

Bar counting and chain movements at CP9 and CP10 in Bar Mill

Present System:

The high accuracy, on-line bars counting is aimed at, before being made them into a bundle in finishing area/ LMMM with the existing mechanism called BBS counter. However, the high accuracy in counting of bars, could not be achieved with the existing BBS counter on account of inherently involved in process difficulties like non-separation of bars, overlapping of bars, accumulation of bars at BBS counter, particularly when high rate of production is aimed in lower sections (16-22 Rebars).

The existing BBS counter is used for counting the bar cross-sections (diameter) from 15mm to 40mm. It consists of mainly three (3) parts viz., counting wheel, transport wheel (scraper wheel) & photocell. Both counting wheel & transport wheels are driven by hydraulic motor. The maximum counting speed is 5 bars per second by means of photocell. The counting wheel picks up the bars from, conveyor chain (3) and transports it into the transport wheel and in turn, the transport wheel transports the bars into the collecting pocket (bundle holder). During the bars transporting process, the bars are counted as they pass the photocell.

Pre-determined number of bars, as required for an aimed bundle weight, is manually fed into the system which is connected to the BBS counter. On reaching the preset/specified number of bars, the operation of BBS COUNTER is stopped till the downstream mechanisms facilitating for bundling operation is ready for collecting the counted bars for the next bundle.

On cold shear cut, the shear layer is shifted from roller table to the chain conveyors which are leading to the BBC counter, namely, discharging device (chain 106), chain conveyor 1, chain conveyor 2 & chain conveyor 3.

The discharging device (chain 106) in line 1, serves to take over the shear layer from roller table and transport into chain conveyor 1. The speed of electrically operated chain conveyor 1 is 0.45 m/s. The 8 chains with 9.8m length and 11m wide transport the shear layer into chain conveyor 2.

The overlap of both chain conveyor 1 & chain conveyor 2 is approximately 150 mm. The speed of electrically operated chain conveyor 2 is 0.675 m/s. The length of chain conveyor 2 is 6.1 m & width is 11m. It gets lifted up at its rear zone by 107 mm with three (3) hydraulic cylinders. On transporting the shear layer, with

the difference in speed of both chain conveyor 1 & chain conveyor 2, the shear layer gets slightly spread and thus separating the bars from one another.

Then, the chain conveyor 3, which is located just in front of counting wheel, receives the shear layer from chain conveyor 2. The overlap of chain conveyor 2 & 3 is 2.3m. The speed of chain conveyor 3 can be adjusted step by step from 0.16 to 0.75 m/s. the slow transport speed of 0.16m/s is used during the bar counting operation. The deflector switch which is located approx. 500 mm, in front of BBC Counter is used to slow down the speed of chain conveyor 3 so as to match with the counting wheel.

Solution required:

Exact counting of number of bars and the same to be communicated to System for printing of tags to print on tags along with weight and other information.

Problem Faced:

1. As customers of Rebars are mainly from construction industry they need exact number of bars per bundle along with weight and other data. This is also a requirement for export license.
2. Due to problems in upstream the batches formed are jumbled and the bars will not be separated easily. Both end of bars will not fall parallel resulting in twisting of bar in bundle.
3. Many problems associated with hydraulic drive of chain and counting wheel.