International Journal of Technical Research and Applications e-ISSN: 2320-8163,
www.ijtra.com Special Issue 19 (June, 2015), PP. 10-11

LOW COST DUST COLLECTOR FOR SMALL SCALE TEXTILE INDUSTRY (SSTI)

Dhende M.M.
Department of Mechanical Engineering,
Bramhadevadada Mane Institute of Technology, Solapur, India.

Abstract- In India there are many small scale textile industries. Cotton dust in the work place is major problem in SSTI. 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. To reduce this health hazards, there a need of dust collector. If we developed a low cost dust collector for SSTI.
Keywords health hazard, cotton, occupational hazards.

I. INTRODUCTION

The textile industries in India are the only industry that has generated huge employment for both skilled and unskilled laborin 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 are facing occupational hazards, health hazards. According to survey not only workers but also all family members who lived with him as face the same problems. The dust from the textile factory includes small and microscopic particles of various substances which are suspended in air. In small scale textile industry (SSTI) there no any provision for collection of these dust particles. The workers in these industries are facing respiratory problems like asthma, cough etc. most of workers are suffered from headache, shortness of breath, cough. 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 help of precautionary method by using various options available in the market 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 can not 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. Adust collectors available in market are having high cost which can not be afforded by small scale industries. In this paper design of new low cost dust collector for small scale textile industries is developed. 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 effoerts are to develop cheapest, low maintenance dust collector for textile industry.

II. DESIGN AND CONSTRUCTION DETAILS

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: Middle part of Dust Collector

III. WORKING OF DUST COLLECTOR

From the fig. it can be observed thatthere 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.

IV. CONCLUSION

The available dust collector in the market at present is up to range of Rs.25000-150000**.**Our Dust collector manufactured by usinglocally 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

REFERENCES

[1]. Europe agency for safety and health at work, "occupational safety and health in the textiles sector"

[2]. B.M Sangeeta including all, Department of environmental engg, park college of technology, Coimbatore. "Cotton dust level in textile industries and its impact on human", international journal of scientific and research publications, volume 3, issue4, April 2013

[3]. Grizzly industrial, "cyclone dust collectors", copyright April 2013 by grizzly industrial, INC. united states

[4]. C.D Kane, textile and engginstitute,rajwada,ichalkaranji 416115, India, "environmental and health hazards in spinning industry and their control," Indian journal of fiber and textile research

[5]. Dr. Ajeetjaiswal, Ph.D. assistant professor, department of anthropology, Pondicherry university, " a study of the breathing problems among silk industry workers in india", puducherry-605014, india

[6]. A.buekens and K.schroyens , department of chemical engg.-CHIS 2, " Dust collection", vrije university brussel, Belgium

[7]. "Collecting and filtering dust" , American fabric filter co.2003 (800) 367-3591, fax (813) 991-9700