CHAPTER 1
INTRODUCTION

1.1. Background

Recently, many of manufacturing companies do not consider the environment of their production floor as an important factor. "Environmental issues have been linked to companies due to the fact that production and consumption activities are generating negative effect on the environment" (Garcia and Mainar, 2009). Moreover, because of the lack of appropriate system for environmental pollution control, "most of the textile industries in Europe make a rough estimation of the economic and environmental cost" (Metaxiotis, 2004).

One of the negative effects/pollution can be seen at the air in the production floor (Bridges et al. 2002), there are some unseen wastes produced by certain processes in manufacturing company such as dust (Combes and Warren, 2005). This situation can influence the quality of the product of the company. Say there are many dusts in the air at the production floor, like explained by Iqbal et al. (2011) and Hammad et al. (1998). This information shows that the level of dust in textile companies is high. If these dusts enter the yarn and make the yarn surface rough that reduces the quality of yarn, even worse when the yarn is used to make a cloth, the quality of cloth will decrease because the yarn is bad. "This situation can significantly influence to the customer decision" (Fliess et al. 2007), which means customer will not buy the product that results in the company loss of profit.

PT. Kusumaputra Santosa is a textile industry that produces yarn for supporting the cloth production at PT. Kusumahadi Santosa. This company produces four kinds of yarn; they are carded, combed, rayon, and spandex. Based on the interrelationship diagram this company's problem is that it cannot finish the production on as planned (Djatmiko, 2013). This condition is not good for the company because it will lose the profit. When the company cannot fulfill the demand from customer, the customer will not be satisfied and will not order to the company anymore. When a company faces that kind of problem, the production management, usually, just ask several workers to work overtime. However, this action is not benefitable, because the company should pay for additional cost for the workers who work overtime.

The late production happens because there is a bottleneck at the finishing work center. The bottleneck occurs since the production process at finishing work center takes too long. There are 14 winding machines at finishing work center which role is to move the yarn from a spindle to a cone. In the winding machine there is a cut detector, if the surface of yarn does not meet the standard, the cutter will cut the yarn. In the case where there are so many below standard yarn, that the surface of yarn is not aligned (Suwanti, 2013) the cutter at the winding machine should cut that yarn, and then the joiner should join the yarn again. This situation prolongs the production process, which is why bottleneck appears at the finishing work center.

Based on quality control data, there are so many non-standard yarn caused by dusts in the air at the spinning work center as these dusts enter the yarn and make the surface of the yarn is not aligned anymore because it becomes too thick. In this case, there are so many dusts in the air at the spinning work center because the dust cleaner machine does not work optimally. The problem is the part of the cleaner machine that is responsible of exhausting or absorbing the dust does not work optimally, that part is called Exhaust Arm. The hole to absorb the dust is just located at the bottom of the exhaust arm (near with the ground), while the dusts appear in the air, so the dust cannot be absorbed well by this machine. To solve this problem, an optimum cleaner machine is needed at the area of production floor especially at the spinning work center in order to decrease the volume of dust in the air that can hurt the standard of the yarn surface. Finally, this optimum cleaner machine can help prevent the company from losing the profit.

1.2. Problem Formulation

Based on research background described above, then the problem in this research can be stated as how to clean the air condition around spinning work center at PT Kusumaputra Santosa in order to reduce dust pollution produced by the spinning process.

1.3. Objectives

The goal of the research is to improve the dust cleaner machine to maximize the ability of absorbing the dust in the air around spinning work center.

1.4. Scope and Limitation

This research is conducted at PT Kusumaputra Santosa especially at the spinning work center. The research analyzes the causes of product (yarn) that does not meet the standard caused by dirty air. In order to make the discussion more specific, the research focuses in air pollution to analyze and measure the dust level in the air on spinning work center, after that starts to design appropriate exhaust arm in dust cleaner machine to absorb dust optimally.