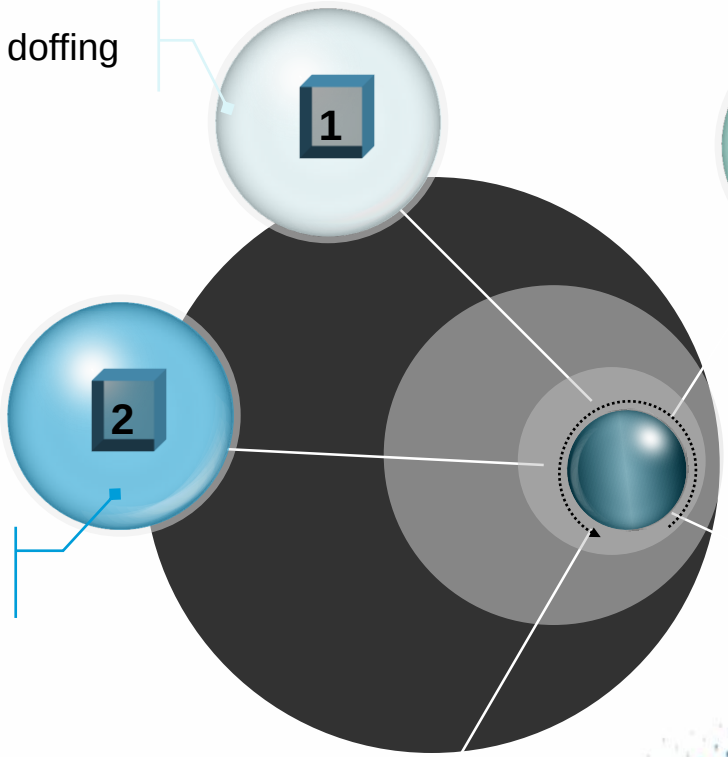
Hicorp Machinery (Qingdao) CO,. LTD.

CMT1801 Automatic doffing computerized roving frame

CMT1801 Auto doffing Simplex

Features of CMT1801



Automatic doffing

Waste roving cleaning automatically

Automatic piecing

Automatic transfer to ring frame

Automatic exchanging of empty bobbin with full roving

Contents

- General Safety regulation;
- Installation training;
- Commissioning training;
- Concentrated training;
- Examination for training.

Section I. General Safety Regulation

1.Symbol and safety indicatings

Dangerous warning!

Electric shock!

Dangers warning of being squeezed and winded!

Caution slip down !

Remark!
Indicating given some special information or reminding something!

Dangers warning of being squeezed by rollers or gears!

Do not stand here!
Violation this warning will result in serious injury!

Dangerous area!

General Requirement

1) Installation, operation, maintenance and repair work must be done or guided by proper trained person.

2) Comply with the safety norms and operating instructions.

3) Safety limit switches and safety monitors are not allowed to bridge connected.

4) Forbid to touch drive device, gears, belts, rollers, spindle, fan and other dangerous areas when machine is running.

5)Keep away from rotating parts if operator wear loose clothes or hair.

6) Make sure to set up fire prevention measures.

7)Shut down machine to check whether main switch is in the closed position.

8)Grease and oil dripped on the ground must be removed immediately to prevent slipping.

9) Damaged or overloaded parts must be replaced immediately.

10) Do not touch or grasp heated shell, bearings, motors or other moving parts with hand.

11) Keep the protective door closed.

12) The machine is designed for single-operator operation, so only allow one person to operate it.

General request for electrical system installation

1) Electrical installation only allowed to be done or guided by professionals.

2) Shut down the machine to check whether the main switch is in the closed position;

Before working, cut off the power supply of main switch completely.

3)Do not touch live parts.

4) Please note the discharge time of the capacitor.

5)The protective device must be checked every 12 months

* Workshop Site Requirments:

The workshop site must be capable for installation of simplex.

1) Illumination device should meet demand for installation, and prepare 220V temperary power source for electrical installation tool;

2) Clean up the site and reserve the grounding bolts and the power supply outlet holes according to simplex ground odiagram;

* Installation crew Requirments:

1) The buyer should dispatch 20 fitters and 10 electricians to assist installation.

* Installation tools requirments:

1) Prepare a forklift with a capacity of more than 3 tons to lift sparepart container and headstock;

2) Prepare the ink, silk thread, tape measure, steel ruler, pencil, chalk drawing in advance to draw baseline, prepare the fitter tool, unboxing tool.

3) Prepare necessary materials, gasoline, rags, sandpaper, saw blade, red oil, lithium grease, etc.

4) Scaffolding 4 sets, about 2 meters height.

5) Prepare a electric hammer with 4 sets of drill Φ12, Φ14,Φ16. Prepare 2 hydraulic cars (2 tons).

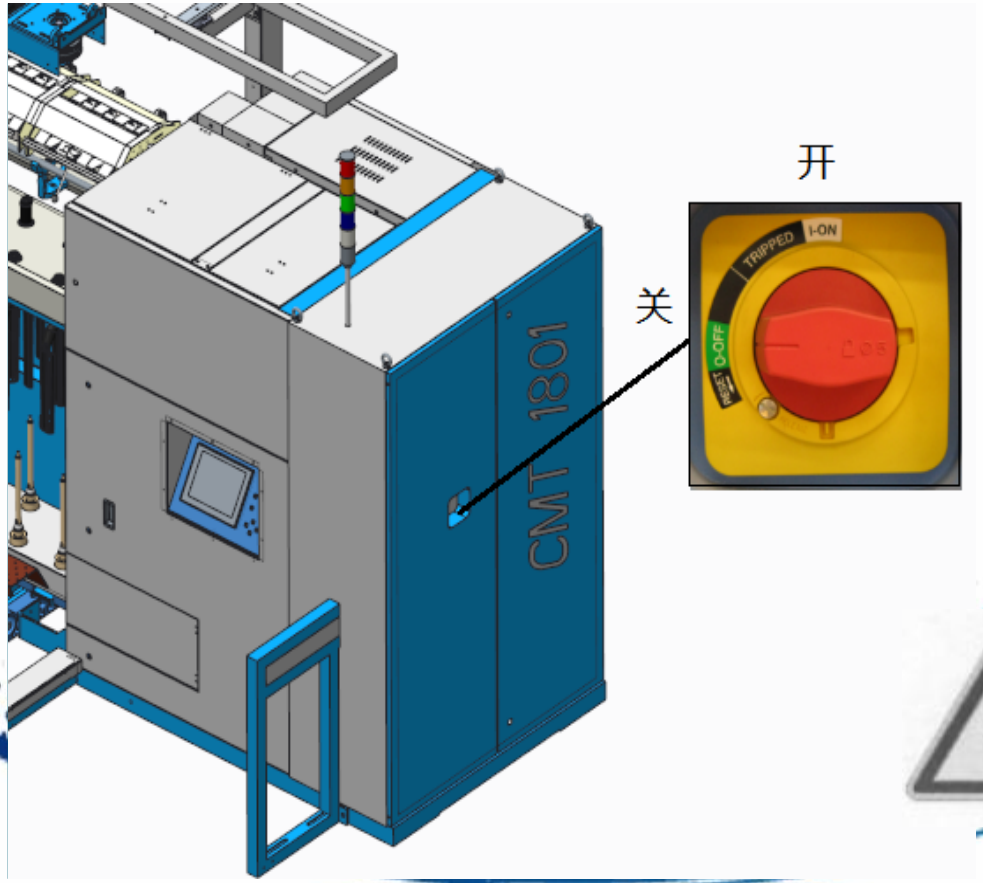
Security device

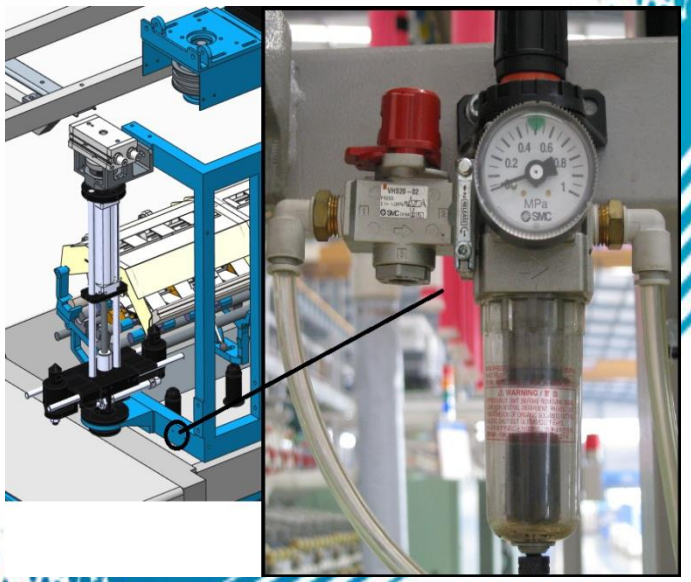
1) Main switch:

Turn it to “0-off ” while maintenance and adjustment.

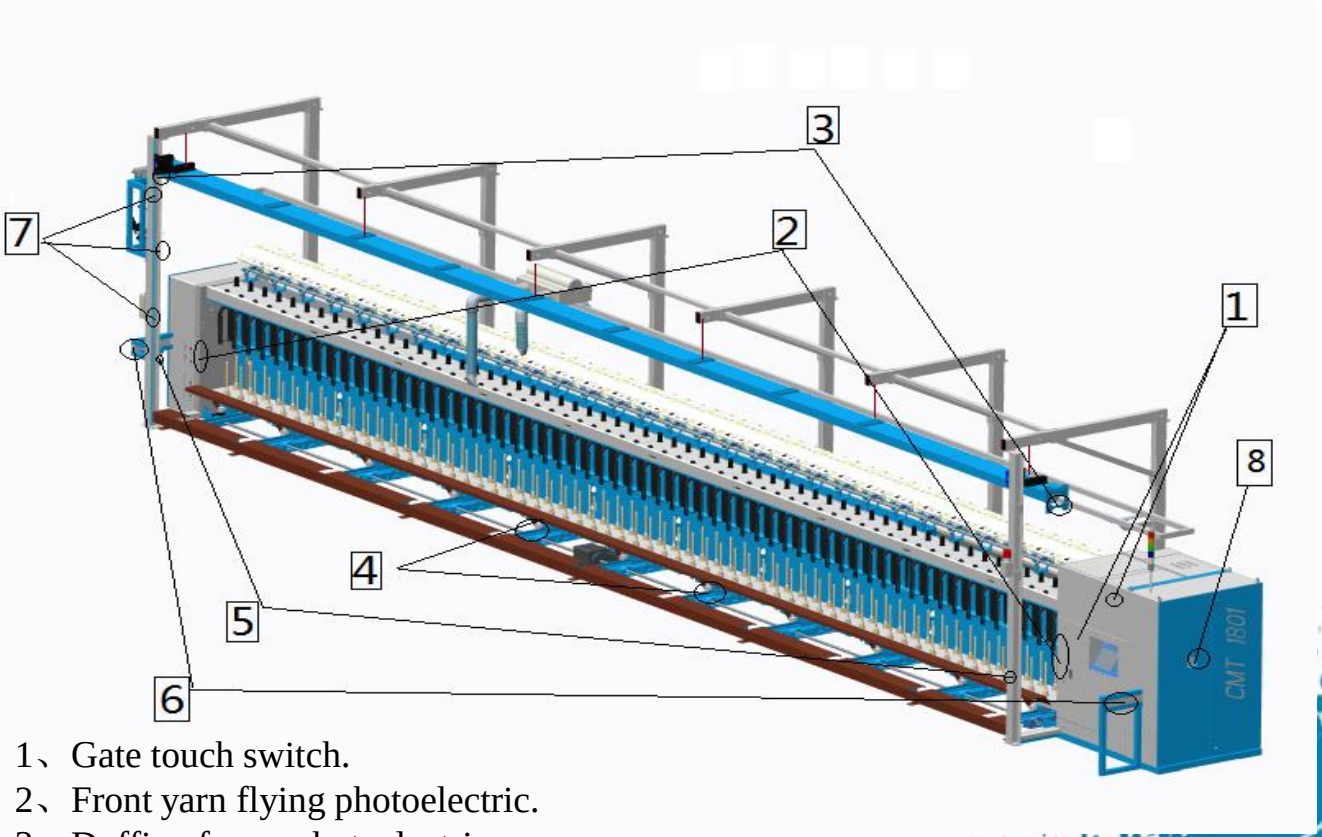
At this moment, mechanical pneumatic system can not exhaust automatically, so as to switch off manually.

If more than one worker is working on same machine, a warning sign must be placed at the main switch.





Security devices which can be automatically triggered.



1、Gate touch switch.
2、Front yarn flying photoelectric.
3、Doffing frame photoelectric.
4、Remove out/in limit switch.
5、Column security photoelectric.
6、Guardrail detection photoelectric.
7、Doffing frame lifting limit switch.
8、Main switch.

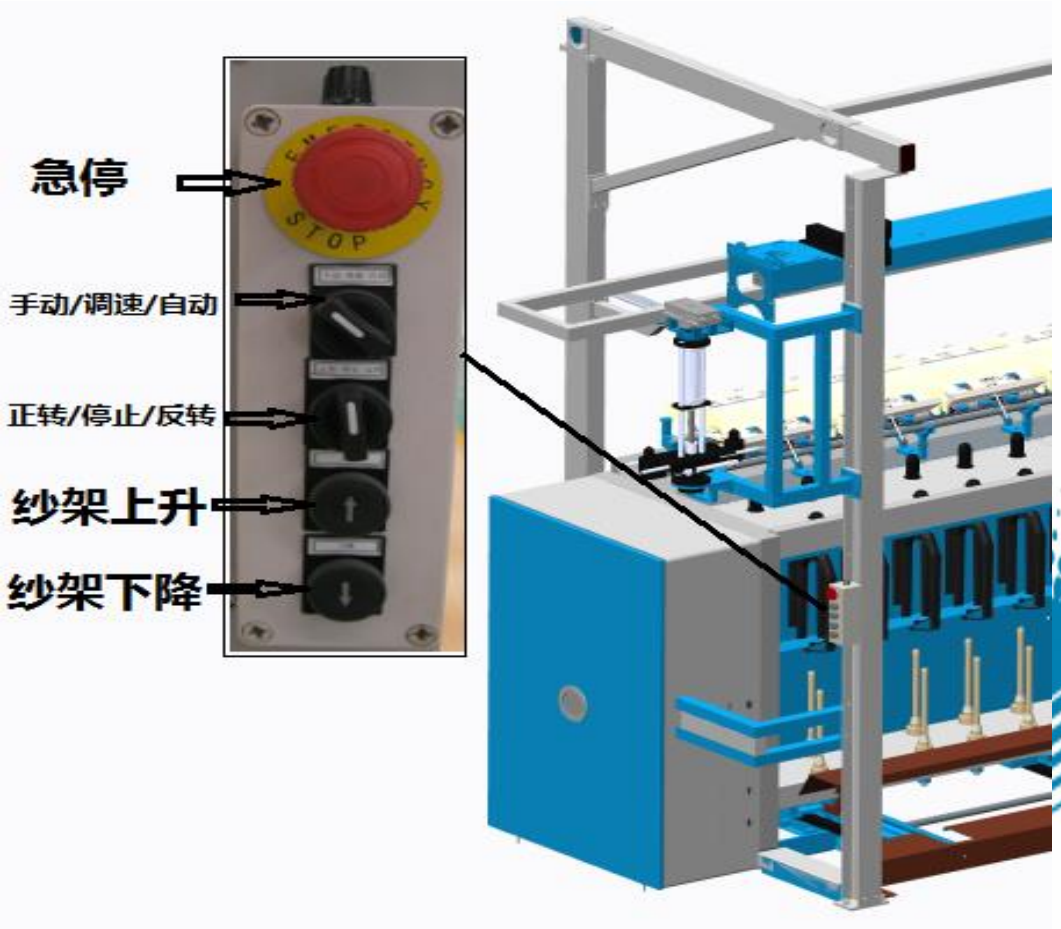
Operator can break off security linkage to shut down machine (In clear purpose).

Emergency power off switch

1) Headstock emergency power off switch.

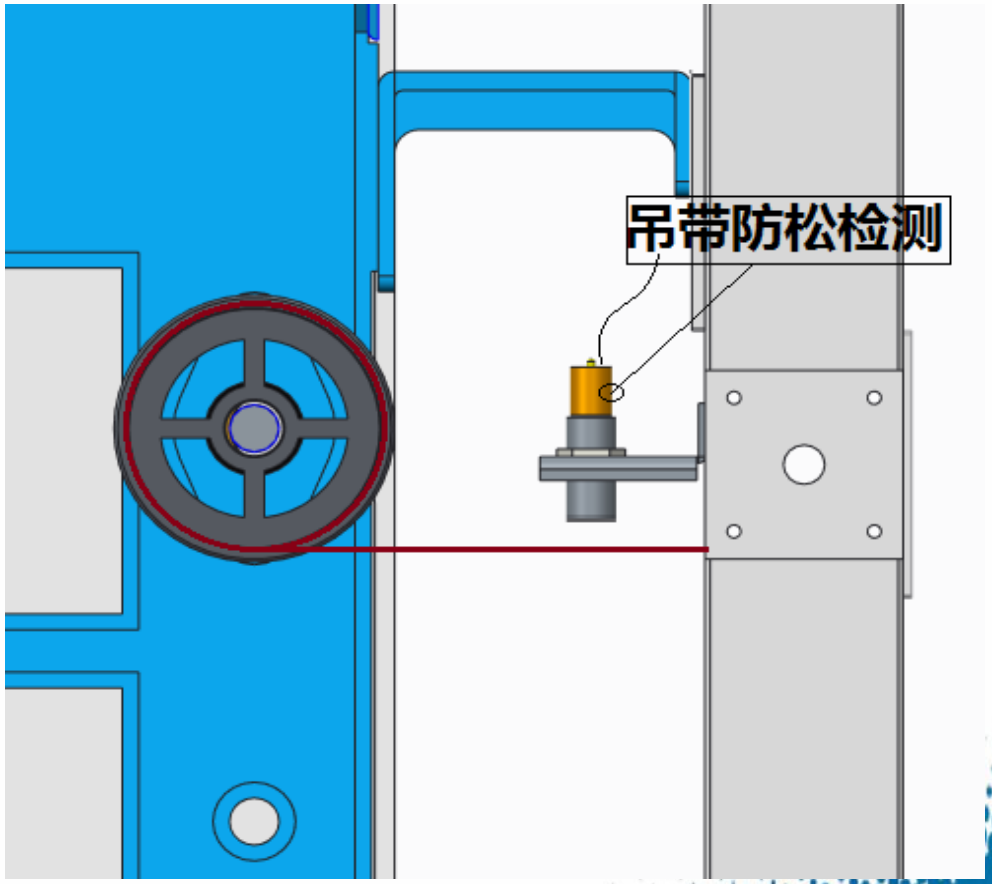
Head-stock emergency power off switch locates in front of control box panel.

2) Tail-stock emergency power off switch:



Rear emergency power off switch locates on rear guide column.

3) TC belt anti-winding detection switch

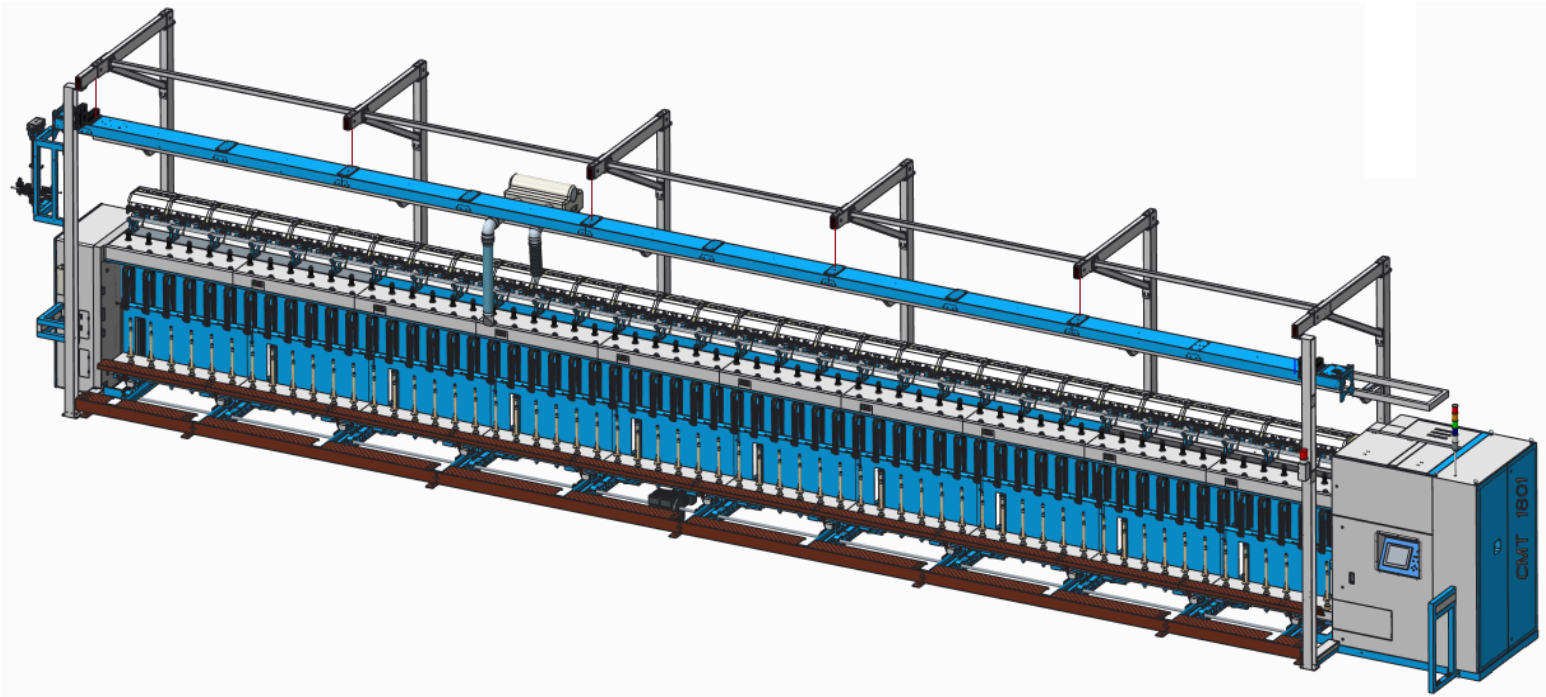


When frontal bobbins hold against doffing frame or TC belt reversing, the photoelectric sends signal to stop simplex.

4) Other security devices.

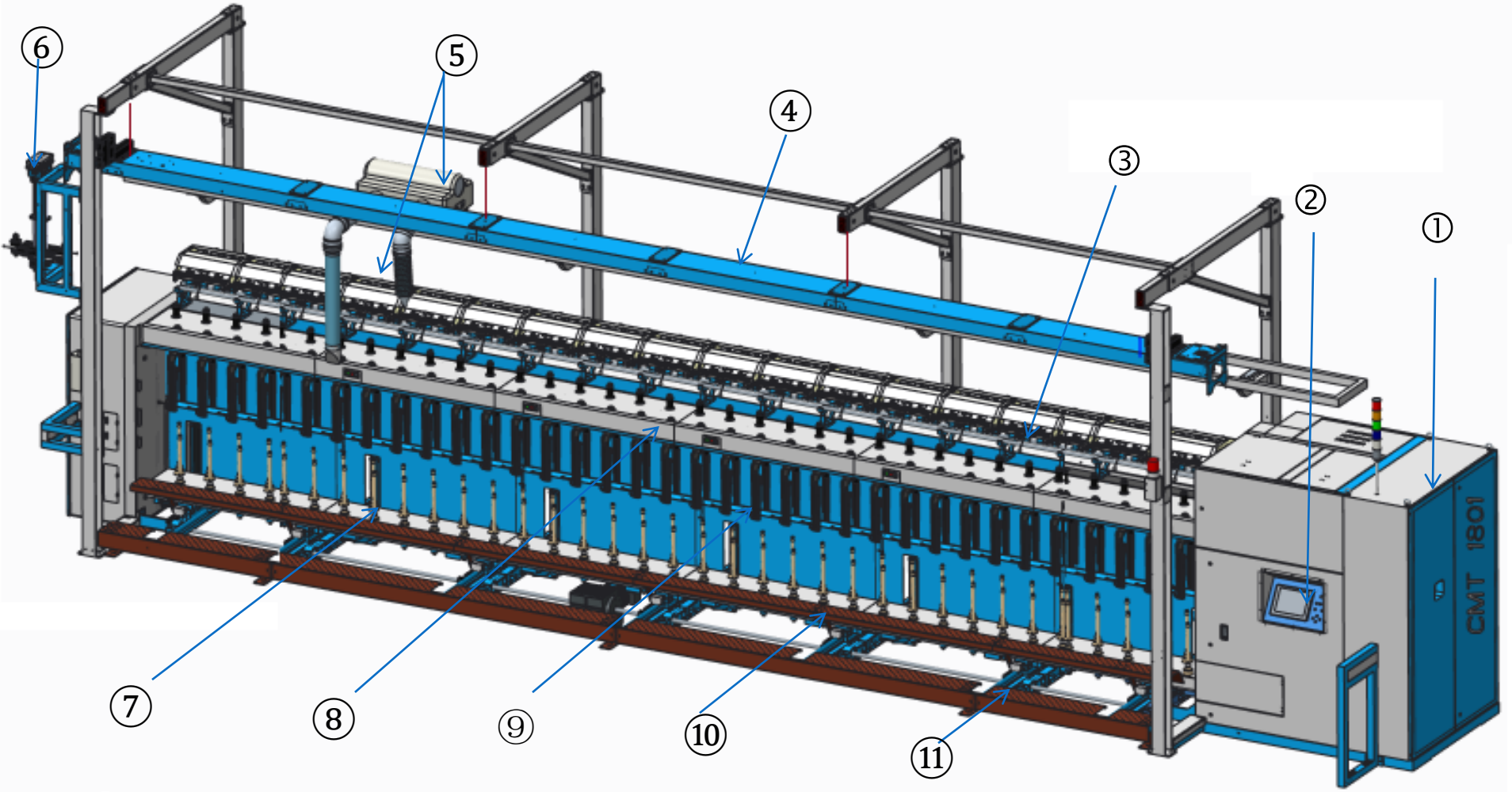
This button is equipped on flyer rail cover for jog, stop and start.

Dangerous area:



1.Motor wiring terminal in headstock;
2.Bobbin rail move in and out area;
3.Doffing frame lifting device;
4.Yarn exchanging manipulator area;
5. The drafting area;
6. Cleaning device;
7. Flyer area;
8.Bobbin rail system;
9.Electrical control box.

Main Structures:

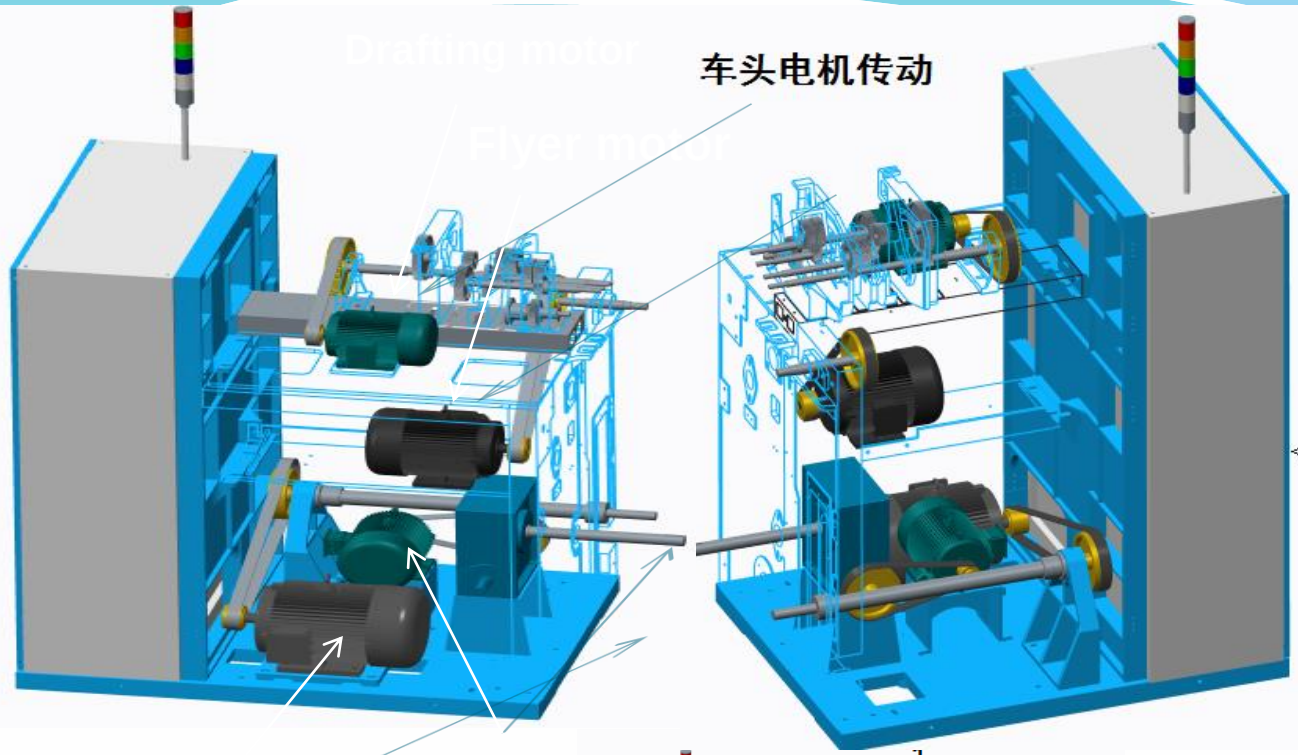


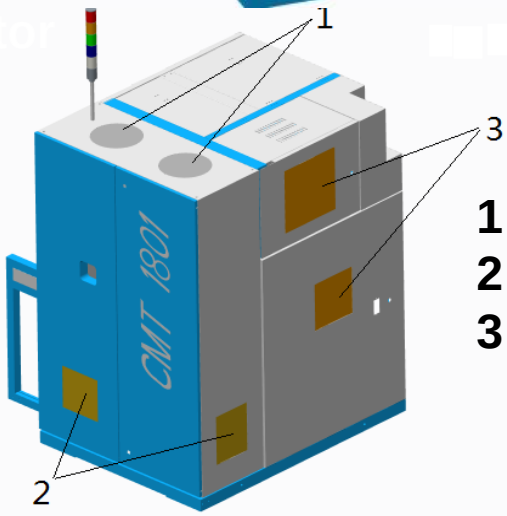
⑩ Bottom rail;

⑪Removing out device;

Balance device、feeding、etc.

Headstock





1、Electrical cabinet colling fan;
2、Electrical cabinet colling fan;
3、Inside colling fan.

Main specification and parameters

1、Machine type:	CMT1801	CMT1801-194
2、Spindle gauge :	220mm	194mm
3、Spindle number:	96/108/120/132	96/108/120/132/（144、156）
4、Sptich:	440mm	338mm
5、Spindle number:	4/section of roller	4/section of roller
6、Bobbin dimension:	φ45×445mm	φ45×445mm
7、Full package dimension:	150×400mm	135×400mm
8、Drafting multiple:	4.2-12	4.2-12
9、Twist range:	18-80T/M	18-80T/M
10、Suitable thread density:	200-1250tex	
11、Draft form:	Four roller double short apron draft (three roller draft optional)	
12、Roller diameter:	Up: 28.8、28.8、25、28.8 (except TEXPARTS、SUESSEN) Down:28.5、28.5、28.5、28.5 (32、32、32、32)	
13、Suitable fiber length:	22-50mm four rollers draft 51-65mm (three roller draft optional)	
14、Pressure form:	YJ4-190×4 Pendulum weighting arm	

(Option for TEXPARTSF spring weighting arm、pneumatic weighting arm and leaf spring weighting arm)

15、Pendulum spring pressing weight： unit：N/two flyer

Three gears	front	Center front	Center back	back
black	90	150	100	100
green	120	200	150	150
red	150	250	200	200

16、Leaf spring pressing weight（See the instruction manual for adjusting method） unit:N/two flyer

Three gears	front	Center front	Center back	back
I	185	175	140	175
II	230	220	170	220
III	280	270	200	270

17、Roller center distance: front area 35-57mm，center area 47-68mm，back area 45-68mm
18、Spindle speed: no-load mechanical speed is 1500r/min
19、Roller stool angle: 15°
20、Feeding device: guide roll overhead system, positive feeding
21、Cleaning form: Intermittent positive rotary woolen circuit type cleaning device
22、Flyer form: closed suspend
23、120spindleφ400sliver can peripheral size：15460×4035×1900mm
13900×4035×1900mm
120spindleφ500sliver can peripheral size：15460×5100×1900mm
13900×5100×1900mm
24、Machine level: 1500mm

24、Roving breakage stop device: Infrared photoelectric control

25、Motor start form: Frequency conversion changes speed and slow speed to start/

26、Machine hand direction: Right hand device or left hand device

27、Main motor power : 11KW (144&156 spindle : 15KW)

28、Input voltage: Three phase five - wire system AC 380V±10%、AC220V±10%、power source wire 16m㎡

29、Total power rate: (120spindles/132spindles):28.02KW (144spindles /156spindles):34.02KW

(new dust collector 120/132spindles):25.045KW (new dust collector144/156spindles):31.045KW

30、Flyer motor:（120spindles/132spindles）5.5KW; （144spindles/156spindles）: 7.5KW

31、Winding motor: (120spindles/132spindles): 11KW (144spindles/156spindles): 15KW

32、Rail lifting motor: 2.2KW

33、Roller motor: 3KW

34、Rail removing out motor: 0.37KW

35、Doffing frame lifting motor: 1.1KW

36、Doffing frame reverse motor: 0.75KW

37、Suction motor（for new dust collector, several simplex share one）: 3KW

38、Top cleaning motor: 1.1KW

39、Scratch motor(new dust collector): 25W

40、Insulation resistance: A.C.500V (table measurement)≥5MΩ (between each terminal and the ground terminal）

41、Surroundings temperature: 0~50℃

42、Surroundings: non-corrosive gases, combustible gases, oil mist dust itc.

43、Altitude: below 1000m

Section II. Installation training

Preparing work including **drawing benchmark line, cleaning and washing the unpackings** before installation, which directly affects whole installation quality, should be given enough attention.

a) Draw benchmark line in accordence with foundation diagram (sees attached in manual).

b) Wash the unpacking parts according to container serial number and **count as packing list**.

(1)Before installation, clean frame parts with rust-preventative oil with high grade gasoline. when clean roller, pay special attention to the hole clean, prevent being killed when joint.

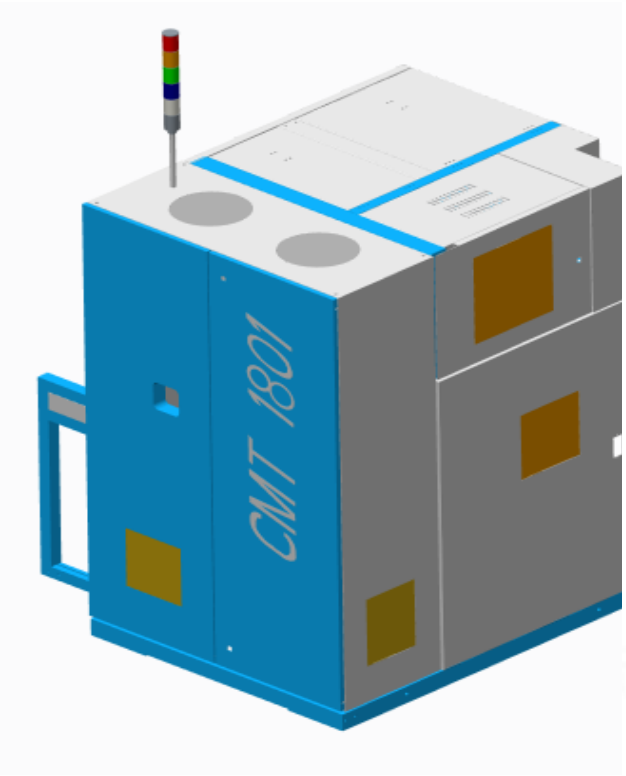
(2)Aluminum alloy flyer ban on the use of gasoline or alkaline water cook wash to prevent electrophoretic paint metamorphism.

(3)Cleaning the bearing should use kerosene or spindle oil, points coarse and fine wash two step, and immediately join specified amount of grease, attention that sealed bearing can only use clean cloth erase oil pollution, not on the sealing condition with solvent cleaning.

Installation sequence

(1) Headstockt；
(2) Install frame parts: Including headstock, frame, beam, tail wallboard, joint the up and down Angle in back frame；
(3) Install the frontal winding parts:including bobbin rail lifting device, the bobbin rail removed device and the up and bobbin rail, the flyer, three big cone (flyer gear, the spindle bar gear, driving gear) etc. revise the shift out axial spacing, and then install shift out block and longitudinal shift out shaft, remove reducer, gear etc；
(4) Install the spindle and bobbin rail: First of all install the flyer rail roughly, and then install lifting device and revise, then take remove block palm rest for reference to install the bobbin rail, then take the bobbin rail hole for reference to position the flyer rail, and at the same time, take the flyer rail hole for reference to position the lateral size of the bobbin rail, and then put the lift (spring) balance device, flyer, spindle bar, the spindle drive gear, tensioner and other parts；
(5) Install the doffing frame: First put braces elevator drive part, and then install back frame post and revise, reload beam, cross brace and head to tail guide pillar.
(6) Install the draft parts: make sure roller stool position, and revise front roller height in and out position. According to the technological requirements, determine the center and back roller gauge, install weighting arm, roller, aprons, collector, and the spare parts such as cleaner
(7) Install clean suction and cotton guide roll part: first install duct and suction hopper, then install cotton guide roll column, the guide roller, roving fork parts.

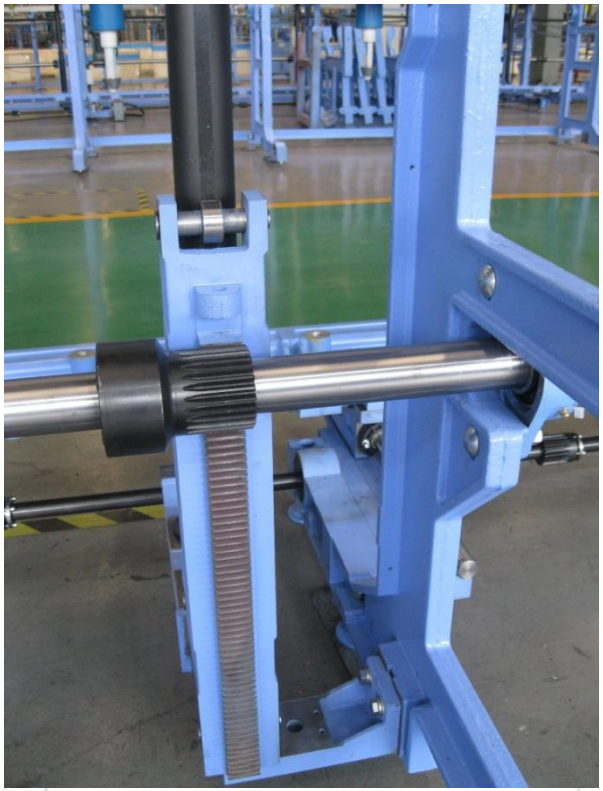
1. How to install headstock:

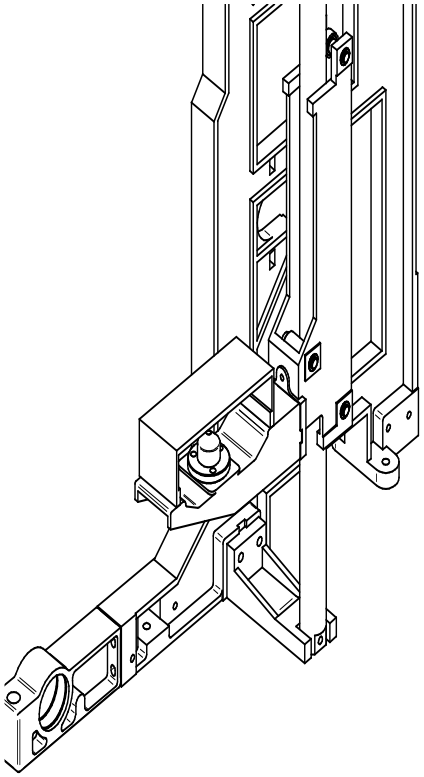


Rise the headstock and put it above bottom plate contour line with hydraulic forklift, hang four anchor bolt in the front bottom anchor hole, and place the pad iron plate directly below the adjusting screw, then smoothly drop it to make every screw and pad iron get closed. Check again carefully weather head plate around and second panel lateral line is in a line with benchmark.

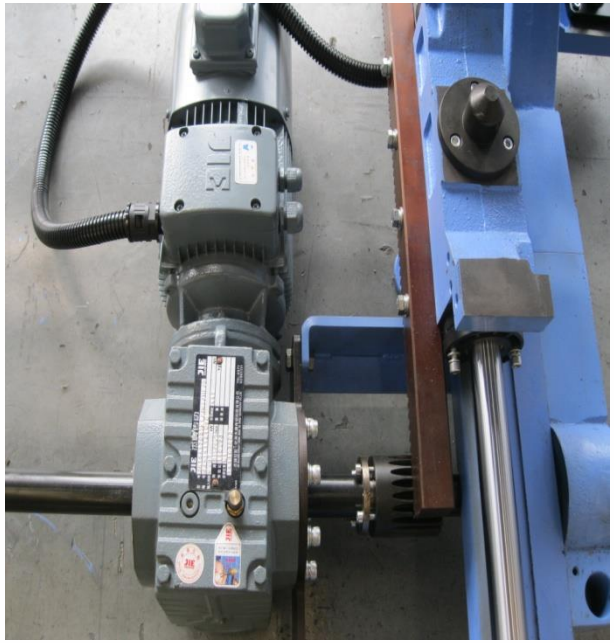
3. Install the winding part in frontal of simplex:

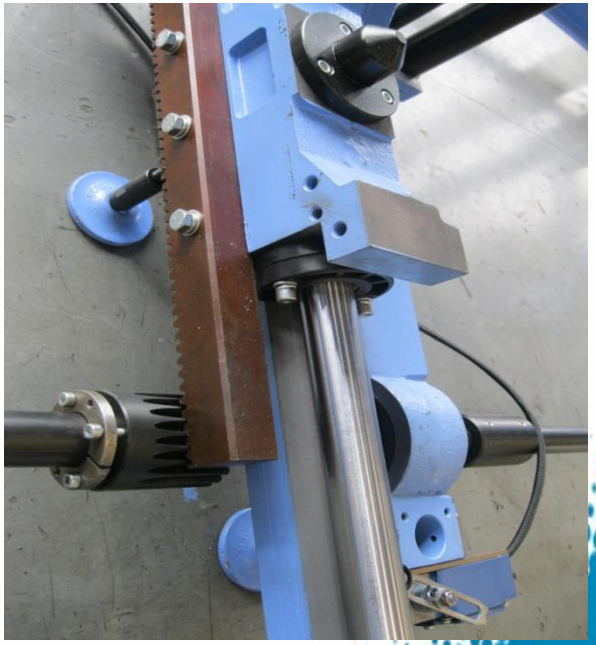
3.1 Bobbin rail lifting device:





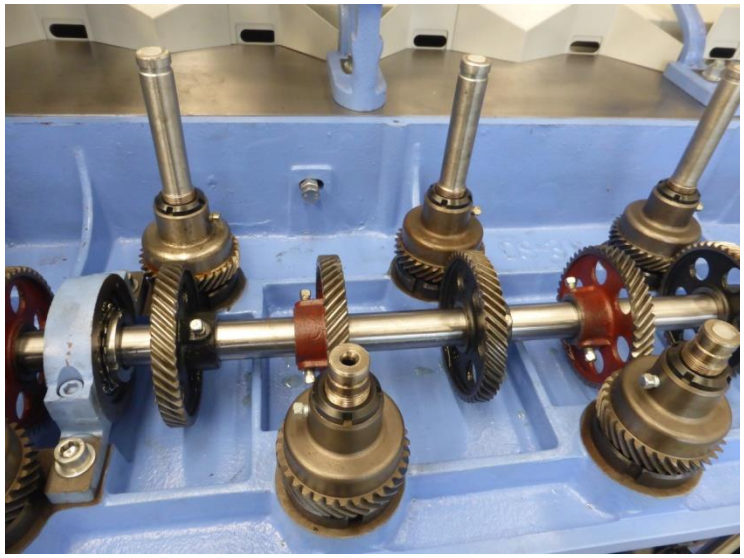
3.2 Bobbin rail move-out device:





a) The bobbin rail shaft must be leveled and aligned;
b) The remove block must be installed on the shift shaft directly and leveled;
c) Then install remove power shaft, deceleration machine, locking sleeve, the gear, expansion sleeve, dust cover, joint sleeve in shift out carrier bearing hole in turn from the end frame, use joint sleeve to connect each axis, locking nut, installed reducer torsion arm;
d) Install dust cover on each shift out saddle, at last connect the gear and rack with expansion sleeve.

3.3 Install up and bobbin rail:



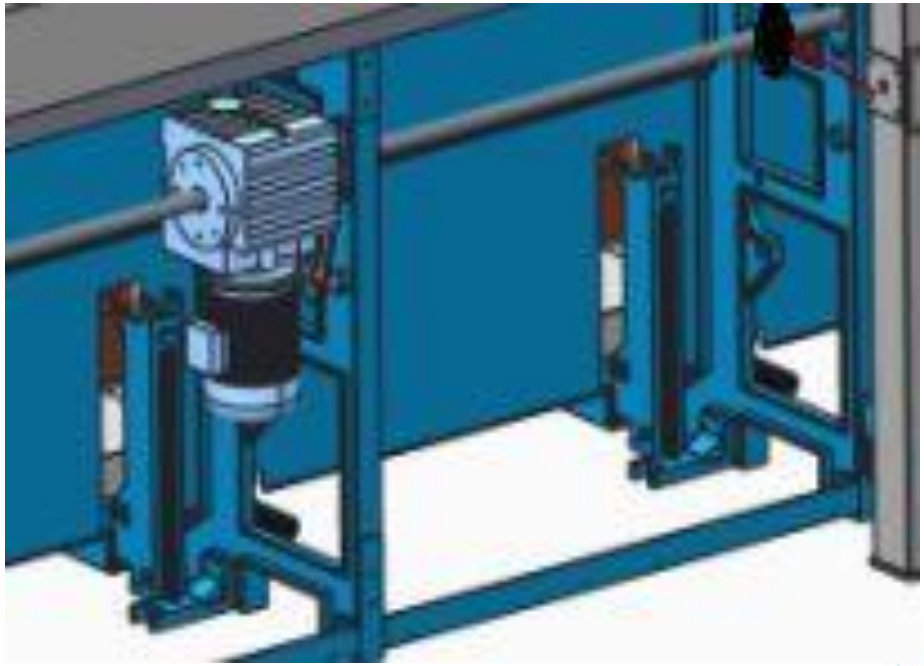
3.4 Install lifting balance device:

1)Fix the elliptical with variable diameter and circular wheel on the lever shaft and fix lever shaft in each support;

2)Adjust the elliptical and circular wheel position ,link the end of the TC condole belt with the elliptical and circular wheel;

3)Link the other end with the lifting rack and spring , form balance device.

3. 5 Install support of doffing frame:



1)First install the back frame drive shaft sets on deceleration machine, and fixed it in the middle bracket through the torque arm, then find level and fasten tightly.

2)Install the other joint shaft geting through support in turn and fix it with bearing seat;

3)Then fix the driving wheel on shaft, a cover must be installed to connect between shafts. Find level and fasten the bearing and connecting sleeve screw.

4)Install frame column, beam, cross brace and front guide post in turn.

3. 6 Install flyer and bobbin drive device:

1)Flyer and its bearing, has been made up in factory, when installed put the flyer bearing vertically in flyer rail hole, and lock it by the tool T29 round nut, first inner row, secondly outer row, then install flyer gear.

2)When install bobbin gear, take flyer center as the benchmark, use the tool T38,T39 to make fine adjustment of bobbin.

3.7 Install drafting device:

1) First of all, clean roller to remove oil pollution;

2) Install the roller;

3) Adjust the roller gauge;

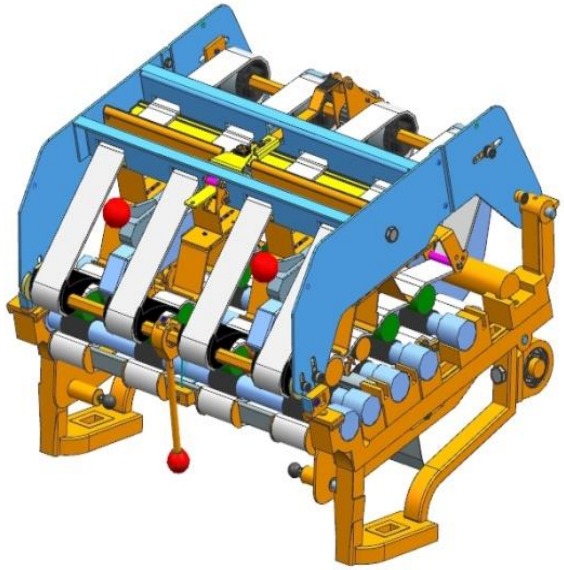
4) Put the down rod into the down apron.

3. 7.1 Install weight arm:

1）First wear the weighting arm in the weighting arm shaft, then take front roller work surface as a benchmark, use T24 tool to keep weighting arm shaft center 251mm away from the front roller center(other types of weighting arm see specifications).

2）The position of weighting arm side is determined when roller and roller groove is in a line, front and back position is satisfied with roller gauge process requirement, spacing calculation is provided in the weighting arm specifications, high and low position matches with pressure regulation.

3.7.2 Install up and bottom cleaning devices:



1)Up and down cleaning drive bearing is installed in turn into roller stool, which is wear into the drive shaft and eccentric pendulum arm. It is required that height is consistent.

2)The up and down cleaning parts are installed on support shaft, jointed with eccentric pendulum arm. In order to make the eccentric driving force uniform, reduce the load. The eccentric of the whole machine should not be in a position, adjacent four eccentric and shaft offset 90 °.

3. 8 Install the sliver guide frame and upper suction motor:

First determine the headstock and the rear of the frame column height and vertical to serve as a reference to adjust the other post position.

Then 5-6 people at the same time raise the guide roller, put it into the bearing pedestal, fasten the post with expansion bolt at last install the sliver-separate fork.

3. 9 Install upper and bottom pedal:

Here it is.

It is request that pedal in the same height and same level;

Fasten the down pedal with expansion bolt.

3.9 Install stain strip:

1) Before installing, check doffing shelf braces, ensure the condole belt is in drive wheel and transition round groove, no torsional phenomenon. The head section doffing frame cover plate should be raised by two people to the installation position, the third person get the braces through the doffing frame cover plate fixed silk hole, with nut fixed, fix other doffing frame cover plate in the same way;

2) After all doffing frame cover plate installation ends, use level to level the doff frame cover plate. Then install the guide, the rotation cover of frame end steel belt, headstock steel belt expansion device, steel belt, hanged spindle;

3) At last adjust the steel belt tension and hanged spindle position.

4. P

just use bolt and the

5. Electrical system installation:

The electrical part can be installed at the same time when headstock and stand is fixed firmly.

1. Wiring:

a)The wiring work should be done by professional, otherwise, shock and fire risk may occur.

b)All terminals should be used cold terminal to avoid unnecessary faults caused by poor contact.

c) Try to avoid electromagnetic interference caused by parallel of power line and signal line.

d)All external wiring lengths should be suitable. Extra wire should be cut rather then put into wire through to keep neat.

e)All electric element bolts should be tighten again to avoid poor contact.

2. Examination:

a)Please keep irrelevant such as wire heads, iron filings and metallic line out of electrical components.

b)Please examine each wire carefully after finishing external wiring on electrical box to avoid leakage connection, disconnection.

c)Clear the remaining wire heads completely in electrical box to avoid unnecessary fault caused by short circuit or spark.

d)The external of electrical box should be clean. Ensure everything is correct before start to test.

3. Motor wire connection:

a)First to check wire on nameplate of motor whether belongs to star or triangular, wires head must be pressed with terminal head rather than naked copper wire to avoid short circuit caused by copper wire connection.

b)Because of leakage current on inverter, the ground wire of invert and motor should be connected to earth reliably to avoid electric shock.

c)Use the ohm gear of universal meter to test insulation resistance between each phase of motor and ground to check whether point to gigantic after finishing motor wiring. If not, check motor wire again.

4. Installation for photoelectric cell and button:

4.1 Install photoelectric cell:

a)Before installation fix photoelectric frame tightly with screw.

b)The screw may lose as time went by, which results into frequently stop caused by photoelectric deviation.

c)Especially sensor wire layout in headstock must be fixed tightly in order to avoid unnecessary troubles caused by drop part pulling off by universal shaft.

d)Complete examination work should carry out on time.

4.2 Install button:

a)The button plays key role in starting, jogging and stopping simplex.

b)Special attention should be paid when installation button wire through flyer rail to avoid accident caused by fault signal transmission into PC result from wire cuting off by machine running.

c)It is suggest that the signal wire color and button should be consistent with each other so as to decrease error probability and easy to examine.

5. Voltage examination:

a) Ensure the rated voltage and input voltage to be consistent with each other.

b)The machine is using three phase, five-line for power supply. i.t. three phases, one zero line and one ground line.

c)The indictors and PC use 24V DC.

d)Use AC voltage of universal mater to test and make sure each phase voltage is 380V±10% before power on.

e)After that test whether output voltage of switching power supply is 24V using DC voltage of universal mater. If not, adjust the white knob until displays 24V.

Note: please do not arbitrarily amend electrical cabinet wire line. Our company will be not responsible for those faults caused by any arbitrarily amend.

Section III. Simplex commissioning Training

Unit 1 Mechanical commissioning

1. Review project before test running：

1）Adjust bobbin rail level.

2）Flyer direction and gear clearance.

3）TC belt in the wheel groove position without twisted phenomenon.

4）Door switches adjusting.

5）Limit switches adjusting.

6）Wiring examination.

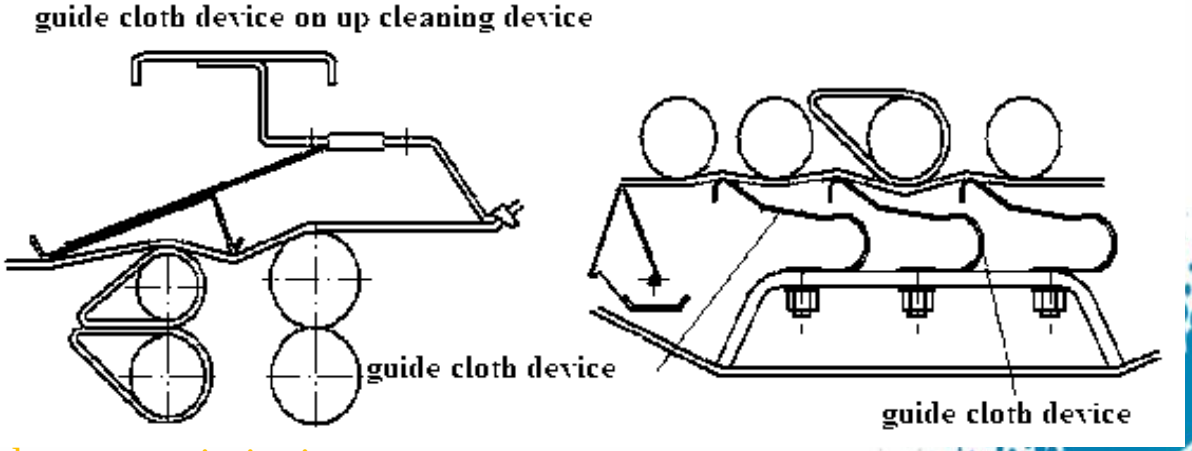
2. Recheck precautions during the test running：

1） Sensors, proximity switch sensitivity.
2） Motor steering.
3） Line safety inspection.
4） The bobbin rail reset and the initial value setting.
5） Inching start and stop button switch function.
6）Weighting arm high and low position inspection.
7）Reinforcement of up and bobbin rail movement reinforcement.
8）Full-roving bobbin automatic falling inspection.
9）Condole belt wheel position, whether to wear band.

If actual spinning spacer don't meet factory, commissioning as below:

Bottom cleaning device commissioning：

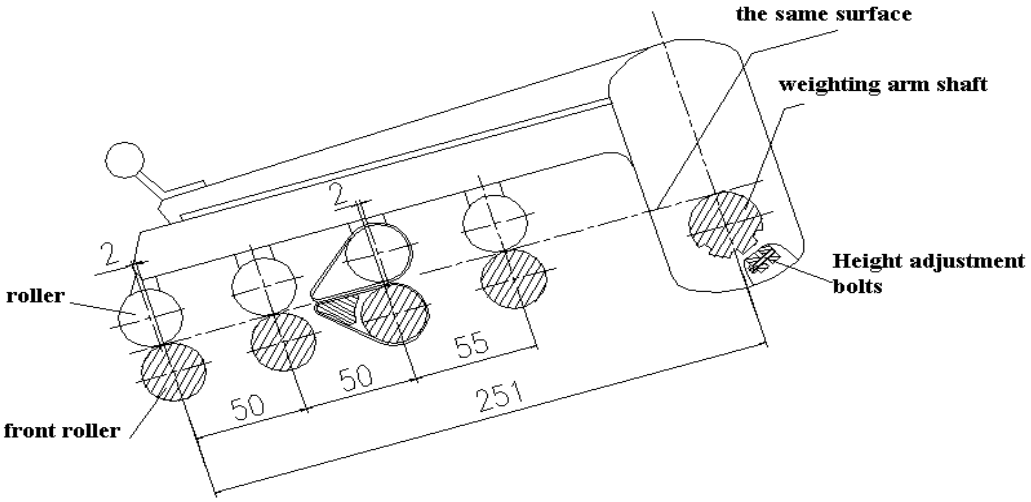
The down clean bearing plate should be adjusted based on the modulated roller gauge regulation. Transfer the wool bearing plate to the two roller intermediate position, and ensure the bearing plate and roller parallel to make velvet strip surface curve form.



The up clean commissioning：

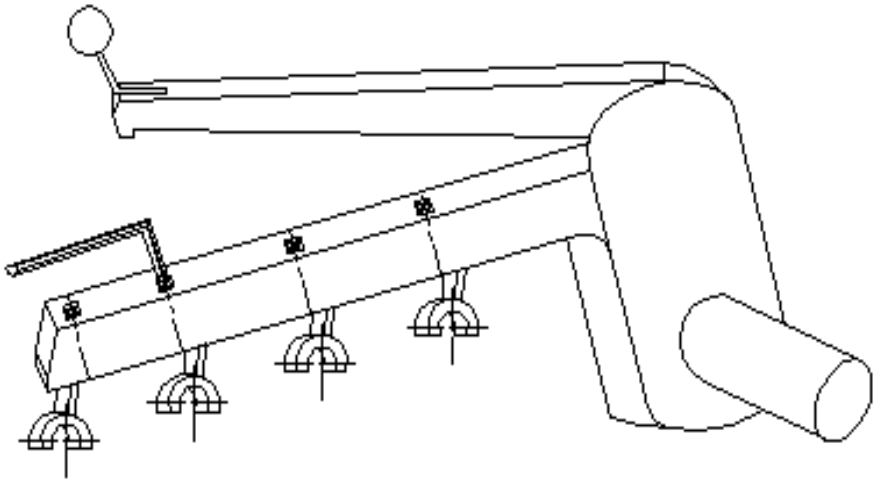
The velvet strip is faced with the apron up pin back guide bar to ensure that each velvet strip is in up pin grooves. Adjust back guide bar to make velvet strip elasticity suitable. Front and back guide bar should be parallel with each other. The spring pressure plate in up velvet is adjusted according to the roller center distance, there is a circular contact between velvet and up and down roller and up apron, otherwise it won’t work.

How to comissioning of weighting arm



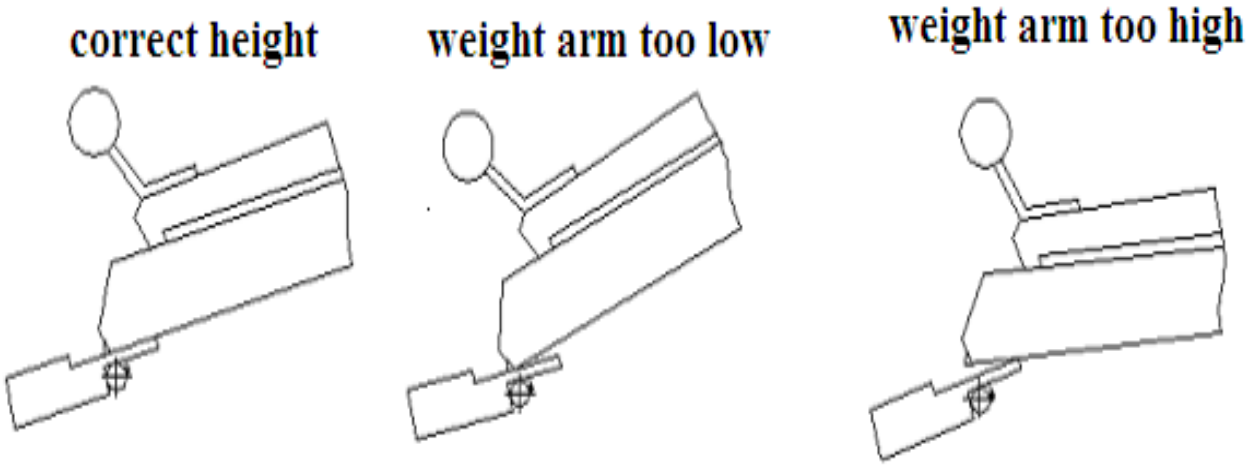
YJ4-190 x4 type weighting arm (TEXPARS - PK1550, pneumatic weighting of rollers, plate saddle weighting, end's plate saddle weighting choose) is fixed in two roller frame, to guarantee the weighting arm shaft center to the front roller center distance for 251 + / - 0.10 mm (of other types of weighting arm see specifications), weighting arm shaft bus and roller bus are in the same plane within (∠35 diameter roller except).

How to comissioning of



Install the roller into weighting arm jaw, visual left, right position is in the roller pattern center. according to the technical requirement , adjust roller gauge, use pressure weighting arm to adjust draft area separation, as long as take one accurate roller gauge as standard, the roller gauge of the rest of the weighting arm can be adjusted

How to comissioning of



Height adjustment: fastening all up rollers, placed height adjustment spacing, and the height positioning screw to adjust height, After the adjustment, repeat to press the weighting arm2-3 times, then use highly spacing to measure again (regulation, the pressure transducer turned to green side).

***Special tools required:**

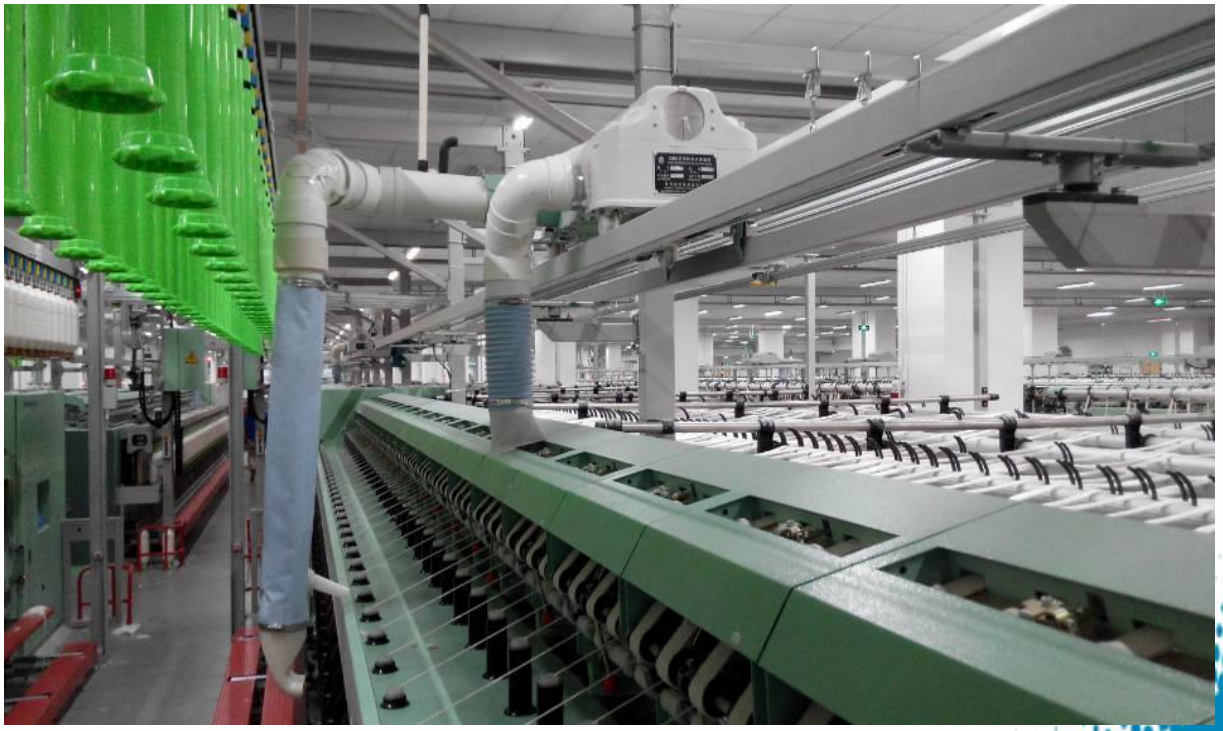
Spacing initiating T16, front roller initiating T15, regulating wrench T26.

How to comissioning of doffing frame?

Doffing frame is key part component to realize automatic doffing. The principle is that tailstock motor reducer drives reverse steel strip on which blue and yellow bobbin distributes uniform at half space.

The stainless steel belt will stretch according to temperature. When the phenomenon of steel slipping occurs, the head and tail bolts should be adjusted at the same time. Tension as standard as non-slip. Too tight will damage steel also unstable

How to comissioning of



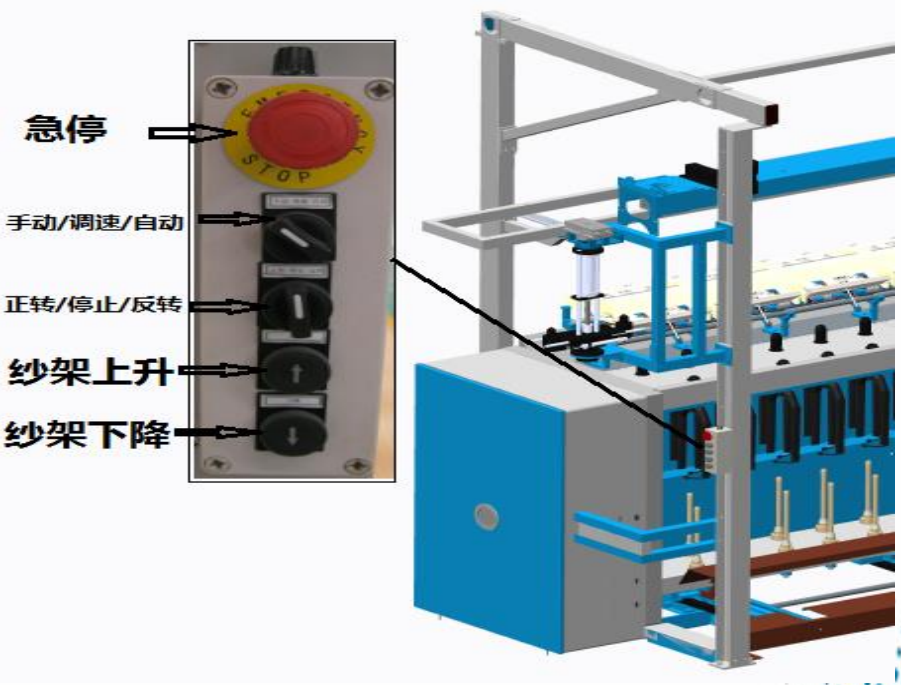
Doffing mode is divided into two types:

1）automatic doffing：the roving manipulator in frame rear realizes full bobbin and empty bobbin swap, through the transfer orbit deliver full bobbin to roving library, at the same time change weight group orbit hole bobbin to doffing shelf, the doffing mode is suitable for workshop equipped with weight league system.

The manipulator has been assembled in the factory, fixed in the rear of the frame guide pillar support, adjust roving palm rest distance, to ensure the doffing action for accurate.

2）Manual doffing:

Suitable for those without roving-ring link ststem, method shown as below.



1) Transfer the button selector switch to the manual;
2) Press down button, adjust roving stand height (which determined by the worker's height);
3)Then worker can take roving and put bobbin in conveying car.
4)After doffing is completed, press the up button to raise the doffer to the set position.

Note: special attention should be paid when doffing manually.

1)The doffing frame should low down to position where operator is easy to operate, at the rear position when doffing manually.

2)It is suggest not to doffing anyplace in front of machine to avoid dropping roving into pedal and bobbin rail or damaging machine by rotating bobbin.

Unit 2 Electrical commissioning

1. Power on sequence:

First turn on main switch QF1.1➡then QM2.1/ QM2.3(suction motor and cooling motor protection switches)、➡QM2.2 (top cleaning protection motor switch) every motor switches、➡QF9.1(main transmission power switch)、➡ QF10.1(auxiliary transmission power switch)、➡QF11.1(lifting motor power switch)、➡ 12.1(roller motor power switch) 、➡ then QF3.1(control power switch).➡Turn on QM 18.1(rail remove out motor switch),➡QM19.1 (doffing frame lifting motor switch),➡ QM20.1 (doffing frame reverse motor switch),➡ then QF18.1 (holding brake switch).

KM6.1 contactor is closed, lifting inverter is powered on. The cabinet fans get started, power supply G4.1 is powered on, interface displays, PC in running condition.

Test supply voltage:

Check whether each voltage meet request after power on, observe whether switch power G4.1 indicator lamp is on. If the switching power supply alarms, or indicator lamp does not illuminate indicating that there is a short circuit fault in external.

Power supply input voltage:	AC 380V/220V
Control power voltage:	AC 220V
Photoelectrical sensor voltage:	DC 24V
Hall sensor voltage:	DC 24V
Indicator input voltage:	DC 24V
Encoder voltage:	DC 5V

Speed test hall sensor adjust:

Roller speed test adopts hall sensor with magnetic iron as sensor body which inlaid in roller axis. When the sensor lamp together with input indicator of FX3U-PC is on indicates that signal had been received transfer from sensor. Please note pole of magnet iron, reverse it and recalibrate if indicator is not light on.

Photoelectric sensor adjust:

1、Yarn breakage photoelectric、sliver breakage photoelectric and fly yarn photoelectric: After installation, power it on, adjust sender and receiver position to ensure yellow indicator on receiver is brightest and in best place. Tighten photoelectric to avoid loosen.

2、Doffing frame photoelectric、vertical column photoelectric and guardrail photoelectric: After installation, power it on, adjust sender and receiver position to ensure four red indicator on receiver is on. Tighten photoelectric to avoid loosen.

Proximity switch adjust:

1、When the distance is too far between the proximity switch and TC belt of doffing frame, the red indicator of proximity switch will power on. Meanwhile, PC of series Q and C indicator of A24.1 will power on. Doffing frame cannot move up and down.

2、When the distance is too far between the proximity switch and bobbin rail, indicator of proximity switch will power off. Meanwhile, PC of series Q and A indicator of A24.1 will power off. No signal input in 24XA. Bobbin rail cannot move out by automatic/manual.

Gate switch test:

When open the gate, machine stops. Blue indicator lights on, meanwhile, X17 on FX3U-PC powers off.

Motor rotating direction adjust:

1）Main and auxiliary motors rotate in same direction.
2）Bobbin rail lifting motor： Press the button, the rail act correspondingly.
3）Roller motor： Anti-clock seen from headstock
4）Suction motor rotates according to arrow indicating.
5）Blow motor rotates according to arrow indicating.
6）Rail horizontally remove motor: Press move in/out button to active cart correspondingly.
7）Doffing frame lift motor: Press the up/down button to active doffing frame correspondingly.
8）Doffing frame reverse motor: Press forward button, the inside bobbin holders move to tailstock. Press the reverse button to active correspondingly.

Remark：

1）If the motor rotates error, please adjust two phase of wire on motor terminal.

2）Encoder wire should be in accordance with motor wire. If the motor rotates abnormal, it is workable to change the wire of A and B, anti-A and anti-B. (Alarm information W108 indicates that encoder wire is reversed)

3）If lifting rotates error on condition of normal rotating, it is suggest to change And B, A reverse and B reverse of high speed counting module.

Section III .Concentrated Training

Contents

- a) For workshop managment;
- b) For electrical and mechanical engineer;
- c) For operator;
- d) For maintainance person and repairer;

1.Training for workshop management:

□Check whether operation and maintenance are in accordance with the safety regulations. Security facilities (warning signs, covers, safety switches, etc) must be completely in normal. Those damaged or dropped off, must be affixed immediately.

□ If the material to be processed contains those which may affect health to operator, necessary precautions should be taken.

□ Set up an operating instruction for operator including at least safety regulations to country and requirements to operator.

□ Be sure to instruct the operator to switch off the machine through main switch when changing the batch.

□ Be sure to take precautions against noise:

noise > 85 dB (A), an earpiece must be provided, which must comply with DIN EN 352.

noise> 90 dB (A), a marking shall be made.When working, check whether the operator is wearing noise protection.Measures to reduce noise should be taken.

2. Training for mechnical and electrical engineer

(1) Parameter set training;

(2) Position adjusting training;

(3) Tension adjusting training;

(4) Interface trouble and trouble shooting;

(5) Frequency converter;

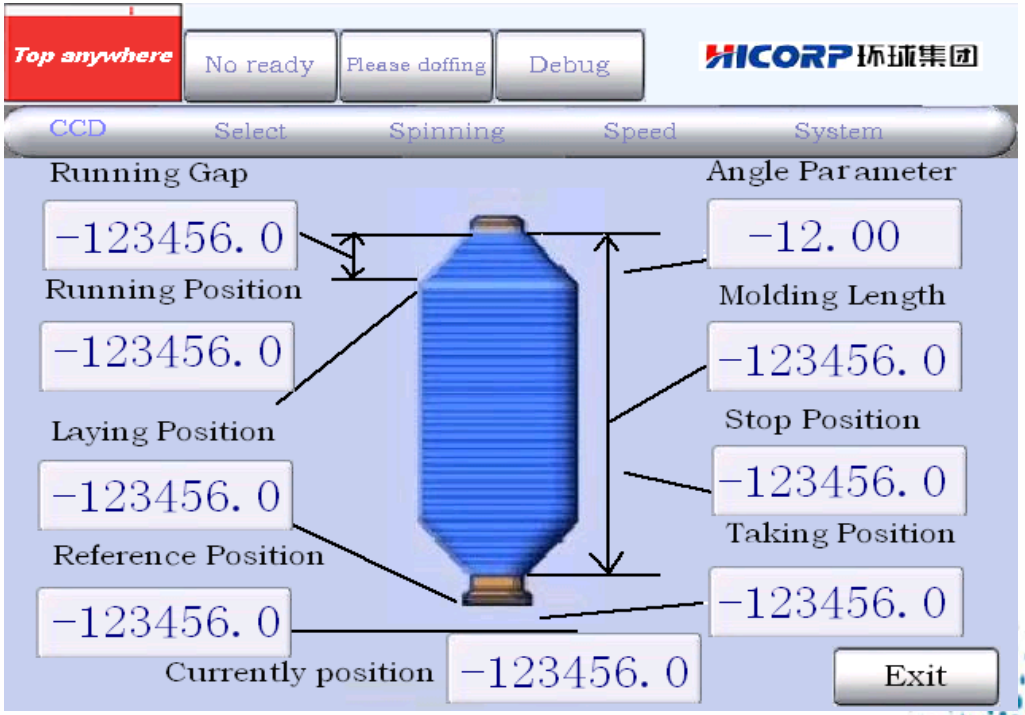
(6) PC fault;

(7) Others.

Parameter seting

"Tensility Para 1" normally 1500 ~ 6000. Reduce the value to tighten, in contract increase it to loose.
"Tension Para 2" range between 2 and 20. If tight, increase this value.
"Tensility Para 3" usually was set as constant 1.
"Foremost para" normally -1400 if the roving is loose, reduce this value.
"Convolate para" adjust winding density(equivalent to lift teeth). The smaller, the tighter roving winding is.
"Twist" set twist value according to the technical requirement.
"Acc adjust para" period when flyer speed from "0" to set value.If roving is loose, increase the set value.
"Dec adjust para" period when flyer speed from set value to "0". If roving is loose reduce the set value.

Forming process setting:



"Running gap" : When spinning start, rail begins to fall, distance from "running position" to "Down position". That is the vertical length of the first layer roving winding on bobbin.

"Running position": Flyer presser reaches to position of fiber belt on bobbin, the rail position now is the running position.

"Laying position" : The current position data when rail reaches laying position. For this type simplex, running position and laying position in the same position.

"Reference position": 80000

"Angle parameter" : Set value to prevent roving pop up phenomenon in spinning.

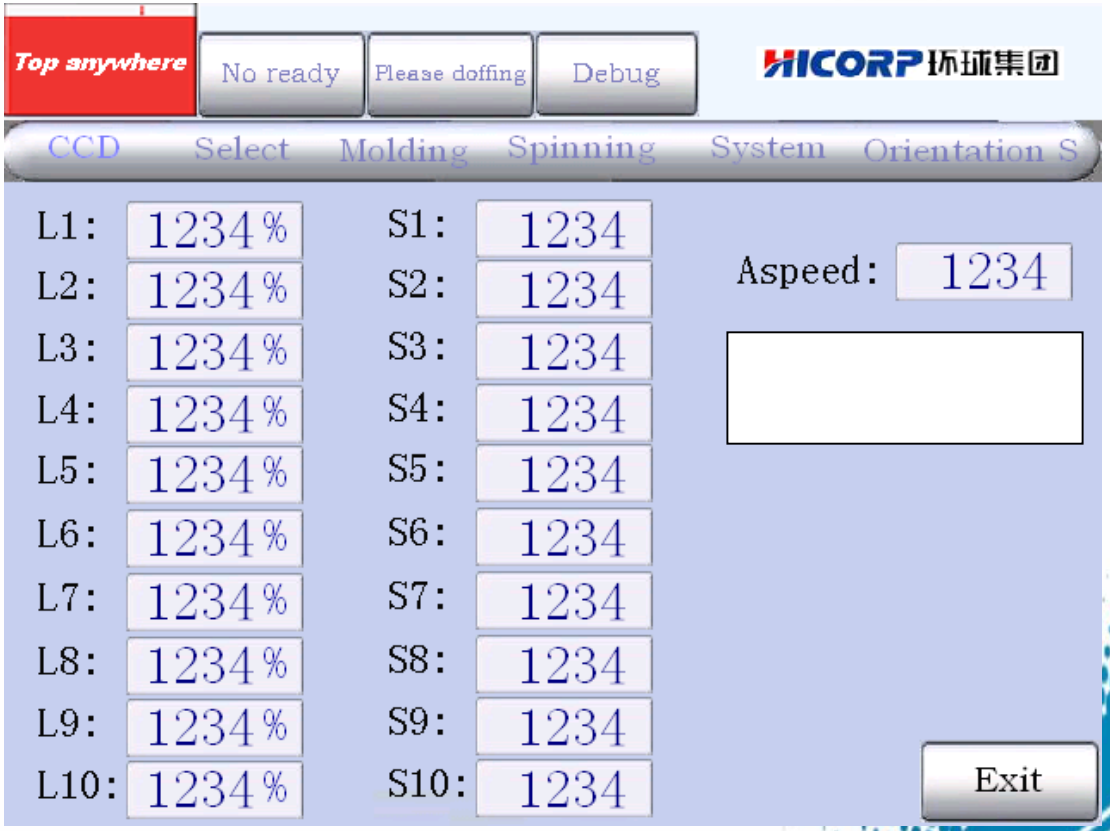
"Molding length" : Max length of roving winding on the bobbin, normally set to 370000.

"Stop position" : The rail position stopping for full package. Adjusting the position is apt to break roving.

"Taking position" : The current position data when the rail rises to taking position.

"Currently position" : Displays the rail current position data in the rail running.

Spinning speed:



L1~L10 show spinning length percentage, it means roving length;

S1-S10 display the related speed in related length range.

Example：If spinning length 3000M，L1 is set to 10%，S1 is set to 700，the speed from 0~300m is 700r/min

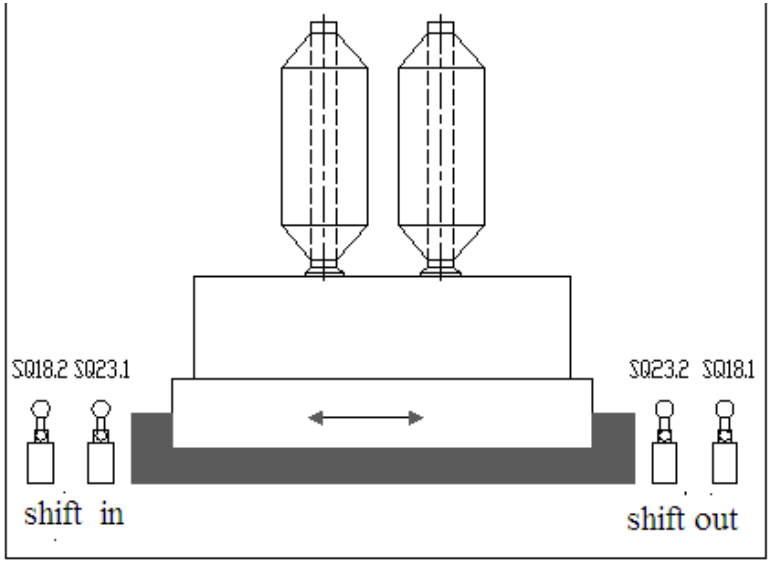
Position adjusting training:

1)Place a bobbin on the bobbin roller;

2) Press  to fall down rail until to 6-10mm between top of lifting bracket hand screw and rail. Currentn rail position is taking position. Return to para seting interface to write down current position data.

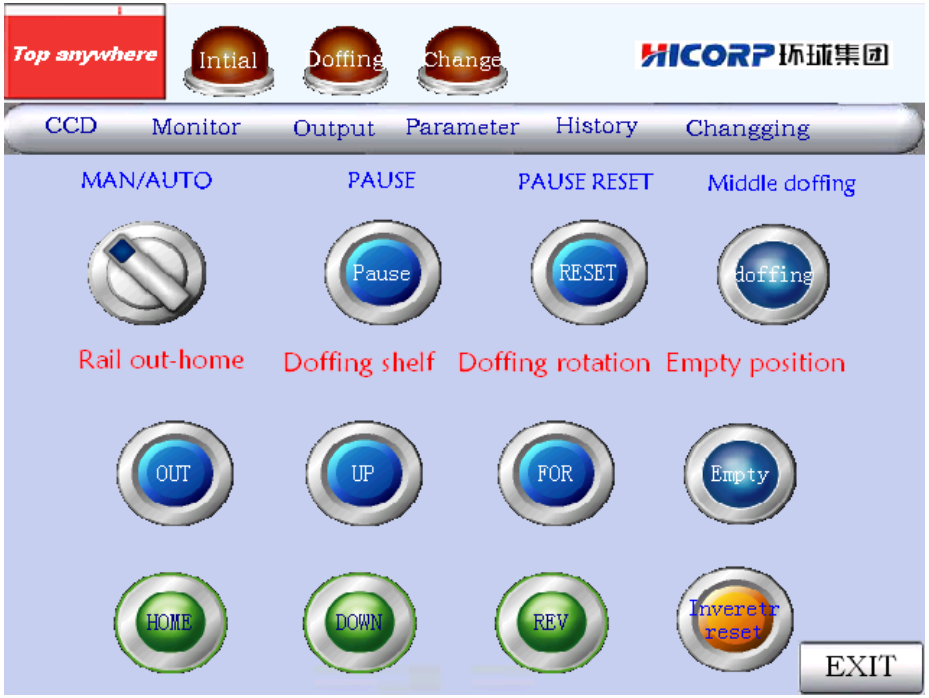
3) Press  to raise rail until presser reaches to upper bobbin velvet,current rail position is running position

Rail move out and move in;



SQ18.1: rail frontal limit switch;
SQ23.2: rail frontal positioning switch;
SQ18.2: rail back limit switch;
SQ23.1: rail back positioning switch.

2. Rail move out and home adjusting:



Press 

, adjust frontal positioning switch SQ23.2 to make spindle center in center of bobbin holder.

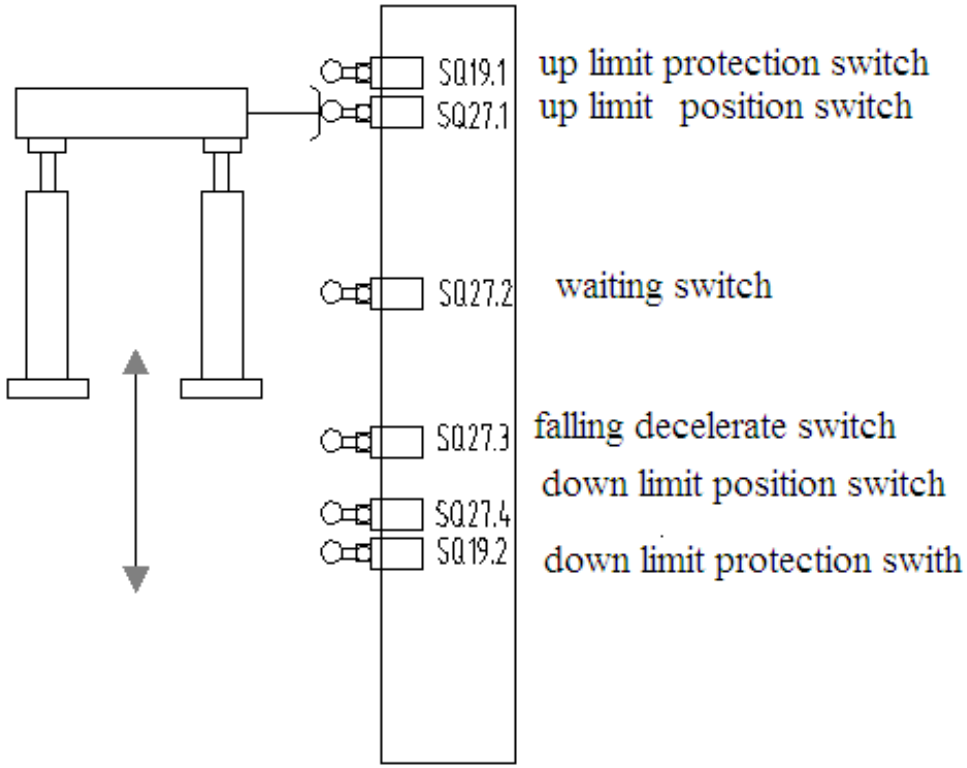
Even if SQ23.2 is damaged, rail will touch SQ18.1 to trigger rail inverter UF18.1 to cut down power.

Press 

, adjust back positioning switch SQ23.1, to make spindle center in the center of flyer.

Even if SQ23.1 is damaged, rail will touch SQ18.2 to trigger UF18.1 to shut down.

Doffing frame adjusting:



Press 

and 

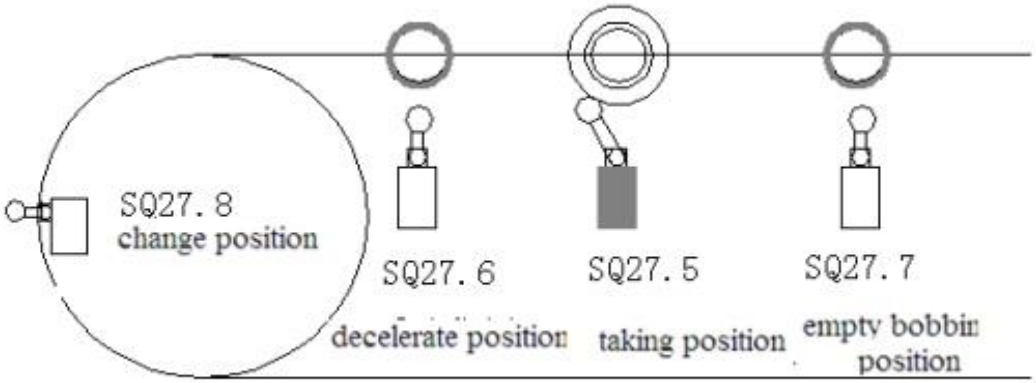
to adjust upper and down position correspondingly.

Nornally yellow bobbin holder is used for full roving bobbin,

blue bobbin holder is used for empty bobbin;

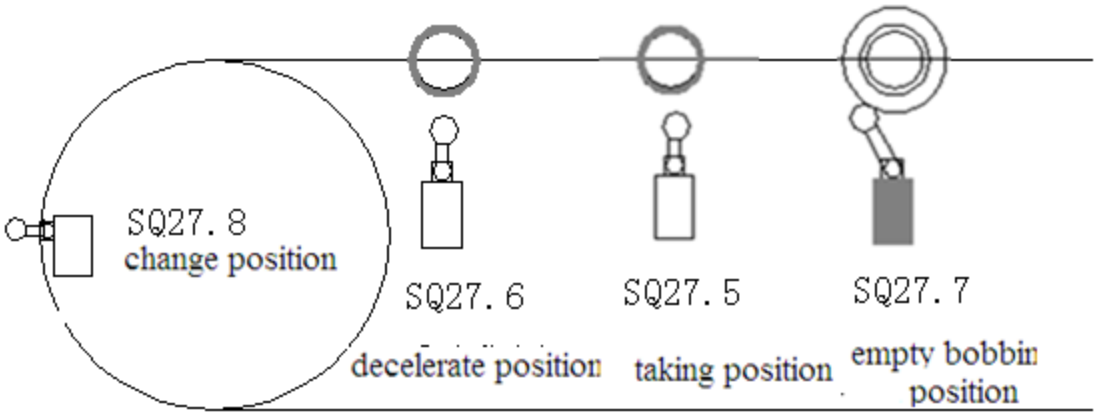
Doffing frame reverse position adjustion:

1) Conveying steel belt in doffing position



Set the position of limit switchSQ27.5，making full-sliver bobbin plug is to spindle center.

2) Conveying steel belt in empty bobbin position

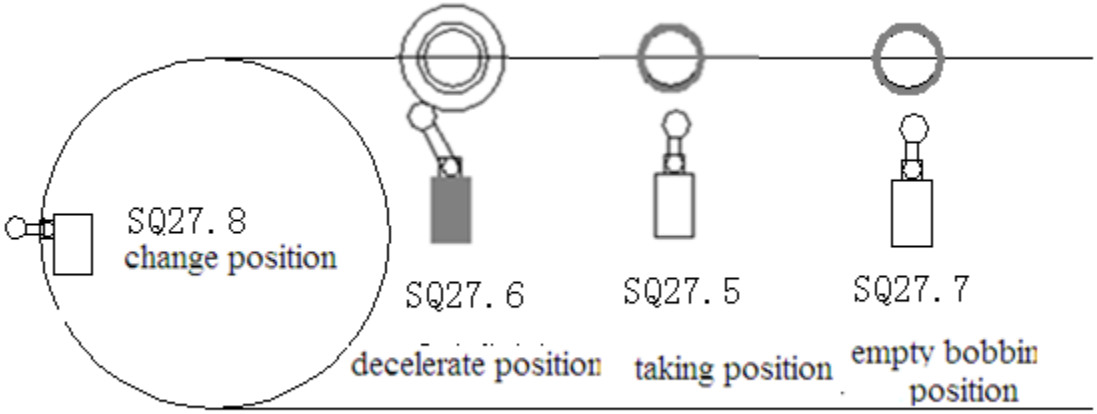


Press 

, to touch limit switchSQ27.7， steel belt stops rotary，

And empty bobbin head is in spindle center position.

Conveying steel belt in reduce position:



Doffing shelf turns reverse to touch decelerate switch SQ27.6. doffing shelf transmission steel belt runs from high-speed to low-speed.

Conveying steel belt in roving changing position:

When roving manipulator is out, doffing shelf turns reverse to meet change position switch SQ27.8, making the doffing shelf bobbin center and the manipulator center consistent.

Photoelectric position:

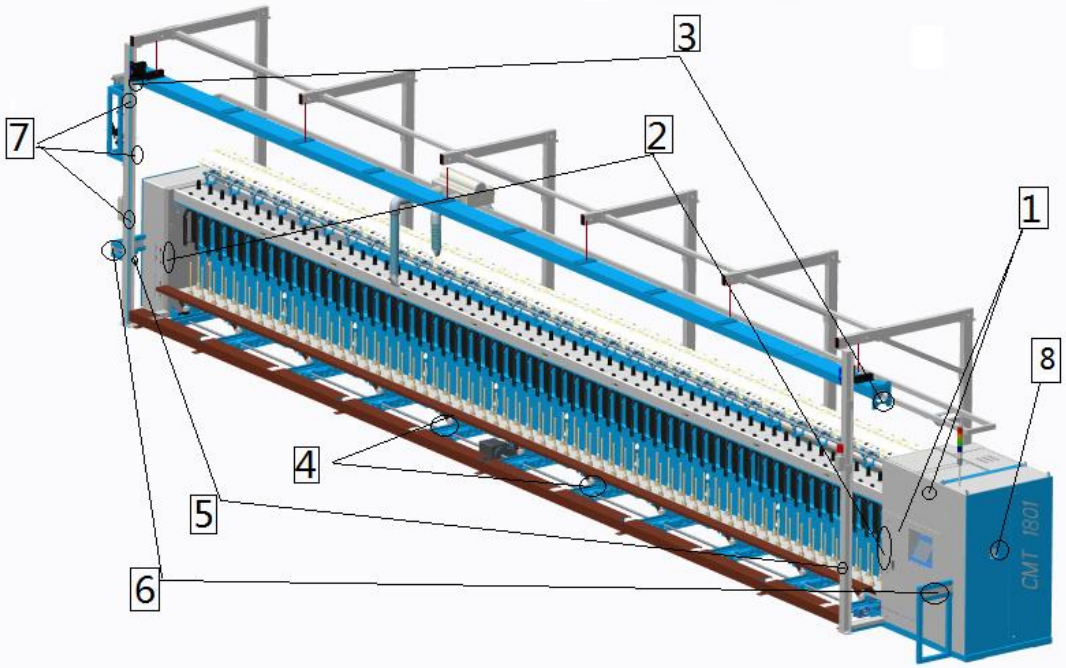
1. Column photoelectric: B32.15: receiver, B32.16: transmitter, shown as ⑤;

2. Guardrail photoelectric: (take full-roving bobbin detection photoelectric)

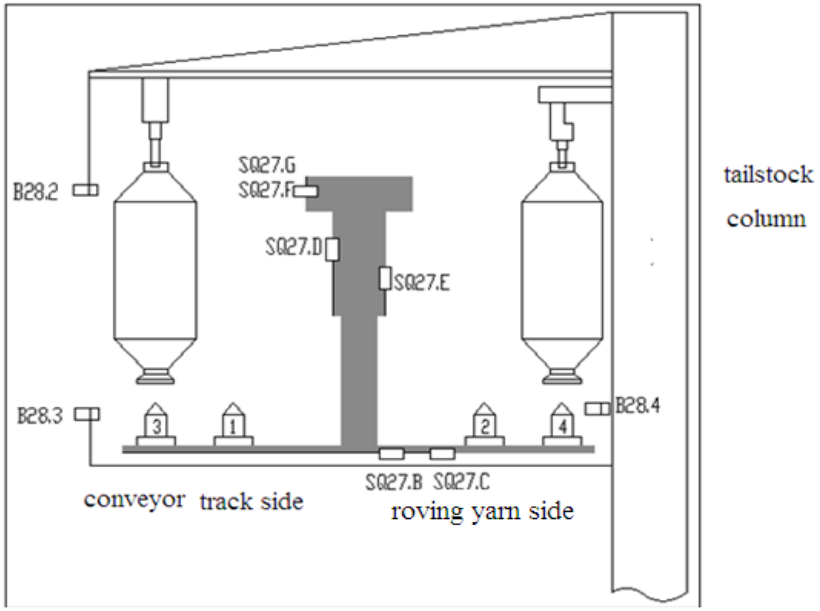
⑥

3. Doffing shelf detection photoelectric: shown as ③;

When doffing shelf falls to SQ27.2, photoelectric (B32.21 / B32.22, B32.23 / B32.24) works.



4. Roving manipulator detecting photoelectric (only available in manipulator)



1) Conveying rail positioning photoelectric:

Adjust B28.2 to make center of bobbin holder on rail above the manipulator positioning column (+ / - 1 mm)

2)Conveying side detection photoelectric:

Adjust B28.3 to make it in the upper part of roving exchange manipulator positioning column.

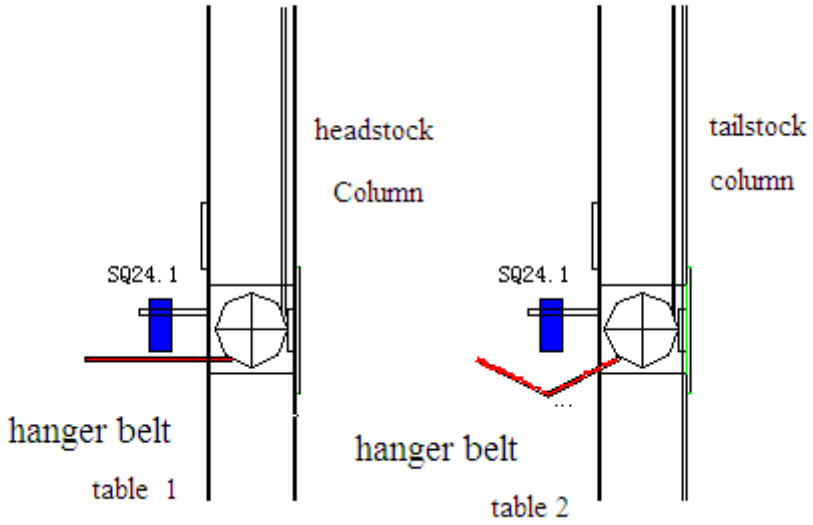
3)Roving side detection photoelectric:

Adjust B28.4 to make it in the upper part of roving exchange manipulator positioning column.

4)Cylinder limit switch:

- Adjust SQ27. B: positioning column shifts out, making the center of bobbin hanger in rail above the manipulator positioning column (+ / - 1 mm),making the center of bobbin hanger in doffing shelf of roving side above the manipulator positioning column (+ / - 1 mm)
- Telescopic cylinder right limit SQ27. C: positioning column inside, the initial position of the cylinder.
- Taking roving cylinder up limit SQ27. D: lifting device up limit, remove, or hang the bobbin in transfer orbit and doffing shelf.
- Taking roving cylinder down limit SQ27. E: lifting device at the bottom, the initial position of cylinder.
- Oscillating cylinder left limit SQ27. F: rotary motion to the left.
- Oscillating cylinder right limit SQ27. G: rotary motion to the right, the initial position of the cylinder.

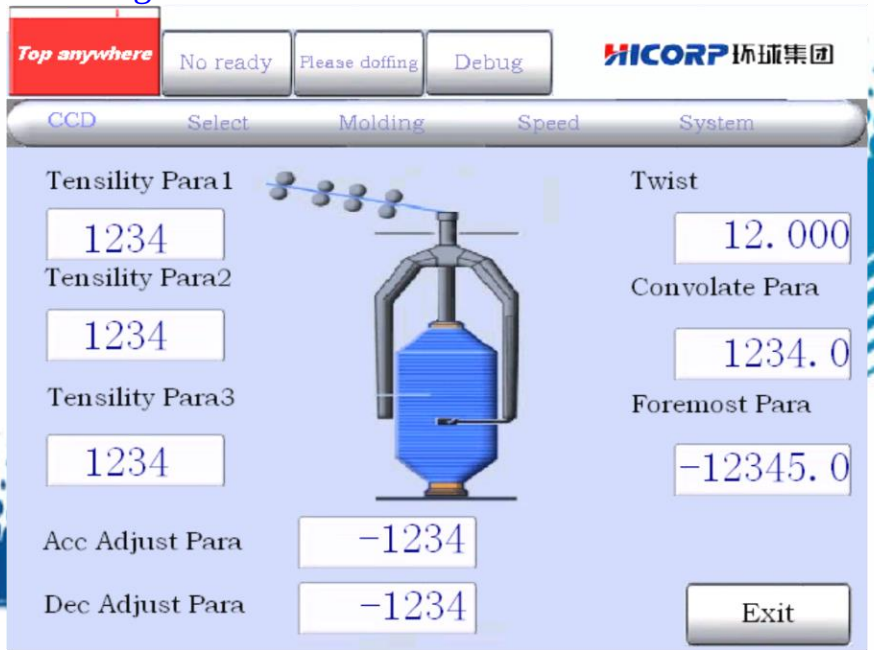
5. Hanger belt preventing loose approach switch



Adjust the distance between approach switch SQ24.1 and hanger belt, make the proximity switch red indicator light go out, the distance between approach switch and hanger belt is around 5 mm to 8 mm. Under normal circumstances should be as shown in picture1, only when hanger belt is tightened, approach switch red indicator light goes out, doffing shelf can normally lift ;When appears picture2 in the above ,hanger belt bend or break, approach switch red indicator light turns bright, doffing shelf stopped rising or falling, find fault and eliminate, make doffing shelf lift properly.

Tension adjusting

"Tensility Para 1" normally 1500 ~ 6000. Reduce the value to tighten, in contract increase it to loose.
"Tension Para 2" range between 2 and 20. If tight, increase this value.
"Tensility Para 3" usually was set as constant 1.
"Foremost para" normally -1400 if the roving is loose, reduce this value.
"Convolate para" adjust winding density(equivalent to lift teeth). The smaller, the tighter roving winding is.
"Twist" set twist value according to the technical requirement.
"Acc adjust para" period when flyer speed from “0” to set value.If roving is loose, increase the set value.
"Dec adjust para" period when flyer speed from set value to “0”. If roving is loose reduce the set value.
" Tensility ", "layer" " coefficient"
Means when roving layer reaches to setted number X,"tension coefficient" set to Y. other tension adjustment is as above. Fine turning method. tension coefficient is usually set to 10000.
“Start adjust layer” : If roving tension is increased from one layer, write down this layer no. into this parameters.
“Adjust delay time”:After reversed and arrived at setting time, write down tension data to complete adjusting to prevent tension changing when reversing.



3.Training for operator:

1. Safety trainning as before;
2. How to doffing (automatically and manually)?
3. How to exchange roving with manipulator?

4.Training for maintanance person and repairer:

Contents

- a) Maintainance ;
- b) Running-in period maintainance ;
- c) Lubrication ;
- d) Electrical components maintainance ;

General plan:

1.Daily mantainance.

2. Machine cleaning.(Every 12 days interval).

3. Machine inspection (every 20 days interval).

4. Total inspection and repair (every 3 month interval).

5. Leveling partly. (every 6 month interval).

6. Complete leveling (every 3 years interval).

Running-in period maintenance:

A、New machine run-in period no less than 1 month, technical speed between 700-900r/min.

B、After 100 h running, recheck flyer, bobbin transmission axis connecting sleeve loose or not.

C、After 100 hours running, replace the grease. Pollution may result in run-in period.

D、After run-in period, technical speed normally within 1200r/min, economic speed is 1100-1200r/min. Then carry out maintenance and lubricating strictly according to manual.

E、Surrounding temperature exceeds appropriate temperature of spinning, reduced speed to compensate for the undesirable effects on machine.

F、The weight arm adjust should be strictly according to instructions required, otherwise it will damage weight arm or even cause roller crack and break by fatigue.

G、When species changing, adjust the roller spacer, make sure that the radial run-out of each roller is less than 0.05mm. The gear meshing clearance with the roller head should be adjusted after the roller head section is fixed. Otherwise, it is opt to cause eccentric running, mechanical wave or roller head fracture and other failures.

H、The meshing clearance of transmission gear should be adjusted regularly.

I、After long period of stopping especially in low temperature surroundings, restart machine in low speed for three hours. Then turn into high speed spinning, otherwise, overload current may cause unnecessary damage to machine.

Maintenance for reducer:

Item	Date
Inspect oil temperature	Every day
Inspect abnormal noise	Every day
Inspect oil level height	Every month
Inspect leakage	Every month
Inspect water in oil	400 working hours later, at least annual
Clean the oil filter	Every 3 month
Clean the ventilation cap	Every 3 month
Inspect fasten screw bolt	When Oil changing
Inspect reducer completely	About every 2 years together with oil changing

Oil specification of each part

Location	Lubricants, grease specifications
Surface bearing	N32
Drive chain	N100
General bearing	2# calcium grease
Roller	3#Lithium grease
Down roller bearing	2# calcium grease ZG-2
Opened type gears	Composite calcium grease
Automatic lubricating pump	00# grease
Universal shaft joint bearing	3#Lithium grease
Reducer	ISOVG320

Electrical components maintainance:

Clean electrical cabinet

Check the fasten screw

Check power protective switch

Inspect voltage

Inspect the button box

Cooling fan in cleaning motor.

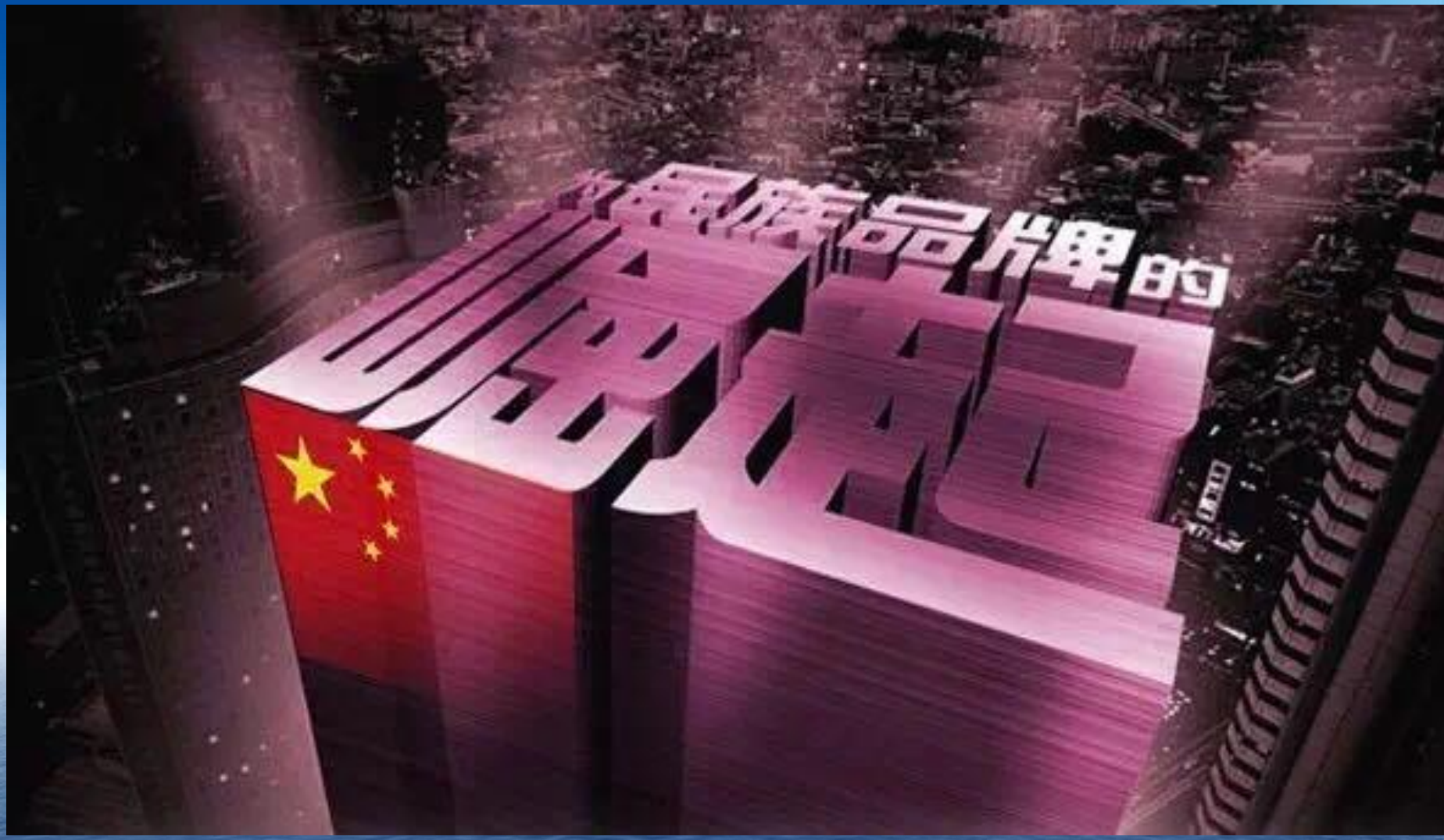
Encoder inspection

Inspect wiring trunking in headstock and body

Note:

It is advisable to turn off the power supply during maintenance and carry out safety precautions.

Thank You !



HICORP MACHINERY (QINGDAO) CO.,LTD.

FA497/498 Computerized Roving Frame

Hicorp Machinery (Qingdao) Co., Ltd.

Content

Summary

- We built the first suspension high speed Roving Frame of China in 1988, sucessfully developed four motors Computerized Roving Frame in 2001，which is one of the earliest Computerized Roving Frame manufacturing factory in China.
- With the development of textile technology, the Roving frame which former drived by single frequency converting motor has been changed to four frequency converting motors drive mechanism, to realize electric distributed control, also to simplify structure of the mechanism driving system, meetting demand for market. Due to this special requirement，Roving Frame operating 24 hours continuously and working all year. Synchronization and reliability of each motor is very important for roving frame during the four frequency converting controlling.
- We former adopted two converter and two servo motors, but it is very complicated with high cost, having no competition in market. After long term testing, we chose Italy CMT production F5 - M series inverter which has been widely applied in the textile industry, especially with successfully application in imported Europe textile machinery. the series inverter adopts asynchronous servo control method with high control precision and reliable quality, which can effectively control the difference of Roving elongation rate and the elongation rate between each spindle. This series of frequency converter increased stability and reliability of machine operation, reduce the failure rate to a minimum level.

FA497/498 Roving Frame Intruduction

FA497/FA498

四轴联动电脑粗纱机

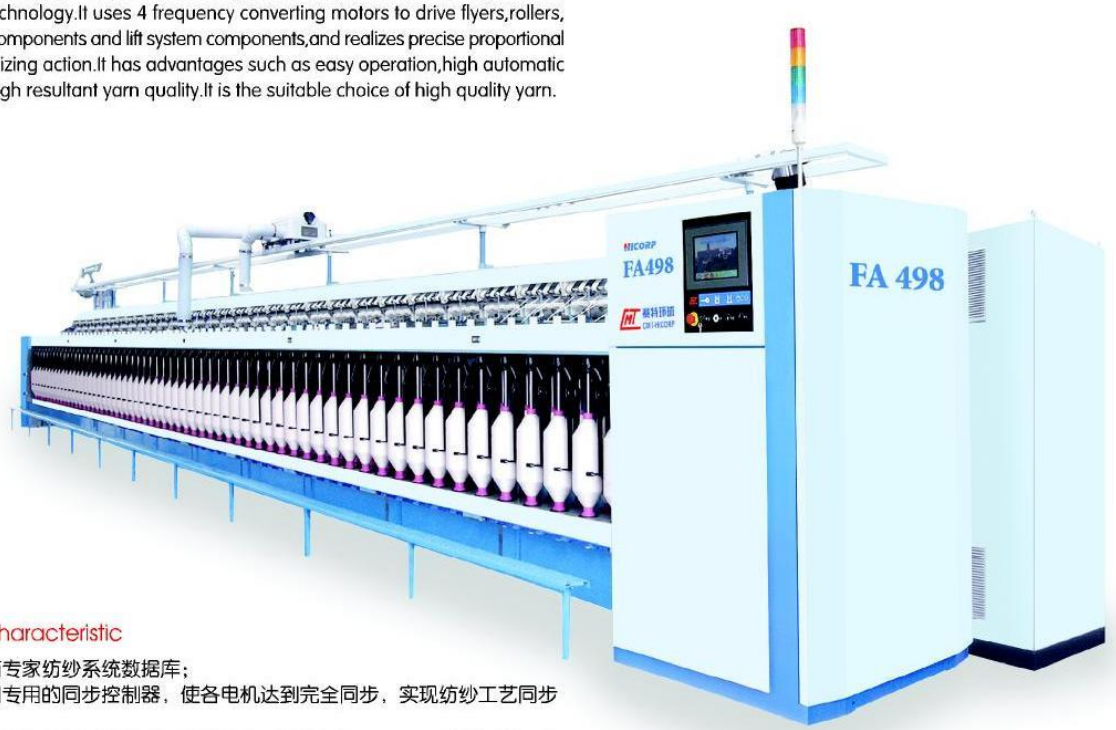
FA497/FA498 Four Axial Computerized Roving Frame

更先进、更简单、更人性化

More Advanced Much Easier More Human

FA497/FA498电脑型粗纱机，采用先进的电脑控制技术，四变频电机分别驱动锭翼、罗拉、卷绕、升降系统，实现了四大运动系统的同步匹配，操作简单，自动化程度高，成纱质量好，是纺制优质粗纱的最佳选择。

FA497/FA498 computerized Roving Frame adopts advanced computerized control technology.It uses 4 frequency converting motors to drive flyers,rollers, winding components and lift system components,and realizes precise proportional synchronizing action.It has advantages such as easy operation,high automatic degree,high resultant yarn quality.It is the suitable choice of high quality yarn.



特 性 Characteristic

具有专家纺纱系统数据库；
采用专用的同步控制器，使各电机达到完全同步，实现纺纱工艺同步匹配；
锭翼和筒管采用齿轮或同步带传动，转速大于1600r/min,传动平稳、噪声低、效率高；
预留网络化接口，可实现远程控制；
具有断电保护装置和恒张力纺纱系统；
停车锭翼自动定位，便于工人接头，始纺防跳管功能；
具有自动润滑系统，大大减轻了工人的劳动强度；
具有锭翼智能变速程序，使纺纱速度大大提高。

Specialist spinning system database;
Special synchronous controller, make every motor synchronize completely ,and realize Spinning technology match synchronously;
Gear or timing belt is adopted to drive flyers and bobbins, the running speed is more than 1600 r/min, transmission smooth, lower noise, high efficiency;
Network management can realize long-distance control;
Sliver breakage protection system and constant tension spinning system;
Power off flyer auto-orientation ,easy to operate;
Automatic Lubricating system greatly decreases work intensity.
With flyer intelligent variable speed program, the spinning speed is greatly improved.

Model FA497/FA498 Computerized Roving Frame simplified the differential gear system and twist change gear on basis of FA493/FA494 roving frame,Adopts 4 frequency motors to drive rollers, flyers, bobbins and bottom rail lifting,and realizes precise proportional synchronizing action. It has advantages such as easy operation,high automatic degree,high resultant yarn quality compare with three motors drive control.

Accordig to user's demand, the four motors can choose a servo motor, two servo motors, three servo motor or full servo motor drive. Equiped with auto lubricating unit, automaticl lubracating with fixed time and quantity.

This structure is the most advance model for the four motors drive roving frame in domestic and aboard.

MODEL：	FA498	FA497
Spindle：	220mm	194mm
Spindle number：	96.108.120.132 .144 .156	96.108.120.132.144.156.168.180.192
Pitch：	440mm	388mm
No.of spindles per section：	4	4
Bobbin dimension：	φ45×445mm	φ45×445mm
Forming dimension：	150×400mm	135×400mm
Drafting multiple：	4.2-12	4.2-12
Twist range：	18-80T/M	18-80T/M

Density for yarn： 200～1250 tex

Drafting system： Four roller short apron drafting system（or choice three roller）

Dia. of Roller： top： 28.8， 28.8， 25， 28.8

(except for TEXPARTS、SUESSEN，or choice by seperate order))

bottom： 28.5，28.5， 28.5， 28.5

Length of fiber：22-50mm four roller，51-65mm（choice by three roller）

Pressing form： YJ4-190×4 weight arm

（Option TEXPARTSF-PK1500 spring weight arm、Pendulum weight arm、Leaf spring weight arm）

FA497/498 Roving Frame Main Technical Parameters

Roller center distance： *Front 35-57mm，Middle 47-68mm，Rear 45-68mm*

Spindle speed： *1600 r.p.m with unload*

Roller stand angle： *15°*

Feeding device： *Overhead guild roller，positive feeding*

Cleaning device： *Positive revolving belt with revolving suction device*

Flyer type： *Close suspension type*

Overall dimension for： *14565×3440×1800mm 13005×3440×1800mm*

120Spindleφ400bobbins

Overall dimension for： *14565×4365×1800mm* *13005×4365×1800mm*

120Spindleφ500bobbins

Beam height： *1400mm*

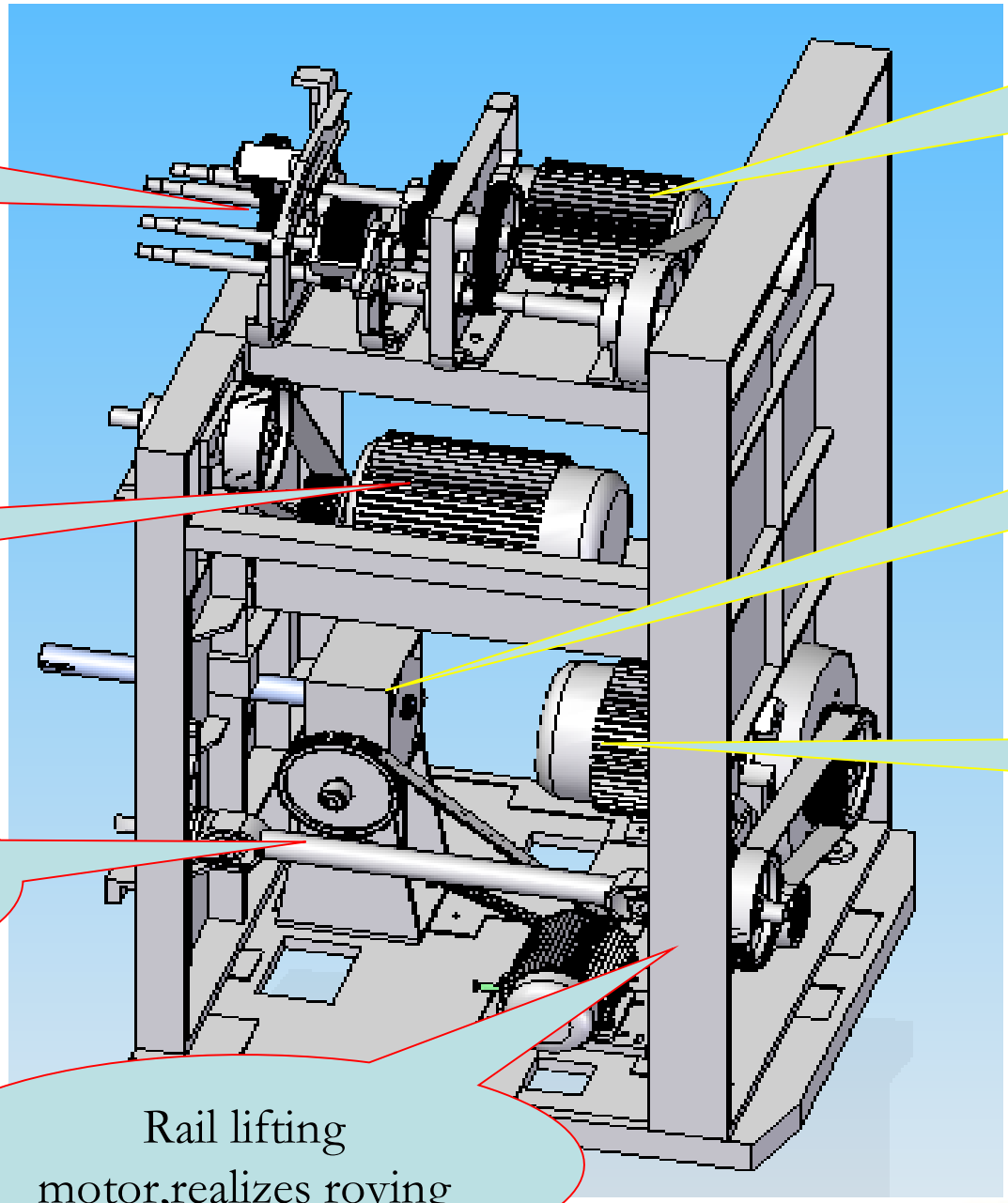
Broken Auto-stop type： *infrared photoelectric control*

Motor start method： *frequency converter adjusting speed in low speed start*

Operating side： *Right hand or left hand*

Main Motor power： *11KW*

FA497/498 Roving Frame Headstock structure



Four roller double apron D type drafting

Roller motor only drive roller , cancel twist change gear

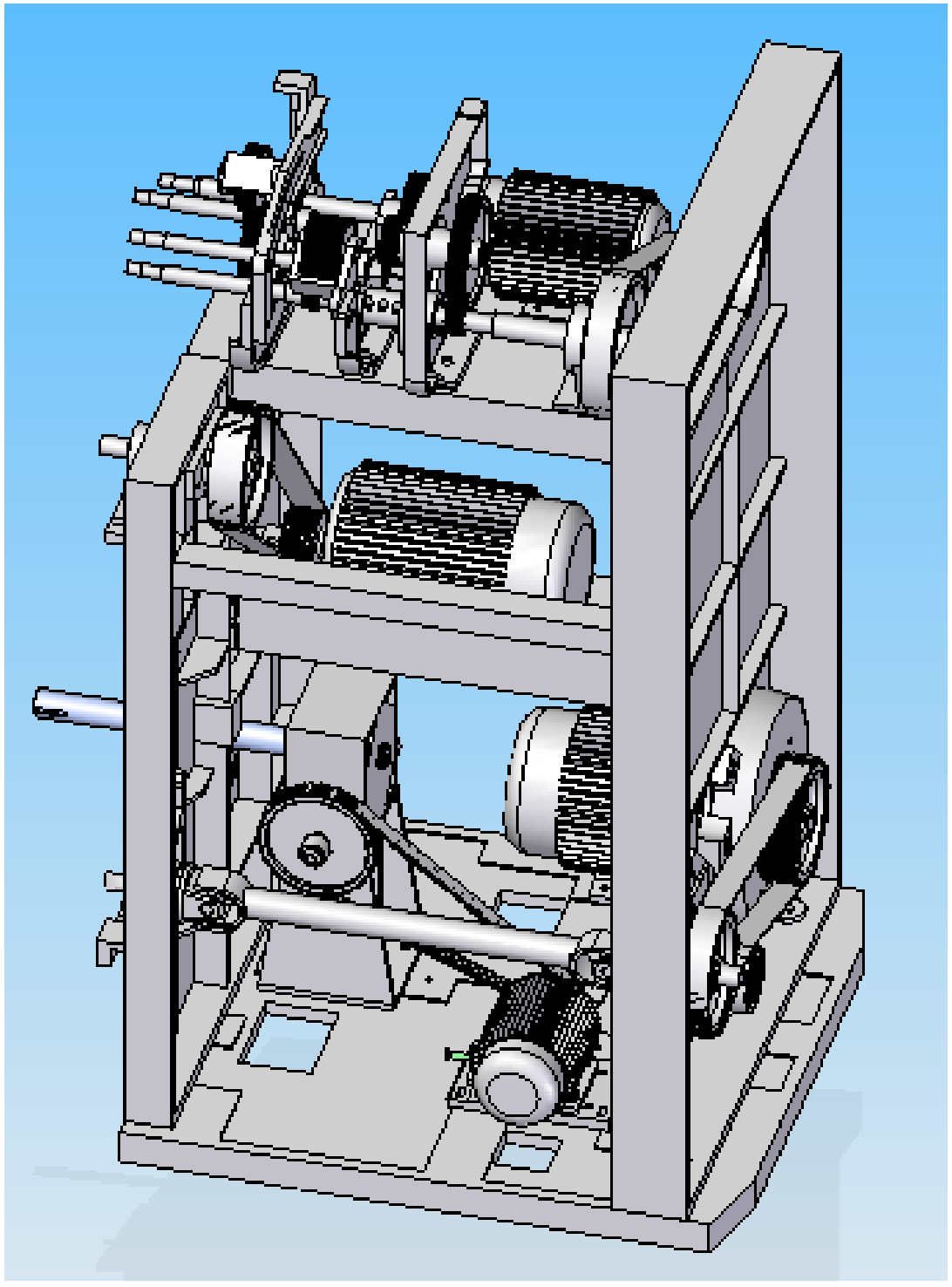
Fly motor,drive flyer rotating

Rail Lifting worm gear reducer

Swing mechanism,adopt universal coupling

Variable speed motor,drive the bobbins

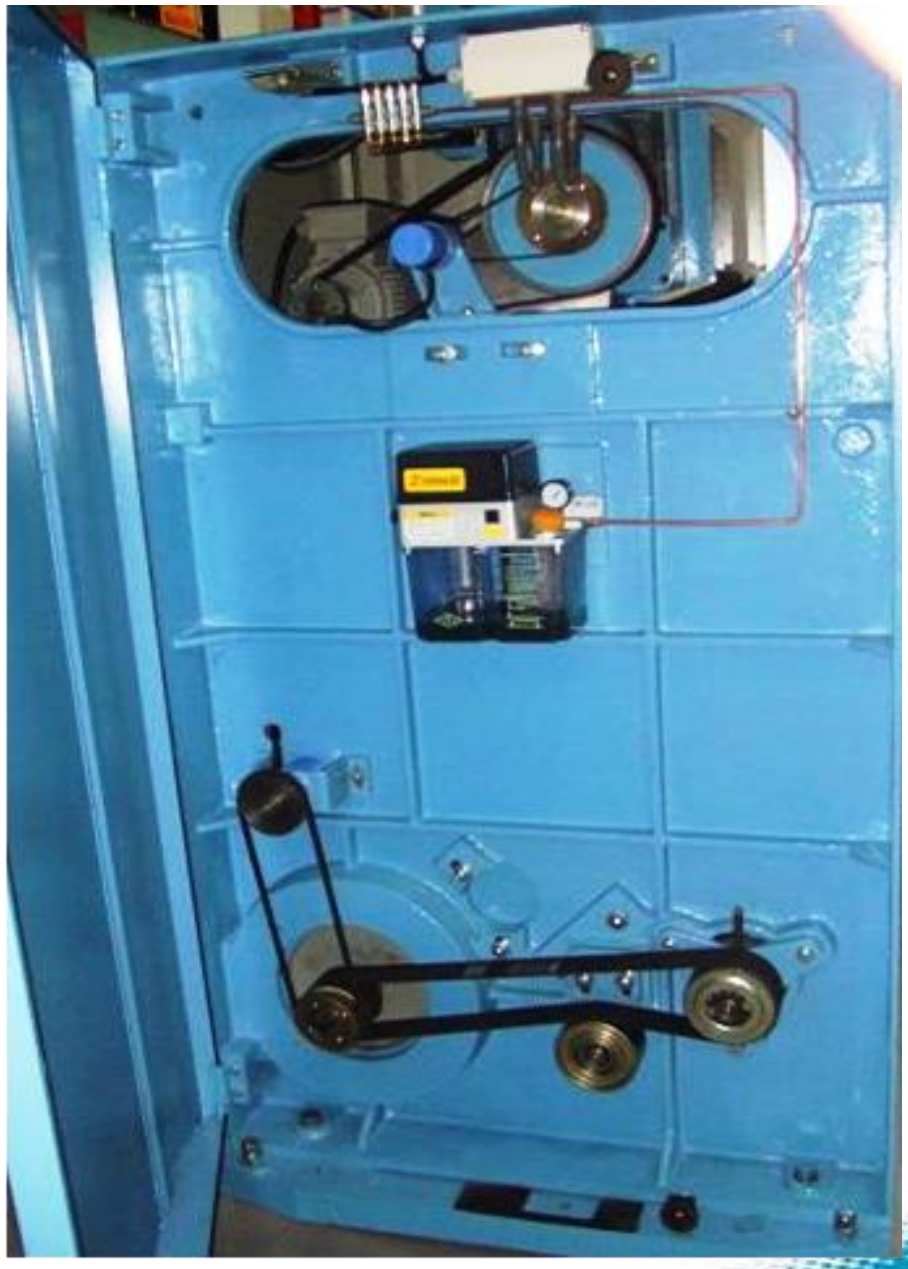
Rail lifting motor,realizes roving forming and change direction



FA497/FA498　　Headstock inner structure

It is simplified the differential gear system and twist change gear on basis of FA493/FA494 roving frame,Adopts 4 frequency motors to drive rollers, flyers, bobbins and bottom rail lifting,and realizes precise proportional synchronizing action， It has advantages such as easy operation,high automatic degree,high resultant yarn quality compare with three motors drive control.

Accordig to user's demand, the four motors can choose a servo motor, two servo motors, three servo motor or full servo motor drive. Equiped with auto lubricating unit, automaticl lubracating with fixed time and quantity. This structure is the most advance model for the four motors drive roving frame in domestic and aboard.



FA497/498 Roving Frame Flyer & Bobbins drive method

Synchronous belt drive control adopts our own patent technology， research and developed high speed gear box with oil bath lubrication， max speed of spindle up to 1400r/min, without lubracating in one year. It obtained National Patent, the patent no is ZL03217470.5。

Flyer、 winding section adopt bevel gear drive

Flyer、 winding section can choice circle arc tooth Synchronous belt drive

Charactors： gear by antimony machining for high speed rotating

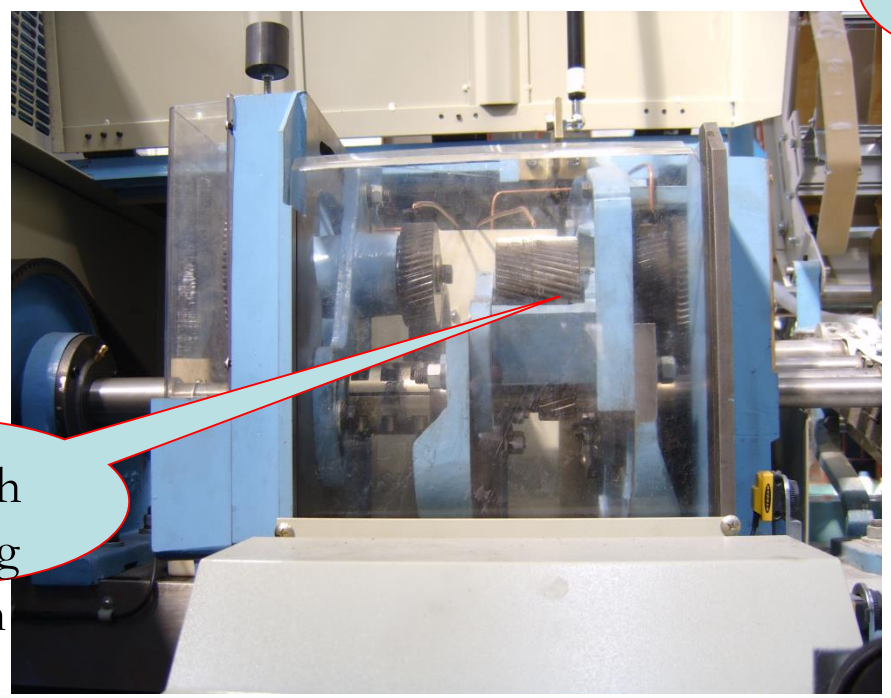
Charactors ： high running speed, low noise, high speed Synchronous belt with low noise.

extend service lift， easy maintainace. Single spindle power less than 45W

3. FA497/498 drating system

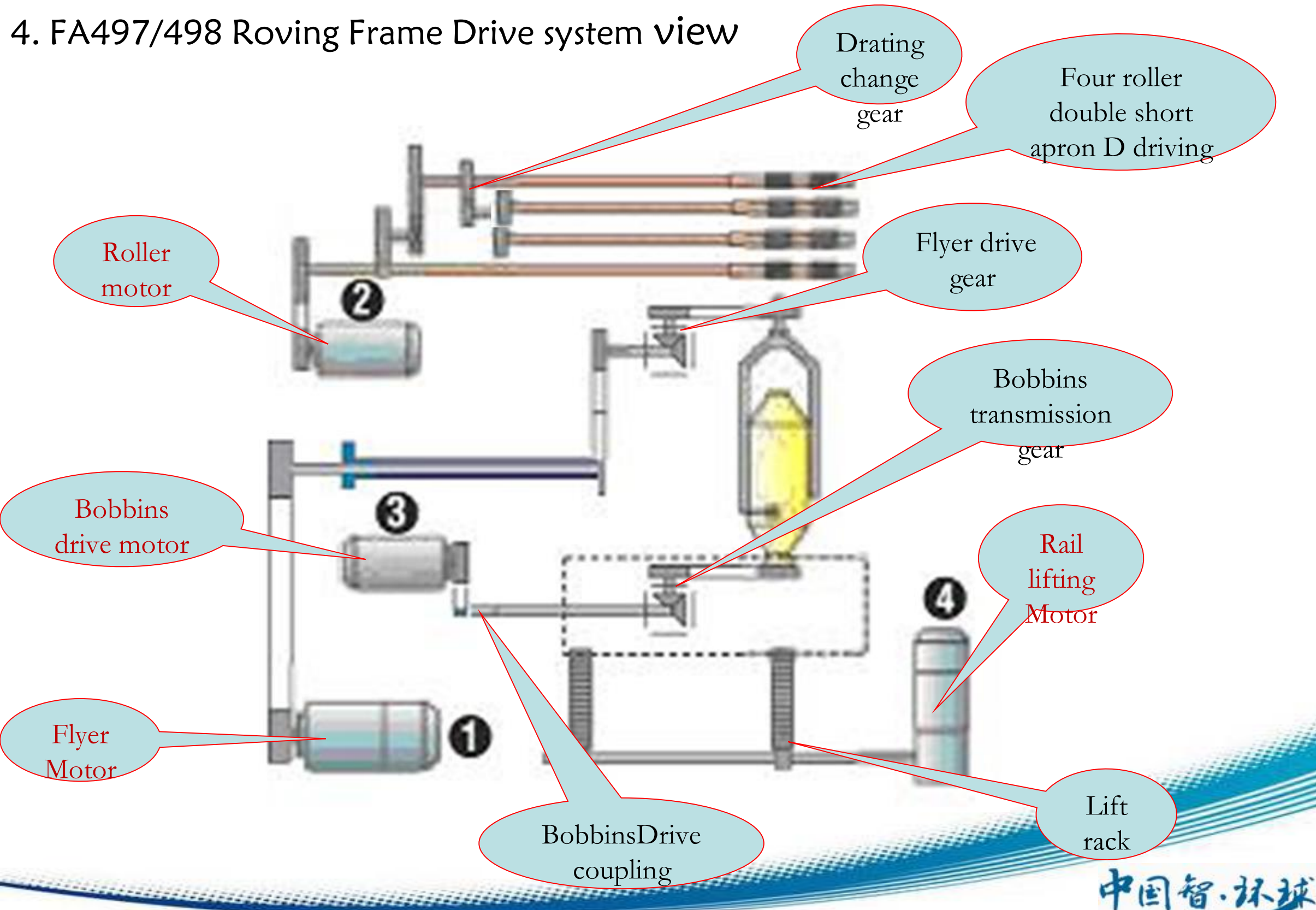
FA497/FA498 Roving Frame drating drive adopts 3KW motor seperate drive with oil bath lubrication, the motor drive the first roller sperately transmitted to second roller and the forth roller with uniform power distribution and smooth drafting. Movement precision of transmission gear, work stability, contacts accuracy is according to sixth precision design, using grinding process to ensure the spinning process requirements

Automatic lubracting system

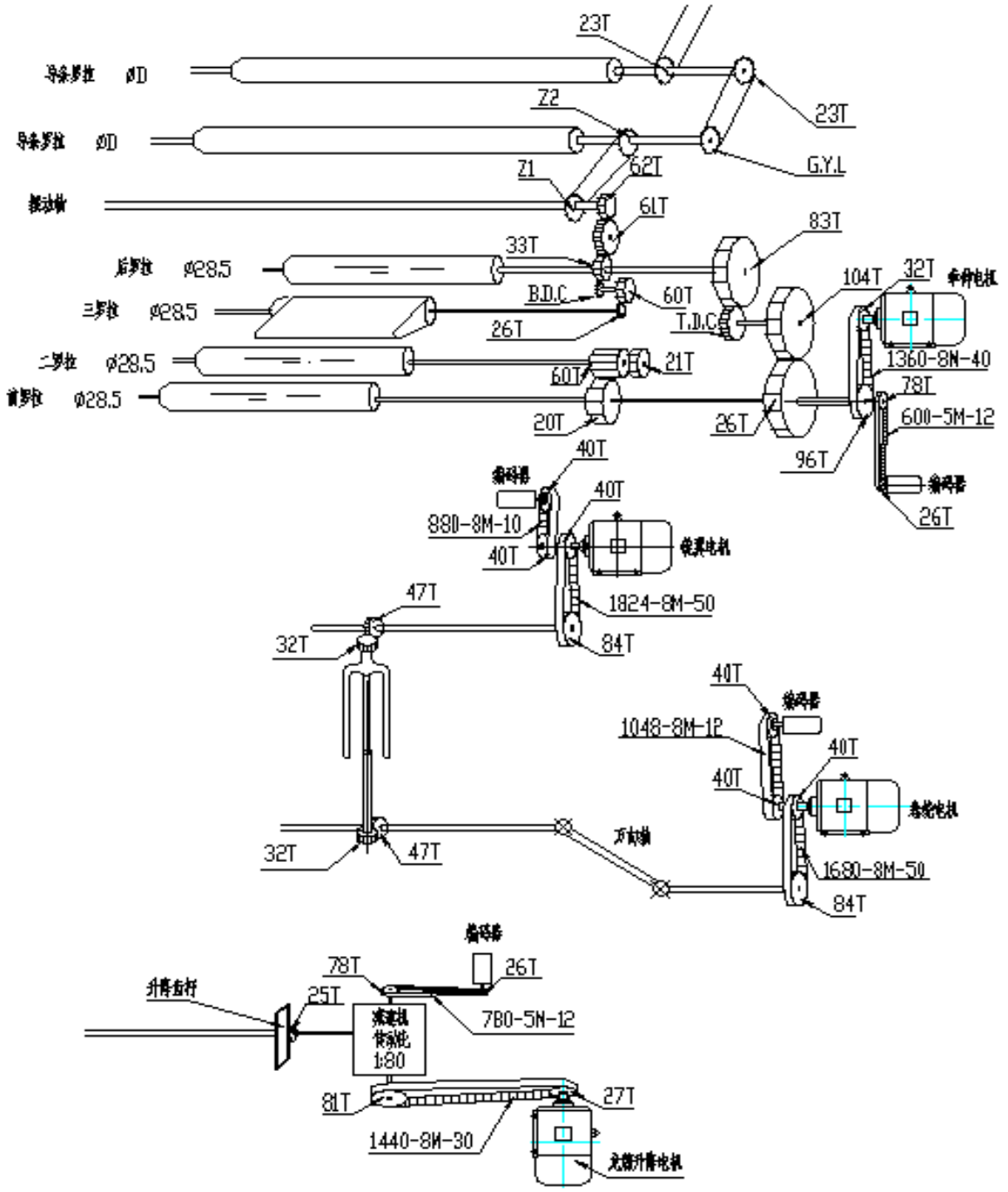


Oil bath drafting system

4. FA497/498 Roving Frame Drive system view



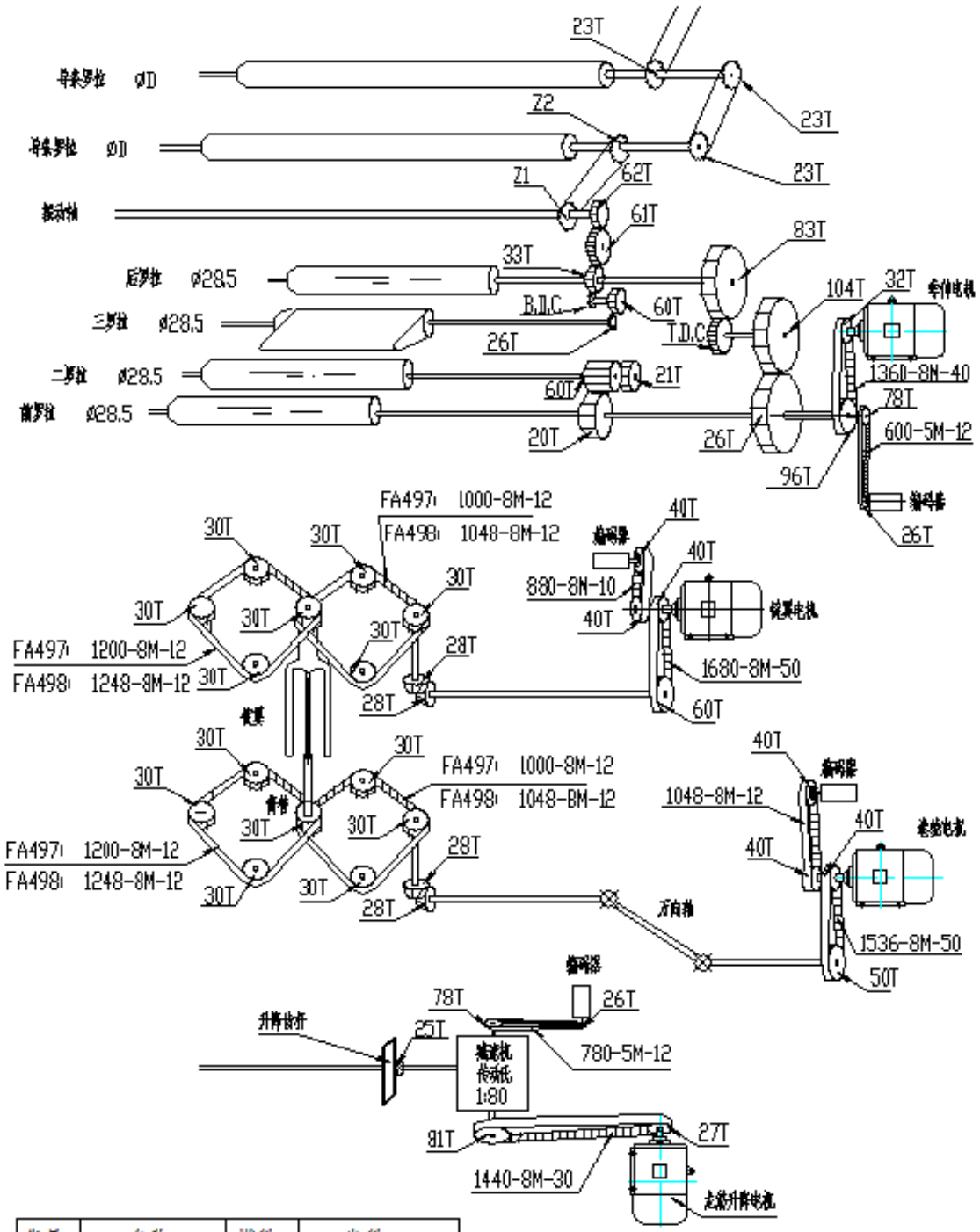
FA497/498 top and bottom Rail gear drive



代号	名称	模数	齿数	
T.D.C	总牵伸变换牙	1.75m	26-71	
B.D.C	总牵伸变换牙	1.75m	45-70	
Z1/Z2	张力调整链轮	9.525	φD-50	22/23 ,23/23
Z1/Z2	张力调整链轮	9.525	φD-64	20/24 ,21/25

FA497/498 Roving Frame Drive system

Rail ---- Synchronous belt drive



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Z1/Z2	张力调整链轮	9.525	ØD=50	22/23 ,23/23
Z1/Z2	张力调整链轮	9.525	ØD=64	20/24 ,21/25

5. FA497/498 electric control system

With Europe's lastest advanced control concepts, Adopts electronic gear, motor torque control theory and asynchronous servo control, to realize the virtual main shaft synchronization, upgraded the traditional Roving Frame control system, successful developed a new digital intelligent roving system to make Roving Frame tension control and adjustment more easier, especially first time applies the motor torque theory on Roving Frame tension fine tuning, can replace the traditional CCD, with accurate torque detection it eliminated the influences on tension caused by workshop temperature and humidity and formed a closed loop for tension controlling. At the same time, also can adopt the RPS roving position sensor of Italy's ROJ (CCD), combined with the motor torque control, control roving tension with dual-loop which make the sliver between the winding speed and the front roller line speed always maintain a certain tension, the winding speed is higher one percent than the line speed. the computer-controlled winding tension is always constant no matter with changes of large yarn, the middle yarn, yarn or workshop temperature and humidity, to the complete synchronization of several motor. Roving elongation has been strictly controlled, fully meet customer requirements for high-quality yarn.

Roving Frame drived by single motor changed to four motors drived, cancle the tradtional driving mechanism, simplify the machine structure with lower faulty rate.

The four motors of FA497/498 Roving Frame seperately drive rollers, flyers, bobbins and rail lifting,the power is 3KW、5.5KW、11KW、1.5KW.

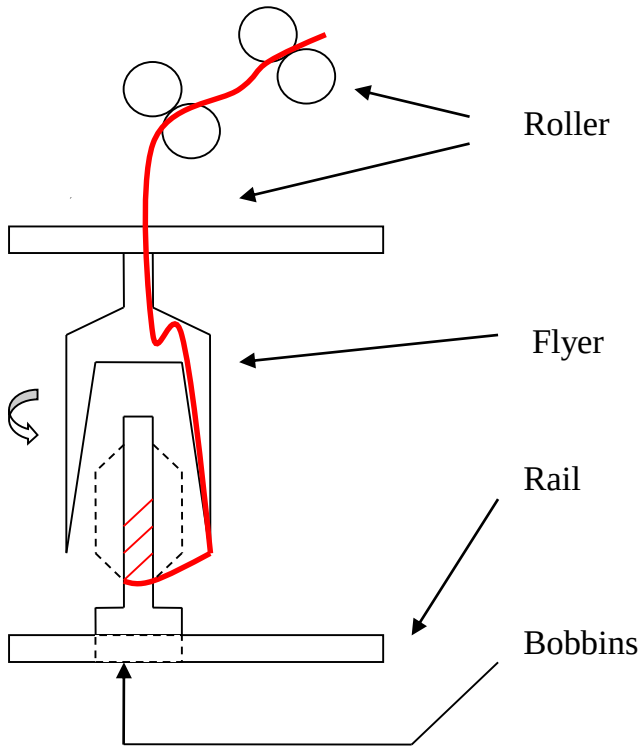
In the spinning process, ensure the theory line speed of the four-part movement consistent, according to the required standard forming.

Electric technical parameters

1、Input voltage：3 phases AC 380V±10%
2、total power：24.75KW
3、 Flyer motor：7.5KW
4、Bobbins motor：11KW
5、Rail lifting motor：0.75KW
6、roller motor：3KW
7、Suction motor：3KW
8、cleaning motor：1.5KW
9、Insulation resistance: 500V DC Gage testing ≥5MΩ(between the terminal and ground terminal)
10、work environment temperature：0~50℃
11、work environment：No corrosive gas，Flammable gas, oil mist and dust etc.
12、Altitude：Below 1000m

6.5.1 Electric structure and erection

6.5.2 Syschronizating drive electric Control description



Description:

. The loading of Roller is always maintain constant, when running only need accessory of closed loop;

. Flyer and bobbin linear velocity to follow roller speed and the direction of rotation, so as to ensure cotton index (tightness, etc.), spindles forming load is bigger and bigger, the speed of the bobbin will be more and more slow,

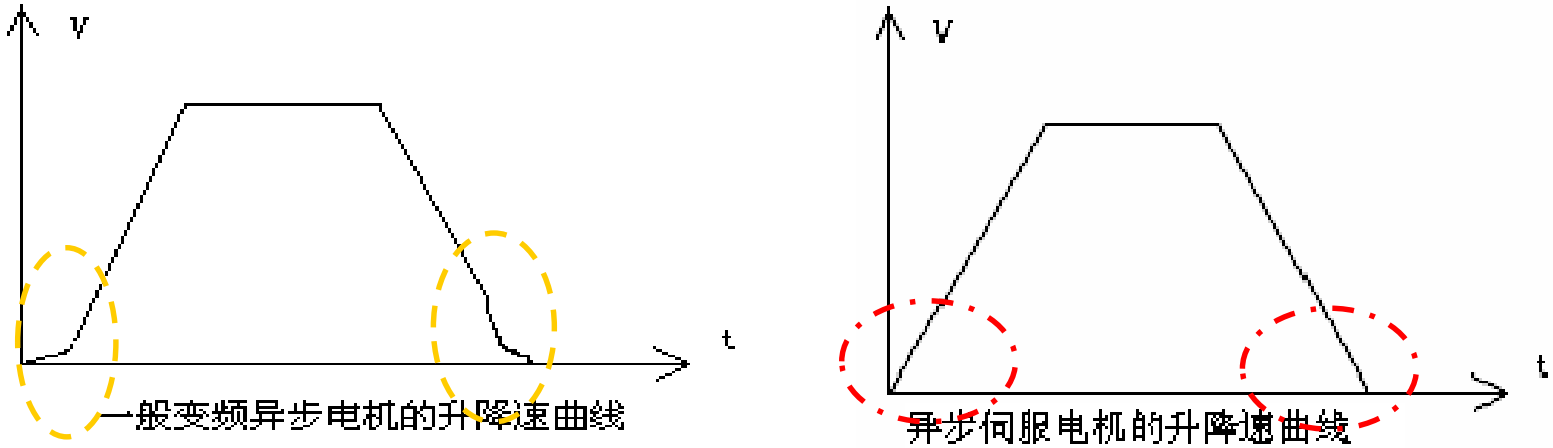
in order to guarantee some molding, linear velocity will change following position with the layer number of change at the same time. o

6.5.3 Advantages of electrical 电气控制系统优点

1、 Using asynchronous servo closed-loop system

Compared with ordinary frequency motor, servo motor has excellent control characteristic, especially in the start stage, common frequency motor at low frequency output characteristic is soft, in the low frequency area, the motor speed is nonlinear, so in this section, the theory speed of the motor and actual speed has the obvious difference, which is not conducive to used for Roving Frame of operation control, directly affect the quality of Roving yarn.

Here are two kinds of control mode of speed curve comparison.

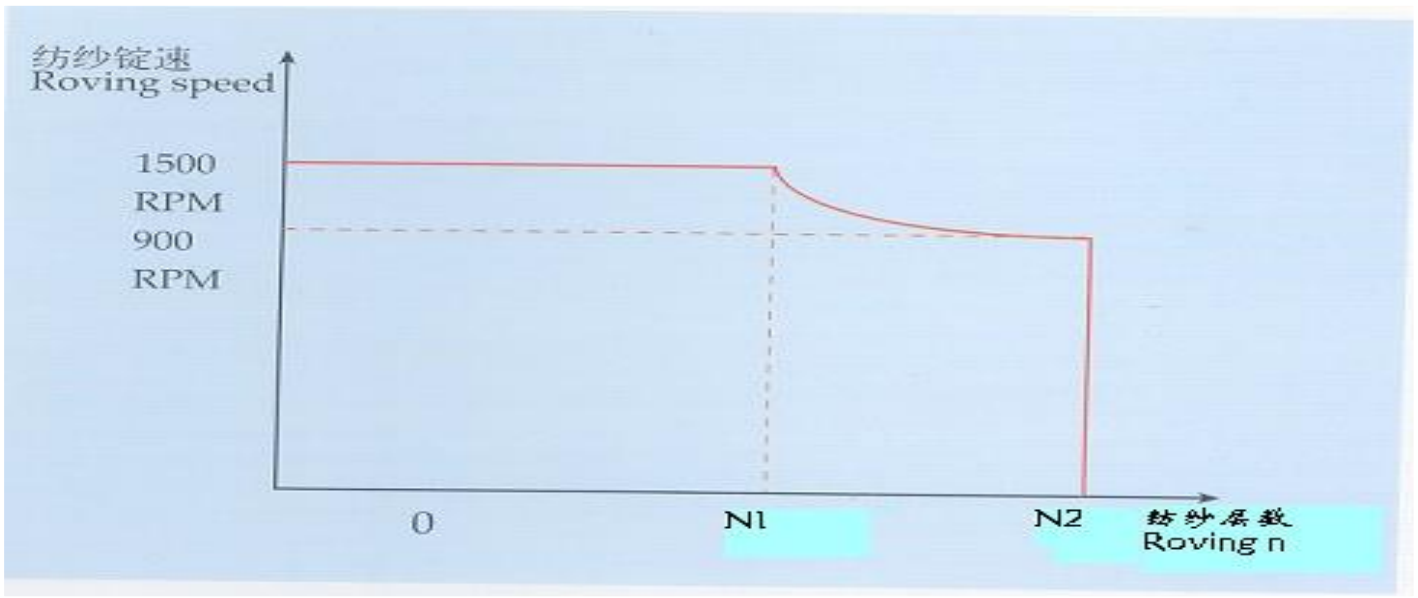


Obviously, Asynchronous servo motor has better starting and braking characteristics, making Asynchronous servo motor can be very good guarantee the consistency of the actual speed and the theory in the whole operation process, namely good controlled features, so as to provide a reliable guarantee for four Asynchronous servo motor in the whole spinning process

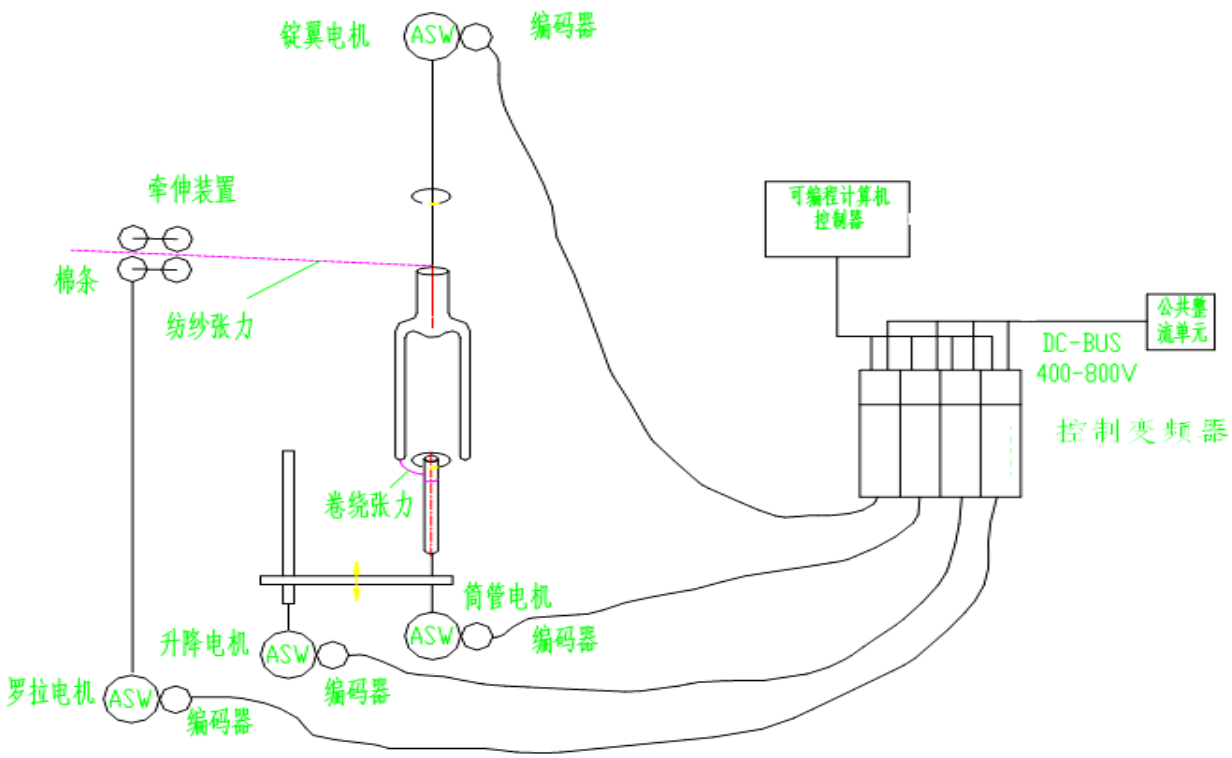
2、 *Use program to control lift frequency conversion motor to realize the freedom of the reversing in the spinning process. Using software to control the reverse of the variable frequency motor, reduced wiring, the reverse time is only 30 ms, which improves the sensitivity and reliability of the reversing, greatly improves the roving forming.*

3、 *According to the requirement of the spinning process, during the middle or big yarn, it can be set automatically to reduce the Flyer velocity, keep roving constant centrifugal force, reduce end breakage, and ensure the quality of spinning.*

According to testing for many times, it came to the conclusion that the spinning speed is low, such as 800 RPM, 1000 RPM, spinning tension had no obvious change, spinning forming is good. In the spinning speed came to 1400 RPM and don't slow down all the way, in the first half spinning , it can maintain stable spinning tension, but in the second half, as a result of the roving winding diameter increases, the tension is not so stable, centrifugal force is too large, affect the roving forming effect, then in the second half, if it can slow down step by step, relatively stable can be identified, forming effect will be better than don't slow down, So in the lower spinning speed , it cannot slow down all the way. But at the second half, the spinning effect will be better if the spinning speed slow down step by step



4、 *Spinning system mathematical model software with independent research and development and adaptive tension theory to reasonable adjust roving tension through encoder feedback. The reasonable mathematical model is suitable for high speed, can effectively control spinning tension, to achieve constant tension spinning. Using the latest control theory, motor torque control theory was adopted to realize the fine-tuning of roving tension, replace the CCD control, overcome the disadvantages of domestic CCD. At the same time, the motor torque control theory can be combined with Italy ROJ CCD to realize double closed loop control of roving tension, tension adjustment become extremely easy.*



6.5.4 Electric Configuration

1、 inverter: Danfoss Brand (Demark)

2、CPU Mitsubishi (Japan)

3、interface 10.4 inch : Korea

4、lower voltage Appliance: Schneider、Siemens、LS

5、photoelectric : Banner

FA497/498 Electric Control System Advantages

1、 Hicorp hardware control system, the components adopt 100% international well-known brand, fully meet the requirements of the EMC standards, ensure the stable system operation with high control precision. The frequency converter imported from Denmark, PlC imported from Japan, touch screen imported from South Korea, tamagawa encoder and low voltage electrical appliances from France schneider. Selection of each component based on strictly quality test and long-term market validation. The top world first-class electrical components from origin to ensure quality and improve stability of spinning.

2、Anti-interference control system design, inverter in-built DC bus reactor and RF filter, the reactor and the filter can be installed on the inverter inlet side, which improved the power factor, and to prevent system interference.

3、The assembly of the electrical equipment is carried out in accordance with European standards, and the installation instructions for the power drive system standard and the test level are manufactured in accordance with EMC standards EMC (89/336 / EMC). Control lines and power lines were separated from each other in order to prevent signal interference.

4、Inverter can adopt large heat sink structure with automatic variable speed cooling fan, which can measure the inverter internal temperature and automaticly open and close cooling fan to make inverter in stable.

5、Patented multi-motor synchronous control system achieved a digital roving program control; The spinning process parameters and spinning tension parameter settings can be modified at any time online through man-machine dialogue interface.

6、With the expert database system and process of digital storage function, mature varieties of spinning process parameters can be preserved through the module for 100 different process and can be recalled directly when changing varieties, which improved efficiency obviously.

7、Fixed lengthing、positioning and directional parking can be achieved on roving machine which ensure that the error less than 1 meter in each doffing, so as to achieve a collective yarn transfer work in ring spinning to reduce waste and improve production efficiency.

8、Optional for CCD tension detection device.

9、Power off protection function to ensure normal parking when power off so as to avoid mess yarn head breakage.

10、The worker has plenty of work to do during work. Intelligent parking function ensured that flyers stopped in the same position which not only simplied worker's operation but also improved the efficiency.

11、It is sure to achieve any kind of yarn head breakage when spinning full. The control system automaticly engaged into full roving procedures to pull off the yarn at a certain length of the presser with stable table tension, which improved yarn head breakage efficiency and deduced work.

12、The photoelectric sensitive adjusting function can inspect different varieties of yarn previously.

13、Anti-thin knot function. The anti-thin knot coefficient can be multi-level adjustable to make the yarn in loose state during starting and paking, which reduced the contact resistance between the roving and false twister, so as to eliminate the thin knot.

14、The initial winding mode selection function. The initial winding mode can be selected according to the different types of bobbin from upper or lower, so as to improve the utilization of roving by solving the initial winding sticking or flying.

15、The function of anti-winding for bobbin when initial winding, according to the situation of the roving, set the spindle anti-winding bobbin speed and the number of layer, which effectively prevent damage for spinning quality and for flyer.

16、The power rate measurement device, can not only complete power measurement, energy metering, data display、acquisition and transmission, but also can record and store voltage, current, power rate, power factor, etc.

17、Internet link function:

Through networking to realize unity managerment and control for the workshop so as to improve efficiency. The system can and follow up all running information (Power-off / power-on, start-up / stop, operation data, fault, diagnosis, maintenance, etc) and record into fiel as real database for enterprise data anylise), which changed traditional rules for workshop management by hand-copied production and make plan with experience. This strengthen equipment management andrealized allocation of resources and increased the economic efficiency to enhance the enterprise's management philosophy and ability.

7.1 Mechanical features:

1、Each rail including 12 spindles, the connection between machine beam, Rail and wallboard are used to dislocation connection, which are a triangular structure, strong frame for high speed and long spindles machine Short span, frame rigidity, suitable for high speed and long car models.
2、Drafting roller is equipment with 28.5 mm diameters, especially avoid to s torsional vibration wave problem for main drafting roller;
3、Four independent transmission independently, synchronous belt transmission is used in the main drive system to simplify mechanical in structure and easy to maintenance.
4、Cleaner provide independent power to reduce the friction load for long machine

7.2、cost advantage for long roving frame

1、Less quantity, reduce total cost and less covers an area

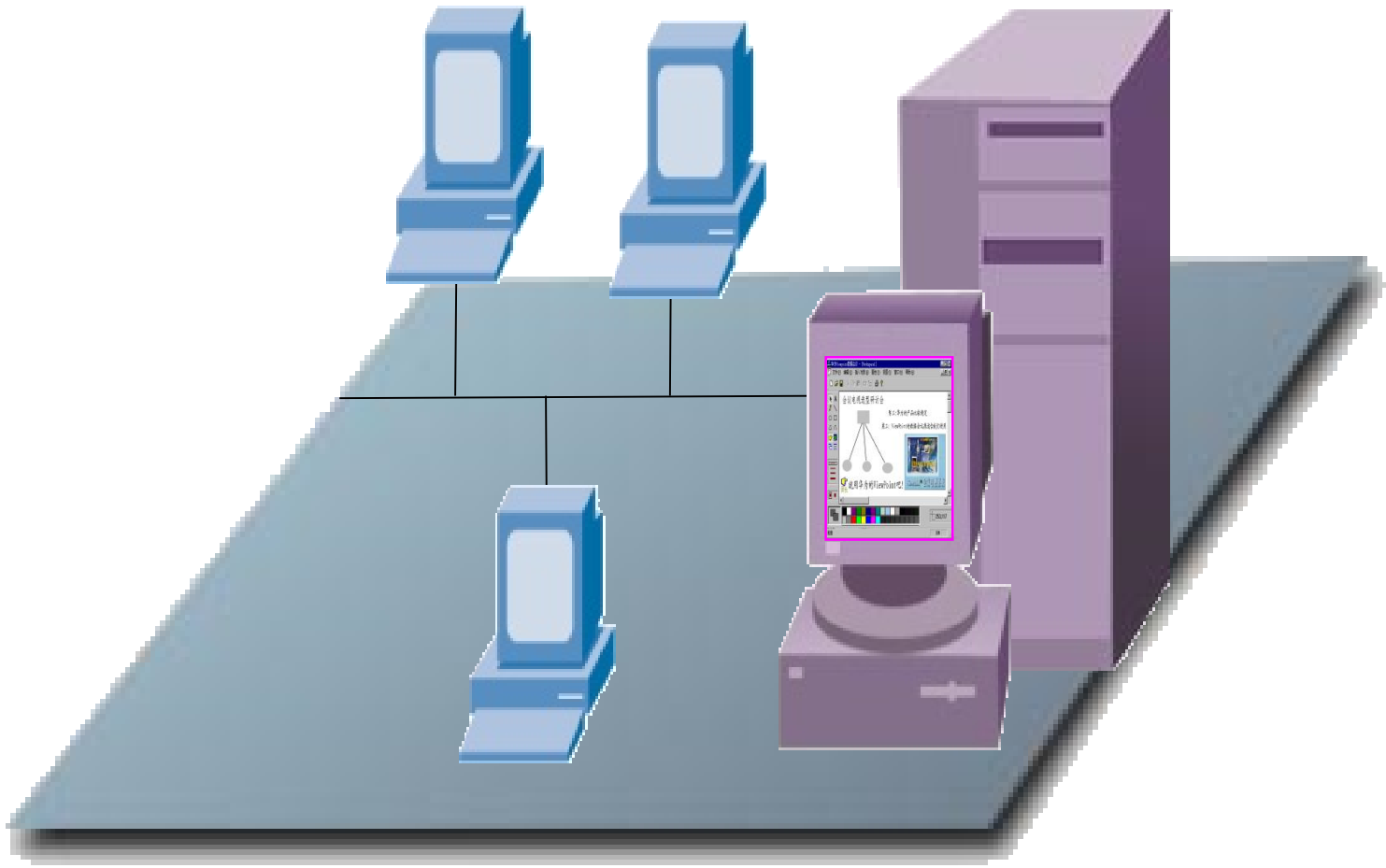
2 、 The worker labor cost lower compared with 120 spindles, lower labor cost.

Spindles fro Roving Frame	120	132	144	156	168	180	192
Worker（each 2 set for 3 shifts ）	33	30	27	24			
Save compared with 120 spindles		3	6	9			
Save worker cost (5000RMB/month)		180000	360000	540000			

7.3electric cost

Set for 100 thousands spindles Roving Frame	120	132	144	156
Sets	22	20	18	17
Power（each hour）	7.75	8.00	8.35	8.65
Running/year（days）	315	315	315	315
Running/day （hour）	22	22	22	22
Consumption/hour	170.50	160	150.30	146.38
Consumption/year（10 thousands）	118.16	110.88	104.16	101.44
Save（10 thousands） （comparing with 120 spindles）		7.28	14.00	16.71
Save amount （RMB ）		58200	112000	133700

Roving Frame upgrading



➢Why need upgrading?

1、 Roving Frame with Cone drum has complicated mechanism structure, adjusting difficult, need high level professional repair and maintenance person.

2、Tension Control is not stample. Tension control is not stable, influence the yarn quality. Complex Tension adjustment, also can be influenced by Cone drums manufacturing precision and adjust the initial position

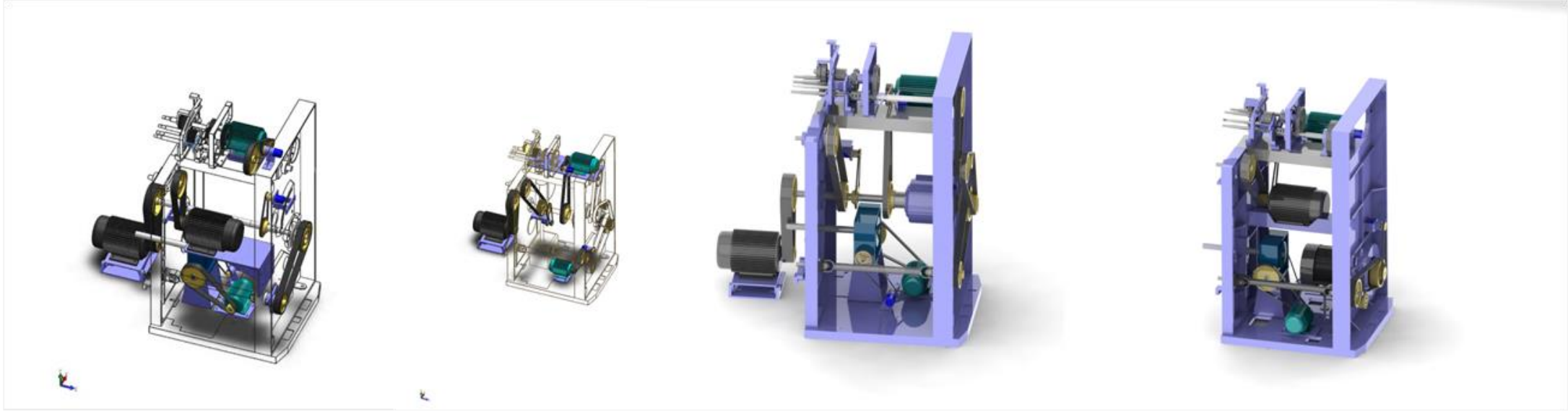
3、 Process adjustment need replacing technical gear, process adjustment time is too long, and also can be restricted.

4、 After years of use, maintenance cost and accessories cost rise.

5、 It need more labor force, how to solve the current difficult recruitment, labor shortage contradiction

6、 Warranty is complex, high requirement to the service personnel, and security maintenance personnel technical level is shortcoming, big fluidity, directly affect the normal use of equipment.

Simple and convenience, improve quality, saving energy , reducing consumption



➢ Roving Frame upgrading scheme

✓Replace the whole headstock and electrical control
✓ upgrade older headstock , replace the whole electrical system

- **TJFA458 upgrading**

  TJFA458 upgrade e to FA494、FA498

- **TJFA1415 upgrading**

  TJFA1415 upgrade e to FA494、FA498

- **FA422 upgrading**

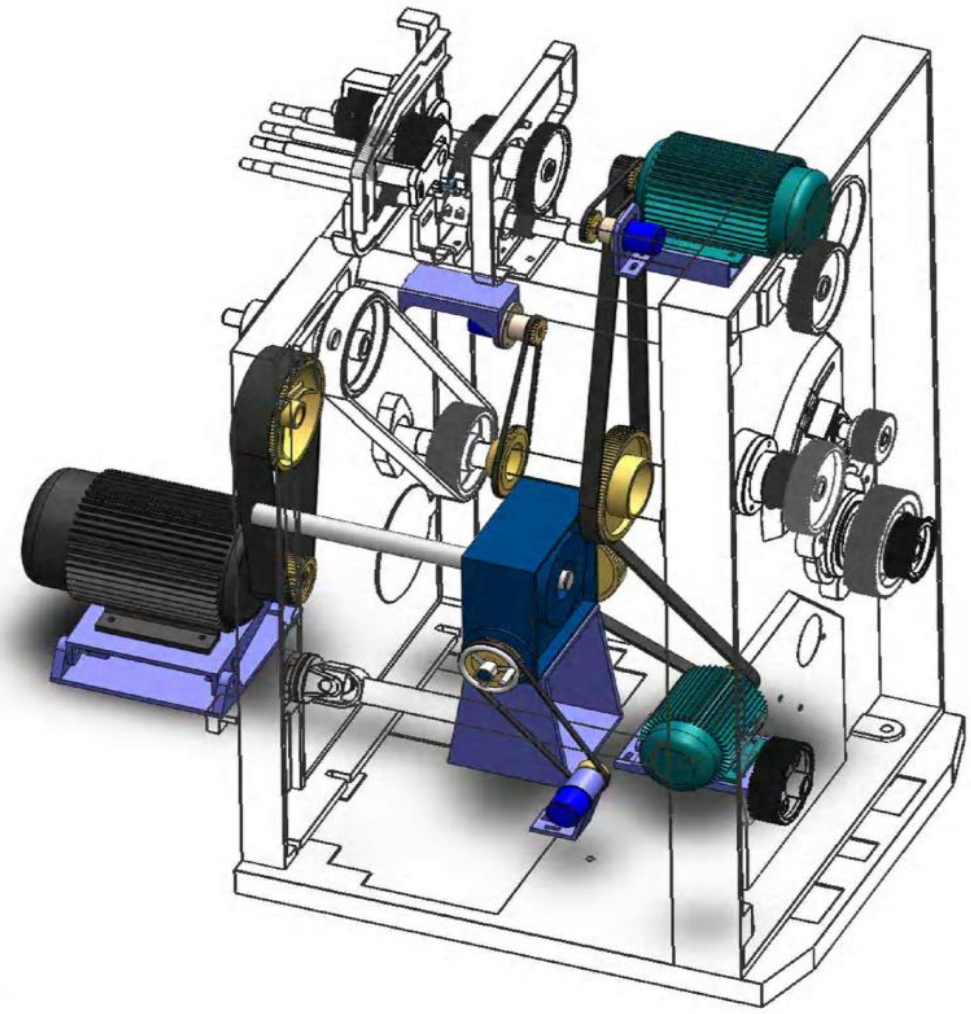
  FA422 upgrade to FA494、FA498， replace headstock、 not replace headstock

- **FA496 upgrading**

  FA496upgrade to FA494、FA498，replace headstock、not replace headstock

- FA421 upgrading
  FA421upgrade to FA494、FA498，replace headstock、not replace headstock

Roving Frame modify scheme



The headstock diagram for FA421 modify to FA494

➢ Roving Frame modify scheme

➢FA423 modify

FA421 modify to FA494、FA498，replace the headstock or not

➢FL16 modify

FFL16 modify to FA494、FA498，replace the headstock or not

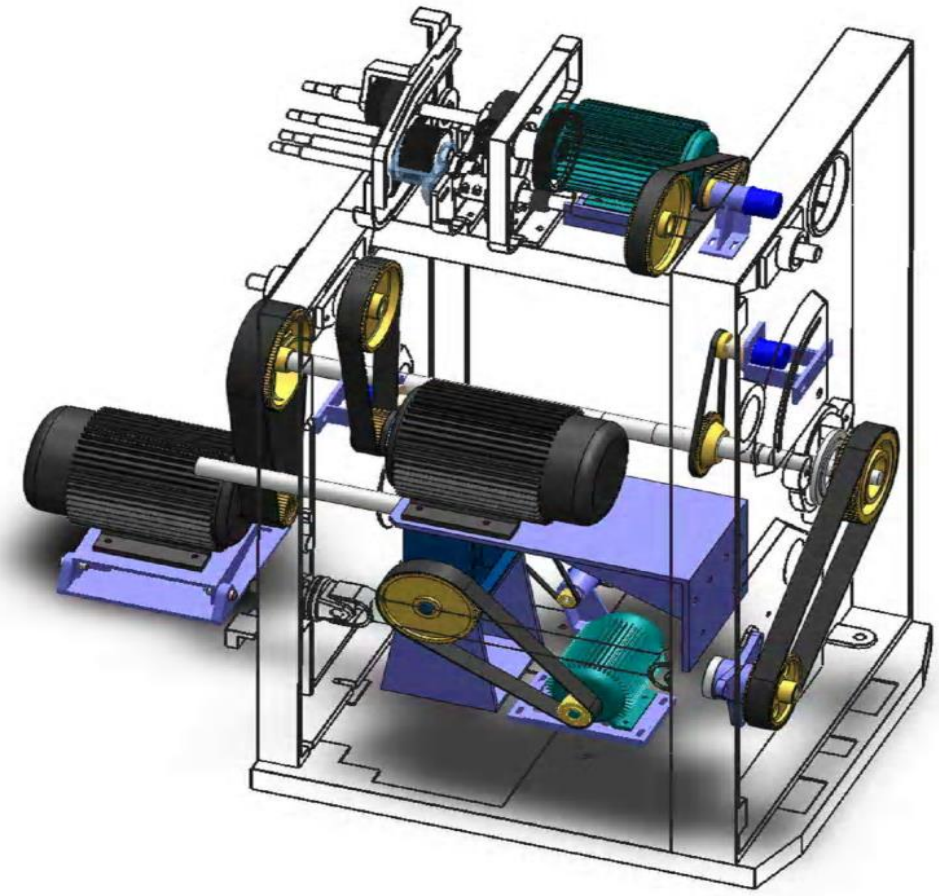
➢FL100modify

FL100 modify to FA494、FA498， replace the headstock or not

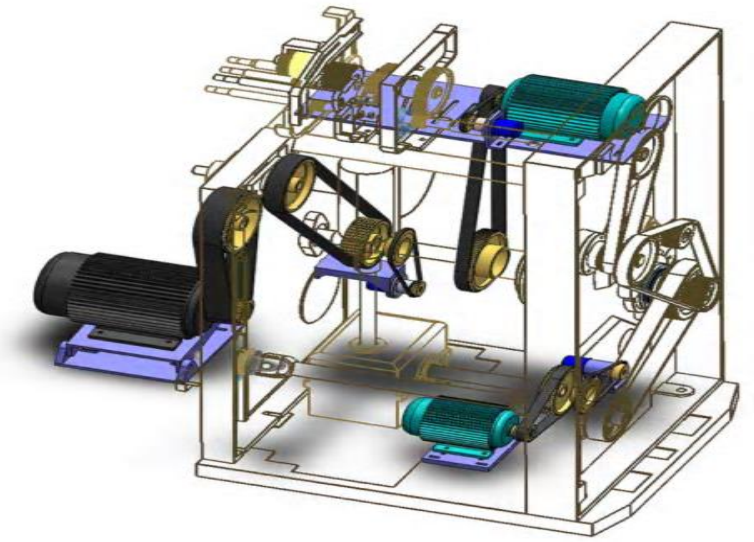
➢FA471、FA472 modify

FA471、FA472 modify to FA494、FA498， replace the headstock or not

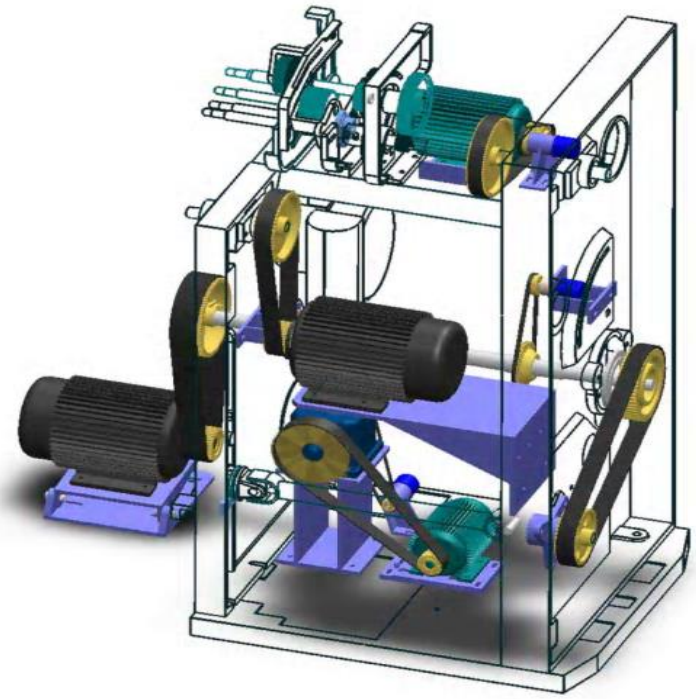
➢ Roving Frame modify scheme



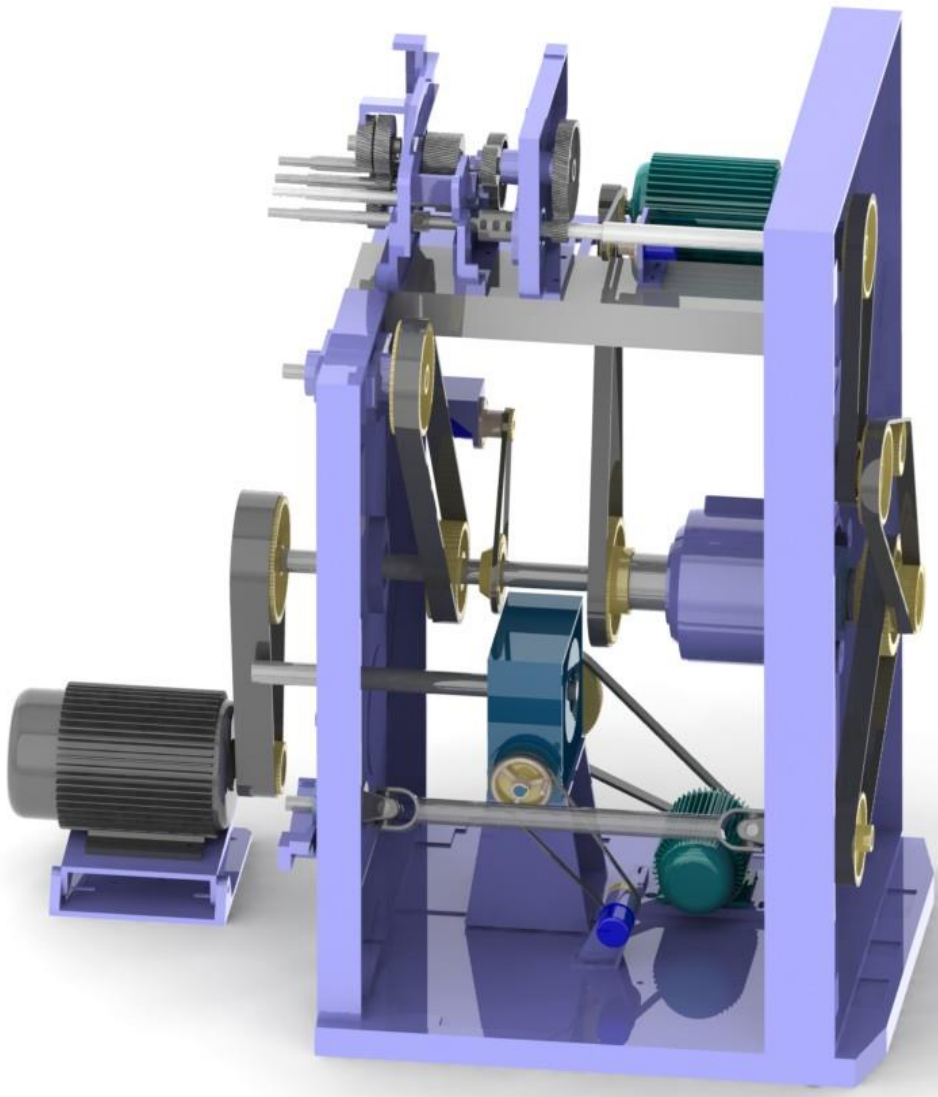
The headstock diagram for FA421 modify to FA498



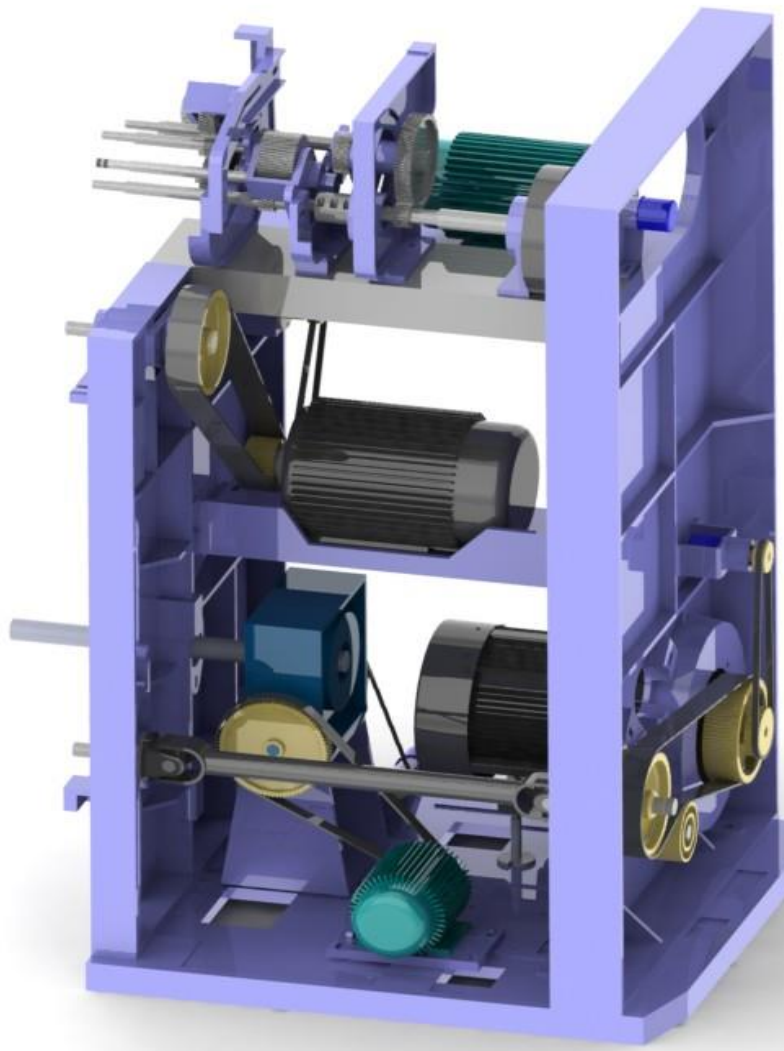
The headstock diagram for FA458 modify to FA494



The headstock diagram for FA458 modify to FA498



The headstock diagram with Replacing the whole headstock to FA494



The headstock diagram with Replacing the whole headstock to FA498

➢ Roving Frame改造的优点

Any Roving Frame could modify to FA494 or FA498， the Advantages：

Electronic forming, convenient adjustment, eliminate yarn-flying, bad-forming and instability tension phenomenon.

Abnormal simplified mechanical structure, mechanical maintenance and maintenance workload is reduced by more than 80%, avoiding to dependence on the mechanist.

- *The machine could connect to the Internet, realizing information; changing the traditional production management mode.*
- *Technical process easy setting, maximize to realize gear simplification*
- *the error between the length of each doffing and The machine < 1 m*
- *increase computerized machine convenient function, to realize fixed length, orientation, parking, doffing according to different varieties, the realization of all varieties of yarn breakage function automatically*

Increase speed and improve efficiency, reduce the cost of repair and maintenance.

Thank you!