

A Winding Machine for "Sekiyama"*

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During 1964, the Offshore Fishing Station, Cochin, took up a programme of exploratory Tuna Fishing in the deeper waters off Cochin. M.F.V. PRATAP, a side trawler was converted into a Tuna Long Liner for this purpose. The equipments specially required for this type of fishing were procured and installed under the guidance of Mr. K. Kawaguchi, F. A. O. Expert. About 90% of the gear and implements were either fabricated, or obtained from this country out of which about 80% were procured locally. One of such items was SEKIYAMA*

Sekiyama is an important part in tuna long lines. Suitable wire ropes required for this were not readily available in the market. So this item was fabricated at the Station. Good quality wires were purchased and were stranded. No. 27 wire was used and the rope 1.7 m.m. dia. consisted of three strands of three ply each. After stranding, the wire was wound by twine to turn it into 'Sekiyama'. Over this, No. 20s/3x5 cotton twine (0.8 mm.) was wound using the winding machine. The stranding and winding machines were fabricated in the workshop attached to the Station.

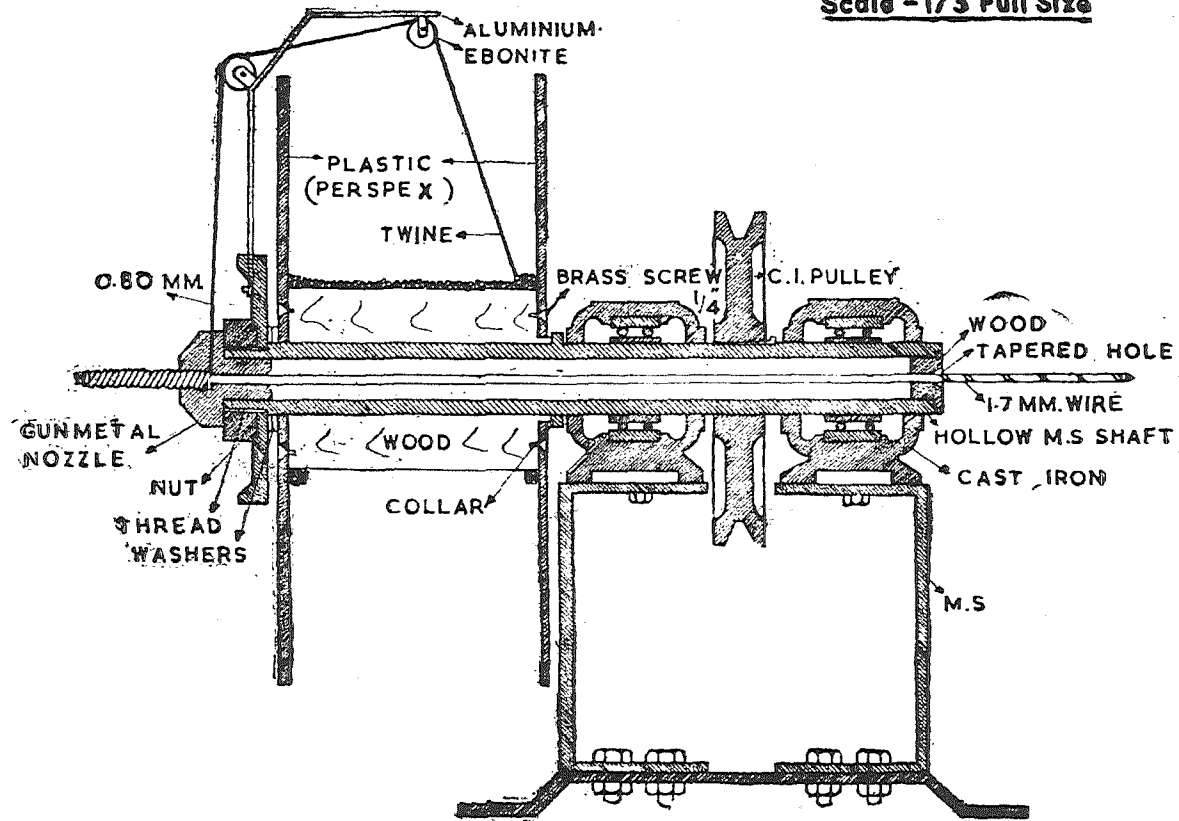
The winding machine consists of a hollow shaft (mild steel) which runs freely on two self-aligning ball-bearings fixed on a mild steel supporting frame. (Ref. Fig.) A light spool carrying tightly wound twine, runs free on the shaft at one end. A cast iron pulley is fixed to this shaft between the two bearings. An arm, made of aluminium, and fixed on an aluminium hub plate rotates with the shaft, guiding the twine from the spool to a gun metal nozzle. The arm carries ebonite rollers over which the twine passes. The aluminium hub plate is properly balanced with respect to the weight of the arm. A check-nut is provided to lock the hub plate against the spool after placing two thrust-washers between the hub plate and the spool. A nozzle, as shown in the figure, is placed at the end of the shaft. The wire rope is fed from the other end of the hollow shaft and passes through its entire length and then through the nozzle. The twine passes from the spool through the rollers to the nozzle and then through a transverse hole provided at the neck of the nozzle.

The pulley is driven by a motor with a single V-belt. After the thrust-washer is adjusted properly by the check-nut, the spool releases a length of twine per revolution of the shaft which is just sufficient to wind one loop over the wire. If the thrust is too little, the feed is too much and the loose twine gets inter-locked and knotted over the guide arm. If on the other hand, the thrust is too much, the twine gets elongated by

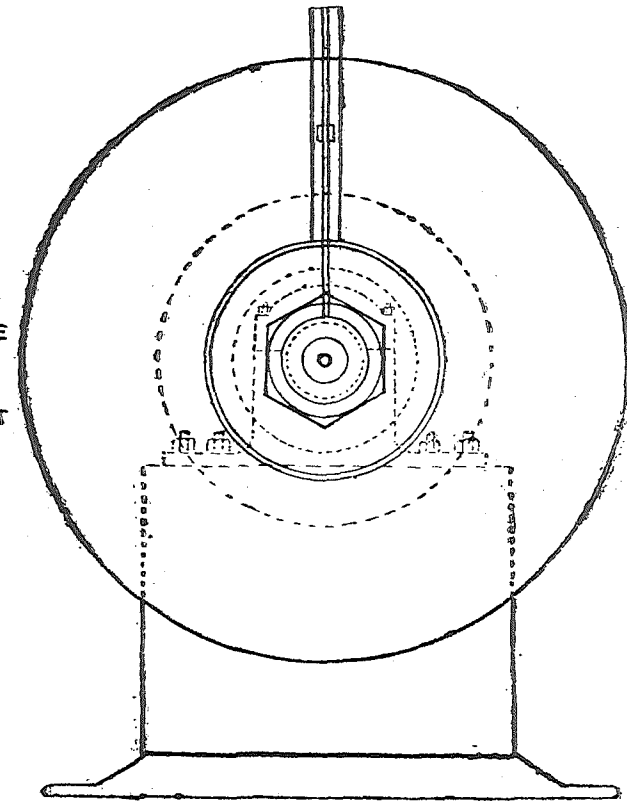
* Japanese term for steel wire rope wound with cotton twine.

SEKIYAMA WINDING MACHINE

Scale - 1/3 Full Size



SECTIONAL FRONT ELEVATION



END ELEVATION

the tension developed and may snap off. The proper adjustment can be arrived at, after a couple of trials. The wire rope is fed automatically by virtue of the nozzle design. The nozzle is provided with a neck separating the two different diameters namely that of the wire rope after winding i.e. Sekiyama. At the neck of the nozzle hole, the twine, being fed by the rotation, loops over the wire rope and pushes out the preceding loop along with the latter. The wire rope can be carried on a different spool placed at the rear of the machine. The wire rope does not rotate with the nozzle. The spool can be replenished without dismantling by starting the machine and feeding by hand from a coil of twine.

The manufacturing cost of this machine is less than Rs. 350/- including the single phase quarter horse power motor and it can wind at a speed of 60 centimeters per minute. However, further development is necessary to make it fully automatic and to simplify the adjustments.

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