شبكة المعلومات الجامعية

بسم اللّه الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم باللّه العظيم أن المادة التي تم توثيقها وتسجيلها علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

Ain Shams University
Faculty of Engineering
Mechanical Power Engineering Department

Improving the performance of rolling printing machine by monitoring and analyzing mechatronics systems

A Thesis Submitted in Partial Fulfillment for the Requirements of the degree of master of science in mechanical Engineering

by
Haitham Abdel Monem Mostafa Badr
An engineer in the armed forces

Mohammed Abu Al-Aneen Al-Samnoudi
Professor
Mech. Power Engineering Dept.
Ain Shams University

Muhammad Ali Metwally
Assistant Professor
Mech. Power Engineering Dept.
the Military Technical College

Egypt , Cairo
2021

Curriculum Vitae

Name : Haitham Abdel Monem Mostafa Badr
Brith date : 29/4/1983
Degree :Bachelor's degree in Mechanical Engineering for the year 2005 from the Military Technical College
Current job : An engineer in the armed forces

Statement

This thesis is submitted in fractional satisfaction for the degree of master of science in mechanical power engineering to the faculty of engineering ain shams university .

The work remembered for this postulation was completed by the creatorprimarily at the laboratories of the mechanical power department faculty of engineering ain shams university .

no piece of this thesis has been submitted for a degree or capability at some other college .

Signature

Haitham Abdel Monem Mostafa Badr

Date : / /

Board of supervisors

The undersigned certify that they have read and recommended to the faculty of engineering ain shams university for acceptance a thesis entitled (Improving the performance of rolling printing machine by monitoring and analyzing mechatronics systems)submitted by Haitham Abdel Monem Mostafa Badr in fractional satisfaction for the necessities of the degree of master of science in mechanical engineering.

Supervisory Board:

1-Prof / Muhammad Abu Al-Enin Mahmoud Al-Samnoudi
Department of power mechanical engineering
Engineering Faculty, The university of Aen Shams

2- Assistant Professor / Mohamed Ali Metwally
Department of power mechanical engineering
Military Technical College

Date \ \

Examiners committee

the undersigned certify that they have read and recommended to the faculty of engineering ain shams university for acceptance a thesis entitled (Improving the performance of rolling printing machine by monitoring and analyzing mechatronics systems)submitted by Haitham Abdel Monem Mostafa Badr in fractional satisfaction for the necessities of the degree of master of science in mechanical engineering .

Supervisory Board:

1-Prof / Ibrahim Saleh Mustafa ( )

2-Prof / George Nubar Simonyan ( )

3-Prof / Muhammad Abu Al-Enin Mahmoud Al-Samnoudi ( )

4-Assistant Professor / Mohamed Ali Metwally ( )

Date 3\ 3 \2021

ABStRACT

The research is directed towards the work of modification and development of the poster printing machines that operate with Inkjet by increasing the speed of the poster printing machine without prejudice to the required print quality, which is the main factor in the market Because the quality of printing is the basis for the customer's drive and speed is an important factor for the printing organization in order to save time and provide the largest quantity of production with the highest quality, and through it. it will return to the printing establishment by several factors, namely:

1- Save time by producing the largest quantity in the least time.
2- Providing manpower for the printing establishment.
3- Providing the additional requirements to save electricity and other factors.

The purpose of this analysis effect of pressure inside the ink tanks on increasing the print accuracy (print quality) with the printer head steady. , Also to find what is the permissible critical range for increasing the pressure that will increase the speed of printing with permissible accuracy this phenomenon will be validated by :

1-Mathematical Model (Droplet Formation Model - Nozzle Dynamics Model) .
2- Coupling of Nozzle Dynamics and Droplet Formation .
3- prediction by CFD modelling .
4- Influence Of Pressure And Media Speed On Printing Quality.

It is possible to increase the production process for banner printing by fixing the machine speed at 5 m/h and increasing the pressure with a maximum of 0.38 bar because after that there was a clear defect in the printing process .
It can save time and increase production without compromising the quality of the printed product.
The prediction by CFD modelling was adequately able to predict the formation and development of an ink droplet ejected from the printhead of an inkjet printer.
Relationship between the different effect of pressure and the variable speed of the print head and their relationship to the print quality.
And we also find that it is possible to reach the maximum degree of printing accuracy after controlling the pressure and speed of the print head.
keywords :
poster printing machines- Inkjet - print quality - Printing heads - Continuous inkjet - Drop-on-demand .

Acknowledgment

I might want to offer my thanks to my scholarly advisorsProf/ Muhammad Abu Al-Enin Mahmoud Al-Samnoudi and Assistant Professor/Mohamed Ali Metwally for their direction and inspiration during this examination .

Iwould like to thank all the members of the renewable energy system simulation lab , I would like to express the deepest appreciation to my committee members for their inspirational instruction and guidance suppoeted by an engagement in comparative lierature and modern twchnology without thier guidance and persistent help icouldnot complete this dissertation.

Finally i sincerely thank my wife and my family and especially my parents deserve all the encouragement in carrying cut this work.

CONTENTS

LISt OF FIGURES