



DEVELOPMENT OF VETIVER POWDER INFUSED EYE MASK FOR ENHANCED SLEEP QUALITY AND EYE COMFORT

¹Dr. V. Mahalakshmi, ²Mrs. J. Keerthika, ³Ms. M. R. Yamuna

¹Head & Assistant Professor, ²Assistant professor, ³PG Student,
PG Department of Costume Design and Fashion,

KSR College of Arts and Science for Women, Tiruchengode, India-637215

ABSTRACT

Eye strain is a term generally used in the digital age. It occurs when your eyes get tired after concentrating on a particular task for an extended period of time. Its signs consist of sore, worn-out, burning or itching eyes, dry eyes, even sometimes watery eyes, blurred double imaginative and prescient, headache and multiplied perceptivity to light. Eyestrain can be annoying and unwelcome. It also leads to serious or long-term consequences like problems with your retina, cataracts, age-related macular degeneration and sleep disturbance. Eyestrain is substantially affecting two sectors of people; drivers and software engineers. Drivers, especially truck drivers, may need to push for a long hours of driving with unfixed routine driveways and weather conditions. Being continuously exposed to bright light or flare, they suffer from eyestrain and sleep disturbances. Software engineers who view computer screens and other digital bias for long time are enduring 'Computer vision syndrome' also called as digital eyestrain.

KEYWORDS:

Eyestrain, drivers, software engineer, sleep disturbances, cooling property.

INTRODUCTION

Nowadays, the term eyestrain is more frequently used in this digital world. It is a circumstance that happens whilst your eyes get worn-out from excessive use, along with at the same time as driving lengthy distances or watching pc monitors and different virtual gadgets. This medical condition of eye strain is often used by people to classify a list of indistinct symptoms correlated to visual activity. Eyestrain is stressful and but it is not serious and can be relieved by resting our eyes or by taking other steps to reduce our eye discomfort. In a few cases, these symptoms can imply a rudimentary eye circumstance that desires diagnosis and medication.

Signs and symptoms of eye strain include sore, worn-out, burning, or itchy eyes, watery or dry eyes, blurred or double imaginative and prescient, headache, neck pain, or shoulder pain, increased sensitivity to light, difficulty concentrating, feeling that you cannot keep your eyes open, mild tearing or dryness and tightness of the temples. Asthenopia is the clinical term for eye stress.

METHODOLOGY

Selection of fibre

Viscose :

Viscose fibre, also known as rayon, is a semi-synthetic fibre made from natural sources such as wood pulp. It's known for its softness, breathability, and draping qualities, often used in clothing, upholstery, and textiles. However, it's not as durable as some other synthetic fibres and can wrinkle easily.

Cotton:

Cotton fibre is a natural fibre derived from the cotton plant's seed pod. It's one of the most widely used natural fibres globally, valued for its softness, breathability, and absorbency. Cotton is commonly used in clothing, bedding, towels, and many other textile products. It's versatile, comfortable, and easy to care .

Selection of fabric

White bleached cotton

White bleached cotton refers to cotton fibres that have undergone a bleaching process to remove any natural coloration or impurities, resulting in a bright white appearance. Bleached cotton is commonly used in various applications where a pure white color is desired, such as in textiles, medical products, and cosmetic applications.

SELECTION OF FINISH

Vetiver powder

Vetiver powder finish is a treatment used in textiles, particularly for fabrics made from viscose fibres like those used in eye masks. Vetiver powder, derived from the roots of the vetiver plant, is known for its antimicrobial and insect-repellent properties. When applied as a finish to viscose fabric, it can provide additional benefits such as odor control and moisture-wicking. In the case of eye masks, this finish may help enhance comfort and hygiene for the wearer.

Vetiver powder properties:

Antimicrobial: Vetiver powder has antimicrobial properties, which can help inhibit the growth of bacteria and fungi. This property makes it useful in various applications where hygiene is important, such as in textiles and skincare products.

Cooling: Vetiver powder has a cooling effect, making it popular in skincare products and cosmetics. When applied to the skin, it can provide a refreshing sensation and help soothe irritation.

Aromatic: Vetiver powder has a distinct earthy and woody aroma, which is often used in perfumery as a base note. Its fragrance is calming and grounding, making it a popular choice in aromatherapy and relaxation products.

PROCEDURE:

Carding process:

The carding process for viscose involves separating and aligning the fibres to prepare them for spinning. First, the viscose fibres are fed into a carding machine where they are opened up and disentangled. Then, the fibres are formed into a thin web and passed through rollers to align them in a parallel orientation. This aligned web is then condensed into a continuous strand.

Lab forming (cross lapper machine)

Lap forming is a metalworking process used to join two overlapping sheets .

1. **Preparation:** Select the appropriate materials and determine the dimensions of the overlapping sheets based on the final product requirements.
2. **Cleaning:** Ensure that the surfaces of the metal sheets are clean and free from any contaminants or debris that could affect the quality of the lap joint.
3. **Marking:** Mark the areas where the sheets will overlap. This can be done using various methods, such as scribing or using a template.
4. **Forming:** Use a suitable forming technique to create the lap joint. This could involve processes like bending, rolling, or pressing the edges of one sheet over the other to create the overlap. The specific method used will depend on factors such as the material, thickness, and desired joint strength.
5. **Fixturing:** Secure the sheets in place using clamps or fixtures to maintain the desired overlap and prevent movement during the forming process.
6. **Finishing:** After the joint is complete, any excess material or imperfections can be trimmed and the surface can be finished as needed to achieve the desired appearance and performance.

Needle punching

Manufacturing viscose needle-punched eye masks involves a process tailored to create a soft, comfortable, and effective product. It is simplified overview of the manufacturing process:

1. **Viscose Fibre Preparation:** Viscose fibres, derived from natural sources like wood pulp or cotton, are prepared by cleaning, carding, and sometimes blending with other fibres to achieve desired characteristics such as softness and absorbency.
2. **Web Formation:** The prepared viscose fibres are laid out in a loose web or batt. This can be done using methods like air laying or carding, forming a fluffy layer of fibres.

3. **Needle Punching:** The web of viscose fibres passes through a needle-punching machine. This machine has a bed of barbed needles that repeatedly penetrate the web, entangling and interlocking the fibres to create a cohesive fabric structure.
4. **Cutting and Shaping:** After needle punching, the fabric is cut into the desired shape and size for eye masks. This can be done using die-cutting or other cutting methods to ensure uniformity and precision.
5. **Finishing:** The eye masks may undergo additional finishing processes to enhance their properties or aesthetics. This can include treatments such as heat setting, embossing, or applying surface coatings for added softness or moisture-wicking properties.

Spreading the vetiver powder process

To spread vetiver powder on a core layer of viscose fibre, you'll want to follow these steps:

Prepare the Viscose Fibre Core Layer: Lay out the viscose fibre in the desired shape or form.

Apply Vetiver Powder: Sprinkle or spread the vetiver powder evenly over the surface of the viscose fibre. Make sure to cover the entire area that you want to treat.

Press or Set the Powder: Depending on the specific application, this process may need to press the vetiver powder into the viscose fibre to ensure it adheres properly. This can be done using a press or by simply applying pressure with your hands.

Allow Time for Absorption: Give the vetiver powder some time to be absorbed by the viscose fibre. This will vary depending on the specific materials and environmental conditions, but generally, a few minutes to an hour should be sufficient.



Fig. 1 Coating Process

Finalize and Use as Needed: Once the vetiver powder has been properly applied and absorbed, viscose fibre with vetiver treatment is ready for use. This can incorporate it into various products or applications as needed.

CONSTRUCT THE FINISHED FABRIC INTO EYEMASK

Prepare the Fabric Layers: Cut out the required sizes of black cotton fabric for the top layer, white cotton fabric for the bottom layer, and the viscose and vetiver powder-filled core layer.

Layer Assembly: Place the black cotton fabric face down on a flat surface, followed by the core layer (viscose and vetiver powder), and then the white cotton fabric on top, face up. Align all the edges carefully.

Pinning: Use straight pins to secure the layers together along the edges. This helps prevent shifting during sewing.

Stitching: Starting from one side, sew along the edges of the layers using a sewing machine or hand stitching, leaving a small opening for turning the mask inside out.

Turn Inside Out: Carefully turn the mask inside out through the opening, gently pushing out the corners to ensure they are fully formed.

Final Pressing: Press the eye mask with an iron on a low setting to smooth out any wrinkles and creases.

Final Inspection: Check the eye mask for any loose threads or imperfections, and make any necessary adjustments. And there you have it, a step-by-step guide to sewing an eye mask with a core layer of viscose and vetiver powder, sandwiched between black and white cotton fabric layers.

CHEMICAL TEST:

Chemical tests for fabrics typically involve assessing their reaction to various chemicals, such as acids, bases, solvents, and dyes. These tests can determine the composition of the fabric, its potential reactions to common substances, and its suitability for specific applications

PH VALUE TEST

pH value test for fabrics is used to determine the acidity or alkalinity of the fabric. This test helps in assessing whether the fabric is pH-neutral, acidic, or alkaline, which can affect its compatibility with certain dyes, finishes, or applications.

LIQUID ABSORPTIVE CAPACITY

Liquid absorbency capacity refers to the ability of a fabric to absorb liquid. It's measured by determining the amount of liquid a fabric can take in before becoming saturated. This property is crucial in determining the fabric's suitability for various applications, such as towels needing high absorbency or waterproof fabrics needing low absorbency.

RESULTS AND DISCUSSION

CONSTRUCT THE FINISHED FABRIC INTO EYE MASK:

The core layer is made of viscose and vetiver powder for added comfort and scent, sandwiched between black cotton fabric on top and white cotton fabric on the bottom.

Prepare the Fabric Layers :

Cut out the required sizes of black cotton fabric for the top layer, white cotton fabric for the bottom layer, and the viscose and vetiver powder-filled core layer.

Layer Assembly:

Place the black cotton fabric face down on a flat surface, followed by the core layer (viscose and vetiver powder), and then the white cotton fabric on top, face up. Align all the edges carefully.

Pinning:

Use straight pins to secure the layers together along the edges. This helps prevent shifting during sewing.

Stitching:

Starting from one side, sew along the edges of the layers using a sewing machine or hand stitching, leaving a small opening for turning the mask inside out.

Trim Excess Fabric:

Trim any excess fabric and trim corners diagonally to reduce bulkiness.

Turn Inside Out:

Carefully turn the mask inside out through the opening, gently pushing out the corners to ensure they are fully formed.

Closing Opening:

Fold the edges of the opening inwards and either hand stitch or use a sewing machine to close it neatly. You can use a blind stitch or a slip stitch for an invisible closure.

Final Pressing:

Press the eye mask with an iron on a low setting to smooth out any wrinkles and creases.



Final product

PH value test

pH Values	Eye Mask
Mean pH Value	6.3
pH of extracting solution	5.83

Standard : IS 1390 : 2022 Test Solution Used : 0.1 M Potassium Chloride Solution.

Liquid absorptive capacity test

Liquid Absorptive Capacity	Described by the Customer : Eye Mask
Dimensions of test pieces	Length:100 mm X Width: 100 mm
Type of test liquid used	Distilled water
Average liquid absorptive capacity in %	1161.67%
Standard deviation	48.58

DISCUSSION

The development and testing of the vetiver-based eye mask. Start by introducing the motivation behind using vetiver as a finishing material, highlighting its potential benefits such as its natural fragrance and antimicrobial properties. Explain how the eye mask was constructed, with a core layer of viscous fibre for structural support and top and bottom layers made of cotton for comfort. Next, discuss the methodology used to test the eye mask. Explain the rationale behind conducting pH tests to ensure the material is safe for use on the skin, as well as liquid absorptive capacity tests to assess its functionality. Describe the procedures followed for each test and how the results were analyzed. Following the methodology section, present the results of the tests. Discuss how the eyemask performed in terms of pH levels and liquid absorptive capacity. Interpret the findings and compare them to relevant standards or previous research if available.

SUMMARY AND CONCLUSION

Eyestrain is a condition that occurs when your eyes get tired from intense use, such as while driving long Distances or staring at computer screens and other digital devices .It is becoming a more common condition in This digital age among all age group of people. Mainly two sectors of people are affected due to this eyestrain More frequently; drivers and software engineers. Being continuously exposed to bright light or glare, they Suffer from eyestrain and sleep disturbances and sleep deprivation adds to many health problems. To reduce These symptoms and to give relaxation to eyes, a cool eye mask using vetiver powder, is Developed. The development eye mask helps in relaxing the veins around the eyes, and thus giving a soothing feel. This vetiver powder is used to treat sore eyes due to extreme heat in eyes in Ayurvedic treatment. The cotton materials used in the eye mask will be comfortable for wearing.

REFERENCE

- Satya Prakash Singh, Satish Kumar Sharma, Tanuja Singh, Lalit Singh (2013). Review on *Vetiveria zizanioides*: a medicinal herb. *J Drug Dis Ther* 1(7): 80-83.
- R.R. Rao, M.R. Suseela (1989). National Botanical Research Institute Lucknow, India,

Vetiveria zizanioides, 439-442.

- Crystallinity changes in lyocell and viscose-type fibres by caustic treatment
- Bange MP, Caton SJ, Milroy SP (2008) Managing yields of high fruit retention in transgenic cotton (*Gossypium hirsutum* L.) using sowing date. *Aust J Agric Res* 59:733–741
- Lal R.K, Sharma JR and Misra HO (1997) Genetic diversity in germplasm of vetiver grass, *Vetiveria zizanioides* (L.) Nash. *Herbs, Spices Medicinal Plants* 5 : 77-84.

