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REVIEW PAPER IN EXPERIMENTAL EVALUATION ON DESIGN AND DEVELOPMENT OF SOLAR CLOTH DRYER

Sushant Ranjan[1], Jitendra Raghuvanshi[2]
M.tech scholar[1] , Asst. Professor LNCT, Bhopal[2]
lnctsushantranjan@gmail.com, Jitendralnct@rediffmail.com

Abstract- The solar cloth dryer was made in with the help of available materials. the efficiency was investigated with how to fast it was able to dry up the clothes .Hence a set of experiments were performed to determine the worthiness of this solar dryer .The experiments shows that the dryer work are fine as per its objectives. The main advantage of this dryer it can work in auxiliary heating system all-round the year with a built up .and there are no with moving parts, a conventional dryer in washing machine it consumes less power than conventional dryers .It can easily be built with commonly available materials. The manuscripts re-present the design and efficient energy construction, time saving, effective cost of passive solar power cloth dryer. a derivation of mathematical model are represent the analysis of the elements necessary for successfully design for various component of solar cloth dryer. the solar drying performed an average drying rate of 0.35kg/h and drying time of 3 h in a mill day, since under low ambient humidity approximately 35%.the efficiency are improved in solar dryer uses Nano coating technology. additionally, the computational liquid element (CFD) are the transient warm conduct in light of Navies-strokes with mathematically statement are utilized that shoe that overarching temperature in the sun based ventilation are connected with the interior warmer flux because of sun radiation dampness evacuation. For this frame work outcome demonstrated great assertion between the computational reproductions and tested are effective results are showed incredible assertion between effective computational solid multiplication and effective test are procedure from these systems.

Keywords:-. Solar drying, sun drying, Clothing, drying rate, rate of falling, change in climate, food ingredients.

1.INTRODUCTION

Renewable energy technology is with being eco-friendly, bridges the gap between mounting global energy demand are supply of finite conventional energy. Efficiency and economics of installing such an application cannot be ignored. The two factors that must be essentially looked into are the effectiveness and financial of installing such an application. Solar energy has an enormous source for potential for different application since it is easily acceptable.

Solar technologies are in large scale either passive solar or active solar depending on they capture, convert and distribute sunlight techniques the use of photovoltaic panels , solar thermal collectors, with electrical or mechanical equipment are convert sunlight into usable from of electricity, in active solar technology. Where as Passive solar techniques include sun light without active in mechanical systems. These technology converted sun light to usable heat such as water air and thermal mass and designing spaces that spaces naturally circulate air. The solar radiation potential capability of india 4.7 kW/m2/day. Solar energy can be used for variety purposes uses such as heating, drying, cooking, electricity. Since india various utilization and temperature climate zone of world, sun light is the most powerful for a major part of the year. In solar energy from the sun is converted into the thermal energy solar thermal technology are designed and developed to convert the incident solar radiation into useful heat. the process of solar heat conversion implies that using collectors –the specially designed mentors lenses, heat exchangers, which can concentrate the radiant solar energy from the sun and transfer it to a circulated fluid. There are various forms of technology are use solar thermal applications. They are energy conversion devices, central heating, cooking, drying and refrigeration .Drying is a most essential operation in any industrial process and daily need, requirement. A drying cycle has controlled to decreasing the temperature humidity which can avoid the remove the moisture. Shrinkage and working of garments Drying is a essential operation in any industrial process and daily needs, requirement such as cloths, food vegetables. Drying of clothes is a daily operation. in situations and places like hostels and hospitals, this process of work does not effectively. If there is considerable less sunlight, humidity rainy season, dark places, drying of clothes on a large scale when quick drying is needed. Hence, conventional dryers are use and prove the energy consumption and less efficient in these situations. In the drying of washing machines, cases, clothes move in circular path and act centrifugal forces are act into account. The region water is remove from clothes outward the circular path and clothes gets dry.

2. LITERATURE REVIEW

Pandey et al. (2016) these analyses show the effective blueprint and headway of effective impression profit, effective, useful of disconnected sun arranged the energized pieces of clothing dryer. This duplicate key words are with an incitement of numerical model addresses of sun arranged by dryer brought after with an examination of effective segments basic as long as viably arranging effective distinctive parts of daylight based dryer sun are arranged effective drying execution achieved in a regular

day ordinary drying rate of 0.35 kg/h and drying time of 3 h, under the neighbourhood the low incorporating clamminess are around 35% and at moderate outside wind speed. More effective, computational fluid component CFD of transient are more effective and warm direct in light of Navies-Stokes numerical articulations was used to demonstrate effective overall temperature rises in effective sun based typical ventilation system.

H.K. et al. Preservation of food As drying is one of the preventing methods, the solar food or crop dryers are convenient drying methods for a visible world. In this type of study, a forced convection solar crop dryer is designed and constructed to dry different crops.

Sontakke and Salve - Solar drying is one of the application of solar energy. Drying means remove of moisture from the product. It preserves the food product for long time; it prevent product from contamination. The various solar drying method these are direct solar drying, indirect solar drying, and mixed mode solar drying.

Shivkumara and swamy when two fluids at in the different temperature are mixed, a spatial and time temperature flection are occurs. If the flectional is high, it damage to structure in due to high cycle thermal failure of materials are called stripping phenomena. The computational fluid dynamic are reduce to number of experiment required.

KEYWORDS: Thermal stripping phenomenon CFD Process

4. METHODOLOGY

The drying process removes the moisture. The disadvantages of open with drying are that dust and get embedded into the clothes. And when the no sunlight and considerable humidity are considered, the drying takes a longer time. The dryers in washing machines, but they dry in centrifugal action are required and not able to perfectly dry the clothes. With a solar dryer, drying is done quickly , the drawback are eliminating exist in drying methods.in the winter session when the scarce sunlight in the dryer can performed by switching on the auxiliary heating forced convection system, with a minimum loss of energy. Objectives → To a model of fabricate solar cloth dryer.→ to provide a effective cost of solar direct heating system for drying of clothes purpose → To provide a suitable dryer which uses the green energy that can replace the electricity to consuming dryers.

Fig 6.3 Operation of the dryer

5. RESULT AND DISCUSSION

RESULT : After the assembling of solar dryer, a set of experiments were performed under the test and its efficacy. The experiments are carried

out on days of bright sun and inside the room to simulate in non-sunny day. Five T-shirts are used for testing subjects, after another adding up and variations are seen. The following parameters are studied and graph are plotted in during the experimentation of the dryer.

Discussion - 7.1 No. of Clothes Vs. time(minutes) taken for Drying with Solar Radiation

S. No.	No. of clothes	time taken	No. of clothes
1	1	0	17
2	2	10	20.2
3	3	20	24.4
4	4	30	29
5	5	40	33.7

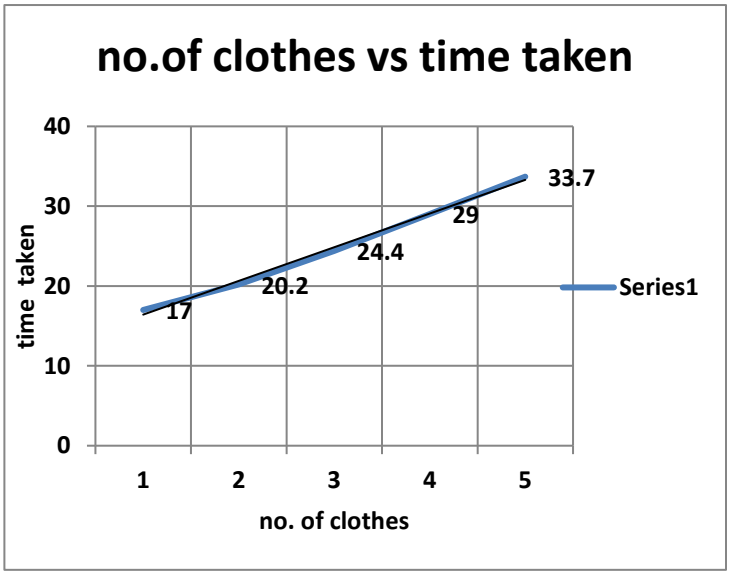

Fig.7.1

in Fig. 7.1, the time are taken to dry up for each part of the experimentation increases in the almost linear trend. The times are taken for the clothes are to dry up is a linear function of the number of clothes used. That is noted that the slope of the curve for the second step to the last is greater than of the first to the second. It may be attributed to increase the local humidity during the experimentation and the distribution of heat among the other clothes. The temperature reading inside the chamber is observed as 52ºC. increased drying time are more clothes inside the chamber.

REFERENCES

1. Non-conventional energy source-G D Rai , Khanna Publishers
2. Solar energy-Sukhatme , Tata Mcgrawhill

3. Dheeraj singh kirar , Rohit Pandey ,Design and Development , International journal of Engineering Research in Mechanical Engineering(IJERMCE).
4. Jagadish Hungund, Anandkumar S Mali Patil , Dump Diffuser using CFD. International journal of Research in applied science and Engineering Technology (IJRASET); 2017
5. Norton, Brian the harnessing solar heat (2013)ISBN 978-94-007-7275-5.
6. Ekechukwu, O.V., Review Of Solar Energy Drying Systems (1999); 40(6): 593-613