AN ATTEMPT TO DESIGN AND DEVELOP ANTISKID SOCKS

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ABSTRACT

Skid-resistant surfaces as described having either a pressure-sensitive adhesive layer or a highly filled, textured binder to reduce skidding. The surfaces are applied to trafficable surfaces such as roof and floors. Products such as roof underlyments bearing the surfaces are described in particular.

INTRODUCTION:

Traditional antislip socks, design focal point be socks it is anti-skidding between footwear in itself and more be using concavo-convex Structure is anti-skidding, or the use silicagel pad also having carry out it is anti-skidding, be not worn on it is more uncomfortable, and cannot ensure socks and pin it Between skidproof effect.The main objective of the project is prevent from falling with the help of gripper Antiskid socks have been suggested as a means of preventing accidental falls due to slips Non-slip socks improve safety, performance, and hygiene. You can find non-slip socks with thick density grip dots for improved grip effect and breathability with acupressure Testing methods are wet pendulum test method and inclined Ramp test It should be designed to grip the floor, even when it's wet or oily.

METHODOLOGY

Raw material

- Raw material for manufacturing socks including cotton,bamboo fibre . because bamboo fibre have excellent antibacterial properties and silicagel for gripper effect
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Yarn manufacturing

- Yarn manufacturing is a sequence of processes that convert raw cotton and bamboo fibres into yarn suitable for use in various end-products. First, the bamboo leaves are crushed, its inner pith, and the trunk to break down the material physically. Second, the crushed Bamboo is soaked in a sodium hydroxide solution at 20 to 25 degrees Celsius for one to three hours. The process forms alkali produces alkali cellulose.

  Third, the cellulose is pressed to remove excess sodium hydroxide from the mixture, and then it is crushed in a grinder and left to dry for 24 hours.Fourth, add almost three times the amount of carbon disulphide to the cellulose as it will turn it into jell. Fifth, decompress the jell to evaporate any excess carbon disulphide and then add sodium hydroxide to the resultant sodium xanthogenate, which produces a viscose solution of 5% sodium hydroxide and seven to 15 per cent bamboo fibre.

  Bamboo cellulose is squirted into a sulfuric acid solution via a spinneret nozzle, which produces bamboo threads that are spun into bamboo yarn. The yarn is then knitted to create socks, bed sheets, clothing

Knitting

Using programmed codes in step 1, multitude of needles then knit the various threads into a series of interlocking loops. Computerized sock knitting machines work at high speeds and can easily be programmed to produce a wide variety of socks. 1st inline-inspection is implemented here to avoid mistakes like length, trimming, interlocking etc.

Linking/Sewing

Knitting makes a cylinder tube, thus we need to the sewing process in order to link the seperated toe parts together. This is usually done by machine,

Silicagel printing

After finishing process socks is taken to the printing process in which the silicagel is printed at thick dot like design ,it will act as a griper

Boarding

After knitting and wet processing, socks normally are hot-pressed into the two-dimensional shape of a lower leg and foot, in a process called "boarding." Various technologies are used for boarding, but all involve the use of a boarding form, steam, heat, and pressure. Boarding of cotton socks is a method of pressing for packaging and shape retention. For blends containing stretch fibers, such as spandex, or thermoplastic fibers, such as nylon or polyester, the boarding temperature can be high enough for heat setting, which will give the sock a memory for the shape in which it is boarded, reducing shrinkage.

Testing

- Air permeability test ,absorbancy test ,wet pendulum test ,inclined ramp test

TESTING APPARATUS AND PROCEDURE

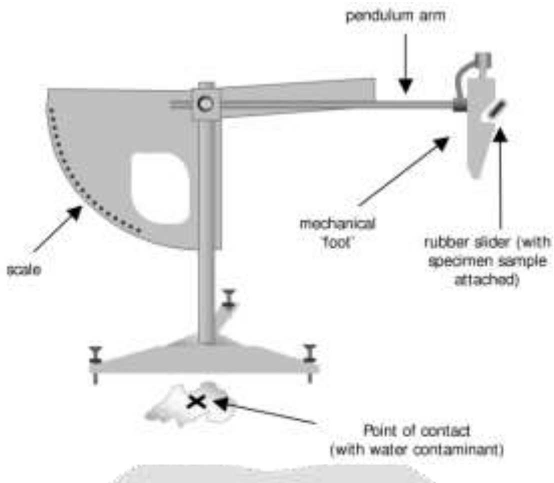
Wet Pendulum Test

The Wet Pendulum Test was completed in accordance with AS/NZS 4586:2004 [10] using a calibrated Munro-Stanley Pendulum Friction Tester. The Wet Pendulum Test is a test designed to simulate the mechanics of a person slipping on a wet surface.

The terminal end of the pendulum arm has a mechanical foot with a spring-loaded rubber slider attached, to simulate the heel of the foot (Figure (Figure1).1). The floor surface is saturated with deionised water prior to testing to simulate the presence of a fluid contaminant. The test is set up with the apparatus level to the floor and the length of the pendulum arm adjusted such that the rubber slider 'kicks' through when released, contacting the floor surface momentarily. On 'kicking' through, a loss of momentum occurs due to the friction generated at the point of contact.

The amount of friction is dependant on the slip resistance characteristics of the floor and 'heel' surfaces. This loss in momentum causes a proportionate reduction in the arc described by the pendulum which is measured on an inverse scale affixed to the tester. The scale provides a British Pendulum Number (BPN) which is the unit of measurement for this test.

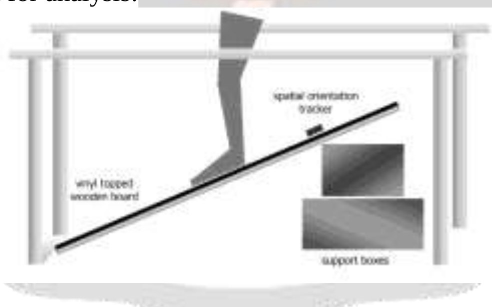
A higher BPN indicates higher slip resistance. A detailed description of the Pendulum Friction Testing protocol is available as an appendix to the AS/NZS 4586:2004



The Wet Pendulum Test is normally used to test different floor surfaces for slip resistance while the rubber slider is conditioned before testing to provide a constant slip resistance. However, for the purpose of this study the conditions were reversed, by keeping the floor surface constant (2.0 mm thickness hospital graded vinyl) and varying 'foot' conditions by draping the test samples over the slider. Samples were adhered to the rubber slider using double-sided adhesive tape to eliminate bunching of the material on contact. Five different specimens cut from the ventral surface of the samples were tested three times each, producing fifteen readings per sample. Testing was performed at an ambient temperature of 23°C (prescribed testing temperature range).

INCLINED RAMP TEST

The surface of the ramp was constructed by mounting a 900 mm × 600 mm panel of 2.0 mm thickness hospital grade vinyl (AS/NZS 2055.1:1985) [12], on to a rigid wooden board as per manufacturer's instructions. The ramp was bracketed on one end and the angle of inclination was adjusted by shifting support blocks forwards or backwards. The ramp was positioned in between a set of mobile parallel bars (Figure (Figure3).3). An Intersense InteriaCube® inertial orientation reference system was used to accurately measure the inclination of the ramp. The sensor was taped to the surface of the ramp such that the 'pitch' reading provided the angle of inclination. Data was monitored on a laptop in real time. The testing procedure was recorded on video to enable verification of manually collected data prior to transcription to a spreadsheet for analysis.



Once the angle of inclination was set (with an error tolerance of 0.2°), participants were asked to stand on the ramp and attempt to maintain an erect posture unsupported for a minimum of three seconds. If successful, the angle of the ramp was increased in one degree increments and the test was repeated until a slippage point was noted. Once slippage occurred, testing of that particular foot condition for the participant was complete. This procedure was repeated for every foot condition with each participant (non-slip socks, compression stockings, bare feet, and standard socks). Where multiple sizes of a non-slip sock product were available, these were also tested. The ramp surface was wiped down periodically to reduce contaminant build-up during testing.

CONCLUSION

Non-slip socks demonstrated poorer slip resistance than bare feet. It is therefore suggested that patients would be more likely to slip whilst mobilising in non-slip socks compared to bare feet. Non-slip socks offer marginal benefit in slip-resistance over compression stockings in dry conditions, however slip resistance of such products in the presence of fluid contaminants needs to be explored further. This study did not explore whether traction provided by bare feet was comparable to 'optimal' footwear such as shoes. However, previous studies have associated barefoot mobilisation with increased falls. It is therefore suggested that all patients continue to be encouraged to mobilise in appropriate, well-fitting shoes whilst in hospital.

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