



PORTABLE, MULTI-PURPOSE ELECTRICAL DRYER

AN AID TO YEAR ROUND DRY FISH PRODUCTION

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Our country is a country that ranks third in global fish production. The Indian peninsula is bestowed with marine fish production of 3.58 million tonnes, of which Kerala's share is around 20%. On contrary to these bountiful resources, quality demands of the consumer are seldom met in terms of availability of fish. Post-harvest losses in fisheries accounts to 18%, which stands as a major factor to this scenario. Associated Chambers of Commerce and Industry of India (Assocham) reported that there is an annual loss of over Rs 15,000 crore to India's marine and inland fisheries

sector due to the poor post-harvest handling of fishes. Also, these losses results in potential income deprivation to fishermen community and all the stakeholders involved in fisheries sector.

Therefore, minimising post-harvest losses is of great concern in terms of assuring increased revenues and accomplishing food security. Spoilage of fish starts at an early stage soon after it dies and so processing measures needs to be executed immediately (Peter and Ann, 1992). Improved processing measures involving cold storage lines during storage and transportation, drying and value addition offers solution to this. Thus technological advances in the drying arena can be a fruitful solution for fishermen as well as entrepreneurs working in fisheries sector.

Drying is an important processing operation that preserves fish by arresting microbial growth, inactivating enzymes and other chemical reactions

by removal of moisture from the fish (Duan et al., 2004). It is a combined heat and mass transfer process through which moisture content of products are brought down to predetermined levels for safe storage (Hall et al., 1980). Open air sun drying is an age old practice adopted by fisher folk to preserve fish and fishery products, thereby combat seasonal glut and fluctuating market prices. Although this practice is inexpensive, quality of dried products are inferior due to unhygienic handling. The method relies solely on availability of solar radiation; moreover losses caused by predators are dominant. Even though innumerable dryers are available for fishes commercially, cost is one of the major constraints that prevent the fishermen from adopting it. Thus a low cost, multi-purpose, portable type electrical dryer is designed and developed to use it in micro and small scale fish processing units, household and laboratories for in-house drying of fishes and other agro products.

Marine plywood which can withstand humid and wet conditions is used for the fabrication of dryer body. The dryer is designed to dry 10 kg of fish in one batch. The dryer assembly comprises of

a base frame, fan housing, two heating coils of 1.5 kW each, drying chamber with ten stainless steel trays stacked one over the other and an exit for exhaust air.

The ambient air is forced into the dryer by a blower located at the bottom which in turn gets heated by two electrical coils of 1500 W each. The resulting hot air passes through the drying chamber across the material to be dried. Product to be dried is placed on Stainless steel wire mesh trays with aluminium frames. The drying time required is around 6-7 hours for fishes and the maximum temperature attainable in the drying chamber is 50 ± 0.5 °C.

One of the problems faced during fish drying is regarding the uniformity of temperature distribution within the dryer. Often non-uniform conveyance of temperature promotes cooking of fishes rather than drying. Hence, care is taken to maintain the temperature within the dryer in the required range. Also, the unique exhaust design will help to eliminate bad odours and an auto cut-off system will ensure minimum human supervision with good quality drying. The dryer can be used

for drying of other agricultural commodities as well. Further, year round operation of the dryer can make fishermen rely on this as a consistent source of income generation.

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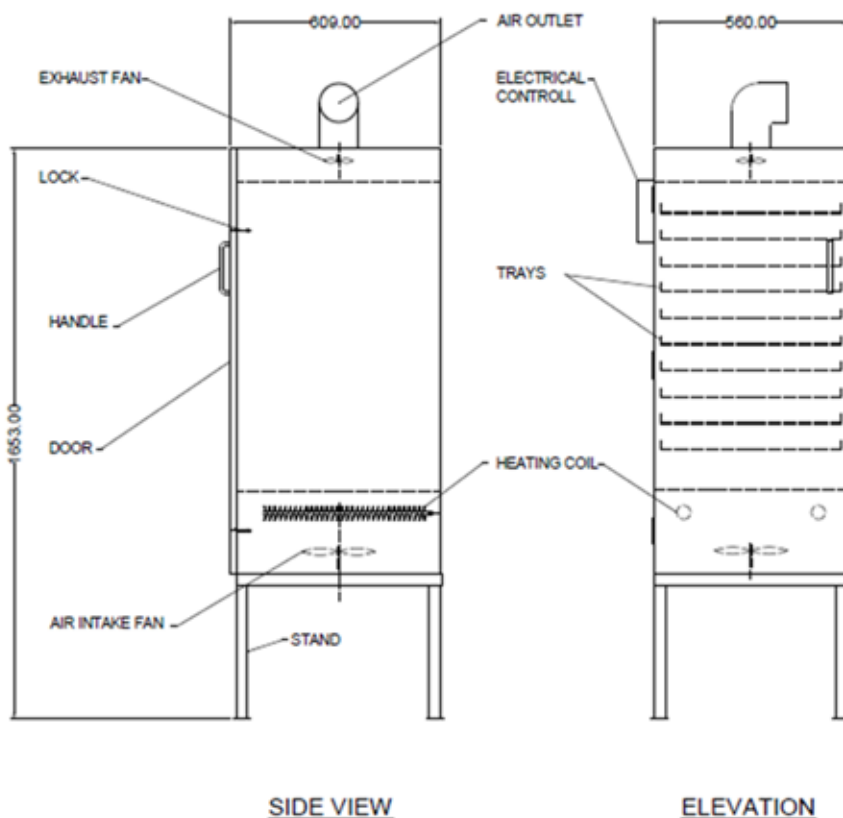


Fig.1. ICAR-CIFT Portable-multipurpose-electrical dryer