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Development of Low Cost Dust Collector for Textile Industry

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Abstract

Cotton dust in the work place is major problem in cotton textile industries. This problem is more severe in spinning section. Dust consists of small and microscopic particles of various substances which are present as suspended particles in air. These particles are harmful to human health. Because of this various diseases are occurred like shortness of breath, cough, and lungs cancer. Various aspects of health hazards in textile industries have been discussed and measure hazards is lungs cancer to reduce this health hazards is lungs cancer our dust collector is helpful.

Keywords health hazard, cotton, occupational hazards

Introduction

The textile industries in India traditionally after agriculture, is the only industry that has generated huge employment for both skilled and unskilled labor in textiles. It is the second largest employment generating sector in India. It offers direct employment to over 35 million in the country. The share of textiles in total exports was 11.04% during April-July 2010 as per ministry of textiles. In 2010 there were 2500 textile weaving factories and 4135 textile finishing factories in all over the India. So most of workers worked in textile industries worker faces occupational hazards, health hazards. According to survey not only workers but also all family members who lived with him. We have also visited **Vivek Textile Industry** situated in Akkalkot road, MIDC, Solapur. We have also collected the sample dust for study of its various physical properties. There was no any provision for collection of dust at all and also visit ravels that many workers are facing respiratory problems like asthma, cough etc. Other facts observed during studies are as follows:

1. Most workers are suffered from headache, shortness of breath, cough.
2. And some people suffer from lungs cancer so our sample study made clear that the workers faces health hazards, occupational hazards. So that they can take precautionary method by using various options available in the market like masks, scuffs, additional cleaning equipments like vacuum cleaner and dust collectors.

Proposed Solution

As to resolve this problem as stated above possible solutions like masks, scuffs, additional cleaning equipments like vacuum cleaner and dust collectors. There are some problems associated with every solution for example in case of mask worker cannot wear it for whole duty time; also each worker has to carry a separate mask. It also makes difficulty while communication among the workers. Additional cleaning equipments like vacuum cleaner adds cost to the industry, again the running cost and requirement of electricity is another problem. Adjust collectors available in market are having high cost which cannot be afforded by small scale industries. Most of industries located in Solapur are small scale. So the solution is development of new low cost dust collector which is manufactured with locally available material which can be afforded by small scale industries. We know in developing countries like India we are continuously facing health issues due to lack of literacy and poverty. Most of workers from textile industry are not covered by any health insurance. For this our efforts are to develop cheapest, low maintenance dust collector for textile industry.

Proposed construction of dust collector

The newly developed dust collector consist of two buckets, funnel shaped baffle, exhaust fan, pipe joiner, 90 degree elbow fitting, filters, bolts, nuts, and washers etc. which is easily available in local market. Here two buckets are joined by heating process by mounting one on another, a funnel shaped baffle manufactured from MS foil Sheet is kept inside buckets. An exhaust fan is fixed at the bottom of assembly. Above fan a filter is placed through which a air is passed and the dust is traped and the exhaust of this fan is again left into room through the filter so double cleaning is achieved. Also when the dusty air enters into assembly it comes through 90^0elbow which are fixed on the top of the assembly. By making provision of wheels at the bottom of assembly we can make it portable.

Figure 1: Top part of Dust Collector

Figure 2: Bottom part of Dust Collector

Working of dust collector

From the fig. it can be observed that there is inlet, through which dusty air particles comes into by passing through 90 degree elbow. Due to placement of exhaust fan partial pressure drop occurs in the bucket due to which dusty air suck into the assembly and while entering into the assembly through the elbow the direction changes which makes loss of inertia of dust particles and these dust particles drop down in the bottom of the assembly. There is provision of taking out the collected dust. Due to funnel shaped baffles direction of flowing air changes. This way we got purified air out.

Conclusion

The available dust collector in the market at present is up to range of Rs.25000-150000**.** Our Dust collector manufactured by using locally available which costs around Rs. 4000-5500. Another benefit is clean air made available at work space. Which reduces health problems among the textile worker, consequently life span of workers increases? Our designed dust collector effective for 10 Sq feet area for larger area larger dimensions will require. Another advantage is it is compact in size as compared to models available in the market

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