

ROLLFORMING - SECONDARY OPERATIONS

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In this Fortyfirst series of article on Rollforming we will discuss further about the secondary operations performed on the sections. Some percentage of the rollformed sections are used as rollformed but a significant percentage of the rollformed sections to serve their final purposes must generally have other production operations performed on them. These additional operations are- to name a few, punching, notching, curving, welding, cutting, piercing etc. If these operations are performed separately, then the product will have to be handled several times. They will have to be moved/transported, stored, again moved to a separate area, stored, packed etc. This is time consuming, requires additional manpower, space and material handling.

All these amounts to higher inventory and labour cost. If the quantity justifies and technology permits it is economical to incorporate the secondary operations in line with the rollforming process. In fact, the latest trend is to incorporate the secondary operations in line with the rollforming process. These secondary operations could be done prior, in-between or after the roll forming operation. Given below are some of the secondary operations incorporated in the rollforming lines. They are- cutting, piercing, notching, punching, embossing,

welding, slitting, bending, joining of different strip material, louvering, lancing etc. Several more operations keep adding to the list year after year.

Cutting

This is a traditionally used method. Here one can have pre-cut sheet-feeding method or post-cutting method. Precut sheet-feeding is used where the required piercing and notching operations are difficult to carry out on the finished sections produced. Also, if the section is wide and post cutting operation becomes complicated or expensive, pre cutting method of sections produced is normally done. Post cutting can be done by stop and cut method or by flying shear/saw cutting method to the required lengths of sections.

Welding

In India, barring tube and pipe mills, most of rollformed sections produced nowadays are open sections. But in future the trend is going to be, to produce more and more welded closed sections. Here, once on-line welding system is introduced, the rollforming machine will have to run continuously without stopping. Each stopping will entail a loss of open joint tube of certain

length depending upon the speed of production. Closed joint sections of any shape could be usually on-line welded using Radio-frequency Welding method or Resistance Welding methods. Tube/Pipe mill is a classic example of rollforming coupled with the welding of open joints.

Curving and Spiral Forming

By providing a curving fixture at the exit end of the rollforming machine the sections formed could be curved to different radii or could be produced in spiral form to simplify cutting. As the spiral angle of these products are usually small the product springs back to the circular shape after cutting to length. Two wheeler rims and mudguards are produced in this fashion and cut to the required lengths continuously. The rim sections are finally flash butt welded into closed rings off-line.

Slitting

It is also possible to incorporate a slitting head prior to rollforming. However, this requires more space lengthwise. Usually with a middle slit two different products could be rollformed.

Punching, Embossing, Numbering, Piercing & Slotting

Many of the above mentioned operations could be incorporated into the rollform tooling. In general, these operations are performed with rolls located ahead of the first forming tooling pass. Piercing or slotting punches for light gauge materials are frequently mounted on a male roll and the dies on a female roll. The roller dies are designed to punch the slugs completely through the metal strip. See Fig. 1, 2 & 3

Wherever a sharp embossing pattern of higher depth is required over a relatively flat area, the embossing rolls are placed next to the exit of the machine to avoid flattening of the design by subsequent forming pressure. See Fig. 4 & 5

Pre Punching & Notching

Fig.9 shows a rollforming line with pre punching and

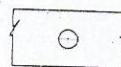


FIG.1



FIG.2



FIG.3



FIG.4



FIG.5

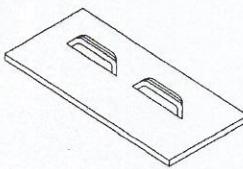


FIG.6

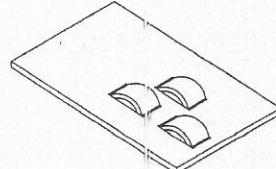


FIG.7

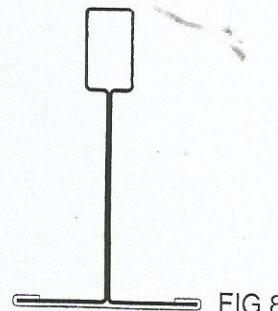
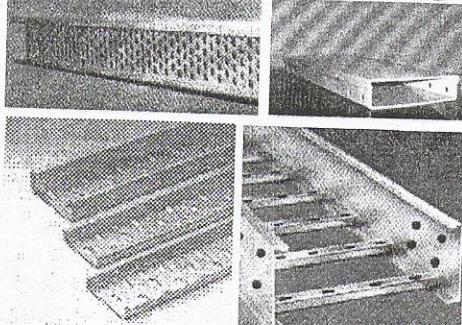


FIG.8

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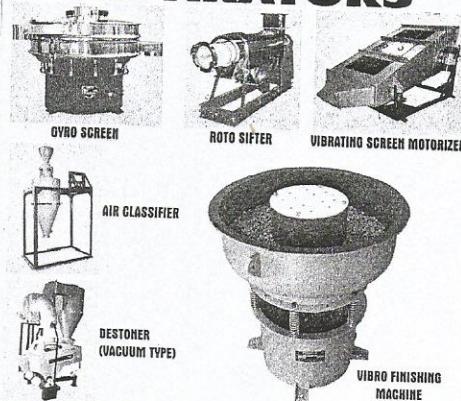
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