Woven Textile Moisture Sensor for Enuresis Alarm System

Inese Parkova, Aleksandrs Vališevskis, Marianna Grecka and Ausma Viļumsone Institute of Textile Materials Technology and Design, Riga Technical University, Latvia inese.parkova@rtu.lv

Woven textile sensor was developed for nocturnal enuresis alarm system, what is provided to use in biomedical clothing.

INTRODUCTION

Nocturnal enuresis or bed-wetting is intermittent incontinence during sleep of children after age of 5 years [1]. It is condition which is related with psychosocial consequences and may precipitate wide range of behavioral and developmental problems and decreased quality of life. One of the non-pharmacological treatment methods is the use of a bed-wetting alarm system. The alarm awakens the child when bed-wetting starts, the child gets out of bed and finishes voiding in the toilet. With time a successful therapy results in a child learning to wake up by himself, when his bladder is full. Child's involvement and a desire to solve the issue are important for this therapy. Therefore it is important to make the system more convenient, so its use shouldn't disturb child and avoid psychological barrier to therapy. Existing nocturnal enuresis alarm systems are mostly rigid and inflexible, therefore it is not comfortable enough to use.

The aim of this research is to develop comfortable and safe to wear smart clothing system prototype for nocturnal enuresis treatment. To improve comfort conditions of the system, modular humidity sensor should be replaced by textile sensor, solid electronics components should be replaced by flexible electronics parts and system connections should be integrated into clothing.

EXPERIMENTAL METHODS

After analysis of existing nocturnal enuresis alarm systems [2] woven textile sensor was developed what consists of insulating and conductive textile yarns. Sensor configuration and system circuitry is shown in Figure 1.



Fig. 1 Sensor configuration and system circuitry

RESULTS AND DISCUSSION

Sensor samples were analyzed and evaluated by signal detection speed, material consumption, results of performance tests (wash and wear), manufacturing ease, comfort, etc.

Developed and tested connection technology of sensor and alarm unit.

CONCLUSION

Design of textile moisture sensor and results of tests are important for future biomedical smart clothing development. Sensor should conform with wearing comfort conditions as well as it should effectively carry out its functions.

REFERENCES

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