical or industrial textiles. Protective clothing refers to garments and other fabric related items designed to protect the wearer from harsh environmental effects that may result in injuries or death. Our idea about advanced absorbency shoes will become more successful and necessary in future. These advanced shoes or boots should absorb sweat easily and get dry as soon as possible. It will be a more helpful and safe product, It will also be an important work for health and safety workers in the ministry of defence, police and fire service, industrial workers and sports players.

2.1 USAGE OF VARIOUS FIBERS SUITABLE FOR ADVANCED ABSORBENCY AND PROTECTIVE SHOES



There are many fibers which are best for shoes.

Cotton - It has better odour management compared to other materials. It's breathable and doesn't hold on to the by-products of activity like foul smells and odours.

Calico - It is the sub material of cotton. This material is highly absorbent, is also generally very cheap due to its unfinished nature, and the fact that it remains un-dyed and raw.

Spandex - This material is also known to absorb sweat, breathe and dry quickly - so overall it's a great choice for cheap, feature-rich, malleable material.

Polyester - It has high strength and durability and even insulating property.

Microfiber - Material is highly absorbent and non-abrasive in nature.

Synthetic - This material is breathable and also quickly absorbs sweat.

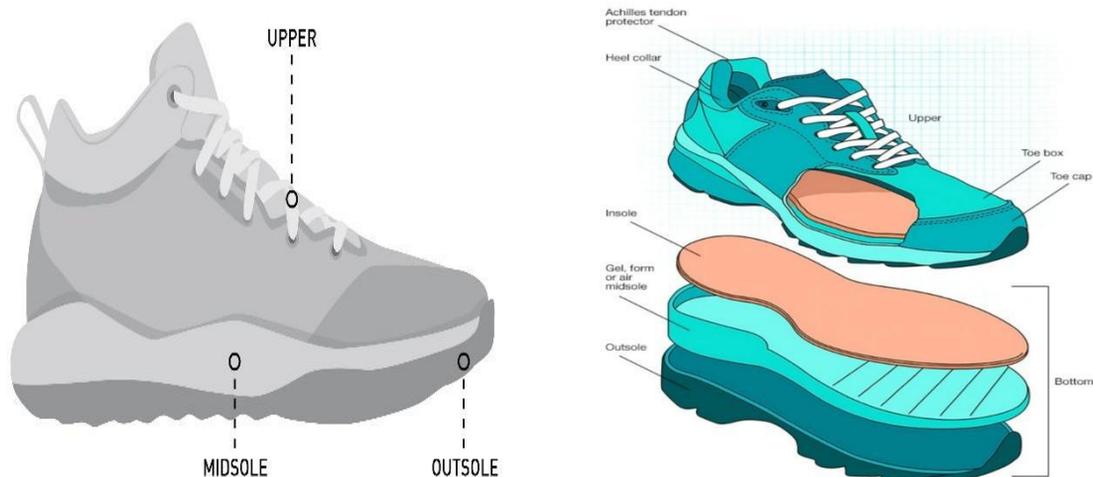
Bamboo fibre - Bamboo fibre is also moisture wicking, making it a completely odourless sportswear. It also provides amazing protection from UV rays.

Nylon - Nylon is stretchy, quick-drying, and mildew resistant. It's also incredibly breathable. The fabric allows cool air to reach the skin and also wicks sweat from your skin to the fabric's surface, where it can evaporate safely - leaving you comfortable and temperature controlled.

Gore-Tex - It keeps wind and water outside but allows sweat to evaporate.

Here there are many fibers that have a property of high water absorption; we can make use of these fibers for producing advanced absorbency shoes. I have a plan to use polyester for high strength and durability. Spandex, nylon, micro fibre, calico, and cotton all these fibers are very useful for absorbing sweat and getting dry quickly. It has a high degree of absorbing nature and also microfiber gives better wickability than any other material we prefer this combination to absorb sweat. These fibres will make us feel comfortable and keep our feet dry. If it gets dry so easily, we can wear that footwear for a long time per day without wearing shocks. In our world, industrial employees are higher in strength so this footwear will definitely make more use for them. Even a sports person can also prefer this kind of shoe for their safety and comfort purpose.

2.2. MODIFICATIONS GIVEN FOR SHOES



There are many kinds of footwear available on the internet, but we have an idea to produce advanced absorbency footwear. I am giving modifications in shoe's absorbing properties using various fibers which we discussed above and the structure of shoe's are also modified by our idea. By using these fibers our sweat will get absorbed and dried easily. In shoes there are some holes provided for aeration. We can wash those shoes by removing their base part separately and we can make use of those shoes for a longer time. So these are some modifications we wish to give for those advanced absorbing shoes.

I am going to execute my idea especially in the midsole layer of the shoes, by placing the most absorbing fibre property layer so that it can absorb sweat, and then the next layer we can use micro fibers and polyester for high strength and durability, provide some tiny holes outside for aeration then it will become odour free absorbency shoes. The Outsole layer is made using nylon fibers, which provides good abrasion resistance. A special thing in this research is we should remove the midsole as well as outsole layers separately for washing purposes.

3. BENEFITS THROUGH RESEARCH WORK

- Industrial workers and sport players gain the best advantages of odour free shoes and free from skin issues even for long term usage.
- They can afford easily to get this product instead of buying both shoes and socks.
- It is reusable by washing easily.
- It is washable after using for many times and if dried properly it can be reused for a long time
- The fibres used in this product can avoid abrasion and can be for a long term of time.
- It can be used by all types of workers in various industries and this product plays a vital role in their lives.
- Ensures safety precautions of the people.

4. CONCLUSION

Protective clothing is one of the important areas in textiles which is growing faster in this global market. These advanced absorbency shoes will become more successful and necessary in future. These advanced shoes or boots should absorb sweat easily and get dry as soon as possible. It will be a more helpful and safe product so that we should make use of it. It will also be useful for health and safety workers in the ministry of defence, police and fire service, industrial workers and sports players. The fibres should have the properties like absorbency, strong and durability which makes shoes or boots as the quality product so that we can wear or use it for a longer time period. People should keep on trying these innovative ideas until it becomes successful. All textile engineers should come forward to develop these innovative ideas in the technical textiles field.

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