

A MECHANISED PEELING TABLE FOR PRAWN PROCESSING FACTORIES

The conventional method of hand peeling of prawns in fish processing factories is often time consuming and laborious. Peeling is done batchwise on contract basis

and payment is made on the number of batches that one can turn out in a day. Here raw material as well as waste are to be handled manually. Depending on the

length of the peeling shed, the distance of waste disposal bin and amount of work load, considerable time is wasted on the handling of materials. Delay caused due to handling also affects the quality of raw material and the finished product. To save time and to improve the peeling operation, a prototype mechanised peeling table was designed and operated successfully.

The table consists essentially of two belt conveyors for carrying whole prawns and waste material to and from the individual peeler continuously. The main structural frame work of the table (fig.1) is made out of 50 mm standard angle iron with table top of wooden plank covered with aluminium-magnesium sheet. The two belt conveyors (upper and lower) are supported in four rollers: two drive rollers and two idlers. The drive rollers are driven by a geared motor through sprocket wheel and chain drive system so as to run the two conveyors at different speeds, the lower one being faster than the upper one. All the four rollers are supported on self lubricating ball bearings. There are several support rollers for the conveyors which operate on ball point bearings for free rotation. Raw material charging hopper at the inlet end of the upper belt is fitted with a self proportionating impeller driven by the same drive mechanism which discharges a required quantity of material on the upper conveyor so that no unpeeled material is left out on the conveyor when it reaches the discharge end. Suitable discharge hoppers are fitted at the other end of the conveyors to collect waste prawn and waste material separately. On the working platform, three discharge channels are fitted terminating on to the lower conveyor for the discharge of waste material. The specifications of the table are as follows:

Dimensions: 180 cm L x 75 cm B x 90 cm H.
Working platform per head: 45 cm x 60 cm
Width of conveyor belt : 30 cm each.
Speed of upper belt : 30 cm/min
Speed of lower belt : 60 ,,
Capacity of charging : 30-35 kg/hr.
hopper.
H.P. of the geared motor : 2
Approx. cost of table : Rs. 3000/-

The operation of the table is very simple. It can be started by switching on the geared motor when both the conveyors and feeder start moving. Material from the hopper is delivered to the individual worker by the upper conveyor. Workers standing on the side of the table can pick up prawns according to their liking from the moving belt, peel and discharge the waste to the waste channels and meat into the bucket provided. The waste is automatically removed to the waste disposal bin by the lower conveyor continuously and undersize prawns left on the upper conveyor may be collected or allowed to go to the waste bin. At the end of a day's operation, the table top and conveyors can be washed well with spray of water.

In this prototype table, though the working platform is provided only on one side, in industrial types platforms can be provided on either side so as to accommodate larger number of workers. The length of the table can be increased considerably depending on the length of the peeling shed.

For conducting field trials and studying the efficiency of the mechanised peeling table over the conventional method, it was taken to a nearby peeling shed of size 60m in length and 20m in breadth, with waste disposal bin situated at a distance of 20m away from one end of the shed. The time saved by using the mechanised table compared to the conventional method for peeling 5 kg of prawns was as follows:

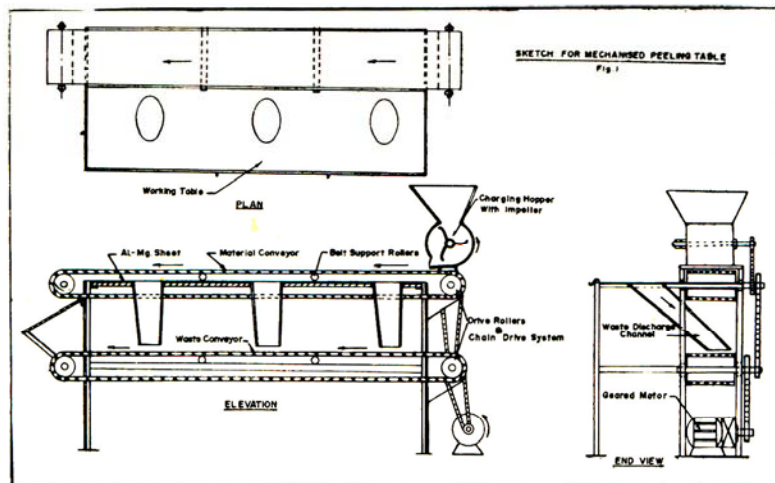
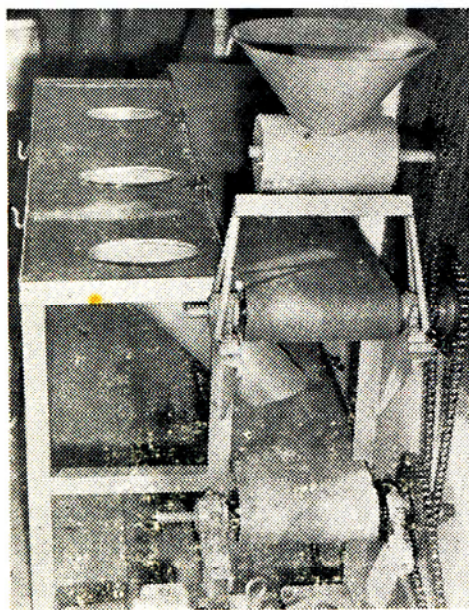


Fig 1



estimate of the economics of the prototype table was worked out on the basis of the time saved. Even after accounting for electricity charges, there was a net gain of about 60 paise per worker per 8 hours for the factory owner, even though the peeling process as such is not automatic.

The advantages of the mechanised peeling table over conventional method are (i) Raw material flow is regular and uniform and discharge of the waste material is automatic (2) Bacterial contamination is much less compared to that in conventional method because of easy cleaning of metallic top and rubber coated conveyors (3) Hand peeling and size grading can be done simultaneously resulting in additional gain for the factory owner and increase in processing capacity of the plant and (4) Due to stream-lining of the entire peeling operation, effective quality control measures can be successfully adopted.

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Waiting time	=	5 min.
Supply time	=	2 „
Time for discharging the waste	=	3 „
Total	=	10 „

This worked out to a saving of about 33 man hours per ton of material. An

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