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Sudan University of science and technology
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**Anew design for the sley mechanism of
a weaving machine(theoretical study)**

تصميم جديد لآلية الدف في ماكينة النسيج (دراسة نظرية)

A thesis submitted as a partial fulfillment of the requirement for
the degree of Master of Science in textile engineering

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This study has been executed on a loom (picanol) at the textile department of the sudan university for science and technology.



آية

﴿ فَقُلْتُ اسْتَغْفِرُوا رَبَّكُمْ إِنَّهُ كَانَ غَفَّارًا ﴾ 10 ﴿ يُسِلُّ السَّمَاءَ
عَلَيْكُمْ مِدْرَارًا ﴾ 11 ﴿ وَيُنَزِّلُ الْأَمْوَالَ فِي بَيْنٍ وَيَجْعَلُ لَكُمْ
جَنَّاتٍ وَيَجْعَلُ لَكُمْ أَنْهَارًا ﴾

ABSTRACT

The sley of all existing weaving machines has a curvature movement. The curvature movement of the sley has so many disadvantages. The existed design of the sley gives high accelerations resulting in producing high noise levels as well as very little forces used for beating .Therefore high mechanical and electrical powers are needed for the existed design.

This work is the first approach to design a sley mechanism with a shoe at its bottom letting the sley to move in a linear movement rather than a curvature movement.

مستخلص

الدف لجميع آلات النسيج الموجودة لديه حركة في شكل منحنى . حركة الانحناء هذه لها العديد من العيوب. التصميم الموجود للدف يعطى تسارع عالي مما أدى إلى إنتاج مستويات عالية من الضجيج فضلا عن القليل جدا من القوى المستخدمة للضم . وبالتالي ارتفاع القدرات الميكانيكية والكهربائية اللازمة للتصميم الموجود.

هذا العمل هو النهج الأول لتصميم آلية الدف مع حذاء في أسفل الدف للسماح له للتحرك في حركة خطية بدلا من الحركة في منحنى.

تمت دراسة حركة الدف في شكل منحنى والعوامل التي تؤثر فيها وتوقيت النول وعمل برامج لكل الحركات (المسافة – السرعة – التسارع) باستخدام برنامج الماتلاب.

كما تمت أيضا دراسة إضافة حذاء أسفل الدف لتحويل الحركة إلى خطية ودراسة المعادلات للتصميم الجديد والمقارنة بينها وبين التصميم القديم.

خلصت هذه الدراسة إلى ان التصميم الجديد يزيد من الإنتاجية بالإضافة إلى تقليل الضوضاء داخل صالات مصانع النسيج وتقليل الطاقة المستهلكة .

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DEDICATION

This research is dedicated to my family. Thanks to them for their continuous support during my vital educational years.

To my daughters, who were the true inspiration behind this research. Without their little voices in my ears encouraging me to pursue this research, I wouldn't have completed this work. I guess I should thank them.

To the spirit of my mother that guided me and taught me that there is a light after the darkness.

To my husband, who was always there pushing me and encouraging me.

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“Thank You” this is the day to recognize and thank all the people who work tirelessly every day to help me.

* * * * *

Thank you my teacher for guiding me, inspiring me and making me what I am today.

* * * * *

Success is your blessing, my husband. I would always be thankful to you.

* * * * *

Thank you so much for helping me all through this work.