W12 Four Rollers Rolling Machine

This four-roller roll-bending machine, is used to pre-bend and coil in the industries such as the pressure container, machinery, hydroelectricity, architecture. It also has the function of coiling and leveling.

The upper is the main drives. It drives the lower roller and side rollers through the friction force between the plate and the rollers, which offer the torsion for the coiling.

The upper roller is droved by motor, lower roller, side rollers, reversal frame and supporting rollers are hydraulic transmission.

The lower rollers move vertically, side roller move slant, synchronization precision is $\leq \pm 0.15$mm.

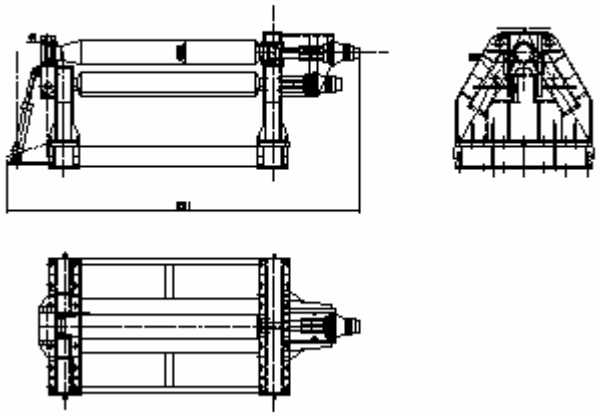
Pre-bending is made by the lower roller ascending to nip the plate, the side rollers ascending to complete the end pre-bending of the plate.

This machine has the symmetry bending and asymmetry bending capacity through change the position of the side rollers

This machine adopts the central lubrication system.

The control system is employed the OMRON PLC.

Lower roller and side rollers position sensor adopt the light encoders to supply the high accuracy.



Structure

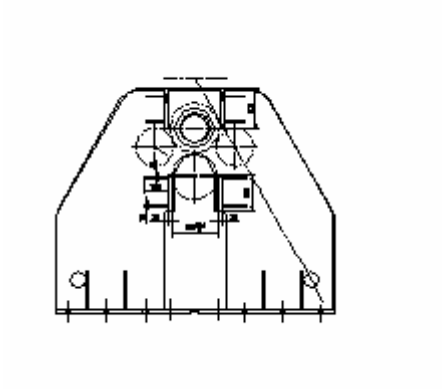
The machine consists of the main structure, upper roller setting, main transmission setting, lower roller setting, equilibrator setting, reversal setting, base plate, electric system, hydraulic system and lubricating system.

3-1 Main structure

Main structure is composed by base, fixed side frame and reversal side frame. Each part is steel welded structure.

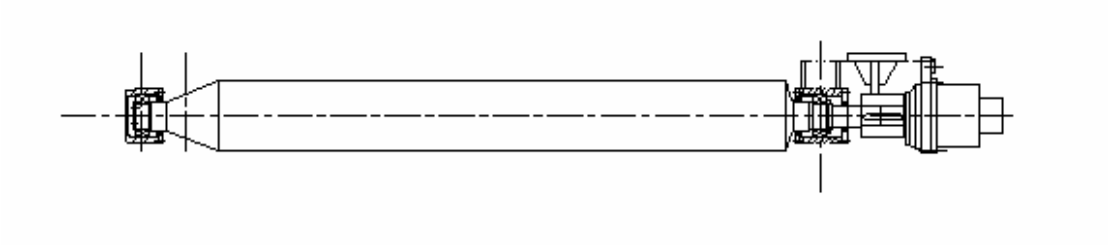
The frames are positioned on the base by screws and the two supports are connected together by articulated beam which ensures good rigidity.

There are lead rails for lower roller and side rollers on the two side frames. In the fixed side stand, there is bearing box of the upper roller which is a closed structure. In the reversal side, there is supporting setting for the reversal side frame. The force during the coiling is endured by the two side frames.



Upper roller setting

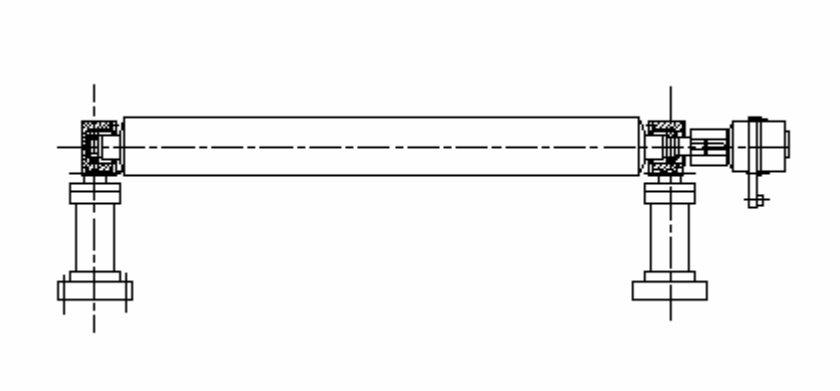
Upper roller material 40Cr, tempering HB260-300, HRC45-50



Lower roller setting

Lower roller setting is composed by lower roller bearing base, bearing, lower roller cylinder, lower roller hydraulic motor and so on.

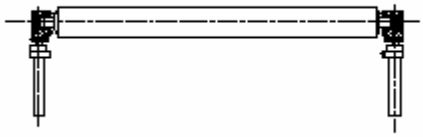
Lower roller material 40Cr, tempering HB260-300,HRC45-50



Side roller setting

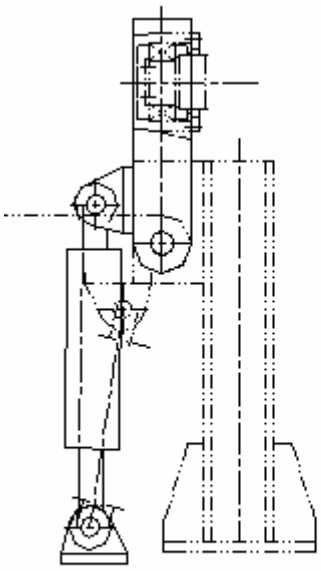
Side roller setting is composed by two side bearing base, bearing, side roller cylinder and so on.

Side roller material 40Cr, tempering HB260-300,HRC45-50



Reversal setting

Reversal setting is composed by ram, reversal cylinder and so on, it’s easy to draw out the finished working piece.



Main transmission setting

It composed by YZR motor, V-type texrope and reducer.

Equilibrator setting

It adopts helix structure; it’s equipped at the fixed side and be tightened at the base through bolts.

Lubricating system

The main reducer and side rollers reducers adopt the splash lubrication, natural cooling. When surrounding temperature is -10--0℃, the lubrication oil is N46. N48 lubrication oil, when surrounding temperature is 0--40℃, the lubrication oil is N68. N100.N150.N200 lubrication oil; you can use oil gun to lubricate the other lubricating points, lubrication greases is ZGN40-1(winter) and ZGN40-2(summer), twice per duty.

Hydraulic system

It's composed of gear pump, valve group, and pipes. The system is composed by pressure adjusting circuit, synchrony circuit and speed circuit.

The pressure adjusting circuit adjusts the working pressure through the overflow valve, the Max pressure is 19.5Mpa; the synchrony circuit separates roughly the hydraulic oil to the ascending and descending of the upper roller through the by-pass valve, the restrictor valve adjust the upper roller ascending and descending; The displacement transducer detect the displacement, the synchronization precision is ±0.15 mm; The speed circuit control the dumping and resetting of the reverse device through adjusting the restricting speed by restrictor valve.

Electric system

Electric control system consists of controlling table, hand button box. Motivate power is three-phase four lines 380V/50Hz.

Controlling circuit adopts PLC programming control system with less relay and reliable actions. It can be used for long time.

Control box is equipped with all controlling buttons and direction lights during bending so as to monitor the whole machine's working status and control the operation.