

NJP-1200 Automatic Capsule Filling Machine USER MANUAL



Wenzhou Finetech Machinery Technology Co.,Ltd., PART

Tel: +86 15382537883,

<https://pharmamachinecn.com/njp-1200-automatic-capsule-filling-machine/>

1. General Description

NJP-1200C series of fully automatic hard capsule filling machine are a new generation machine, featuring human-machine interface, PLC, sound sealing, variable-frequency stepless speed adjustment, easy operation, high ratio of capsule mount, precise dosage, low energy consumption, high yield, product standardization and serialization. The main technical parameters lead the trade in China. With different specifications of mould, No. 00 to No. 5 hard capsules and safety capsules A, B, C, D, E can be filled. Both slow-released pellets fill and mixed fill with powder and pellets can be realized.

2. Technical Performance

2.1 Dimensions: 1020 × 860 × (1970+210) mm (refer to Fig. 1)

2.2 Weight: 900 kg

2.3 Power Supply: 380V, 50 Hz, three phases/four wires

2.4 Total Power Require: 5.75KW

2.5 Water supply: adopting liquid ring vacuum pump and recycled water tank,

Exterior water supply may also be used. Vacuum: -0.02~-0.06 MPa

Flow rate: 250 L/h

Water pressure: 0.0012~0.0015 MPa

Inner diameter of incoming pipe: 15 mm

Inner diameter of drainpipe: 20 mm

2.6 Environment requirement: temperature: 21°C ± 3 °C

Relative humidity: 40~55%

2.7 Air supply requirement: industrial suction machine with 160 m³/h exhaust capacity is needed to collect defect capsule and residual medicine powder.

In order to make your work environment better, we recommend that your suction machine and recycled water tank should be installed in a work-isolated room.

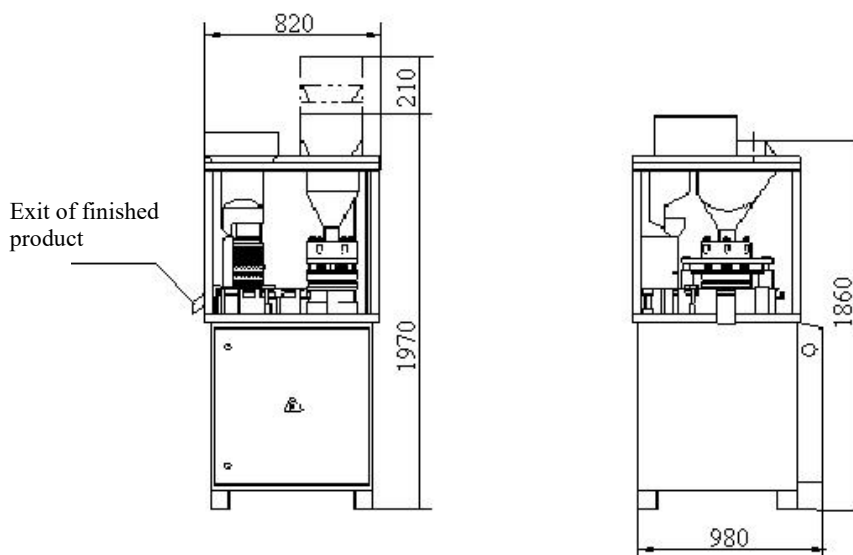


Fig.1 Appearance and Dimensions

3. Installation and Power Connection

The machine shall be installed on level ground of adequate bearing capacity. Should the machine be installed upstairs, the bearing ability of the floor shall not be lower than 1000 kg/m². Rubber cushion shall be installed to resist shock. The bench of the machine shall be adjusted to horizontal level with level instrument.

Further check: manually rotate the machine for some rotations and lubricate every part in accordance with relevant stipulation.

To prevent contamination, carefully clean all parts that directly contact the medicine with alcohol.

Do not turn on the power switch unless you make sure the voltage and frequency are suitable for this machine. Since frequency converter controls motor of machine, the Revolving Platform is always rotating clockwise. Check whether the rotational direction of dust collector is identical to the mark, if the direction is wrong, exchange the two wires of power supply. The vacuum pump, dust collector and mix motor are identical in the inner line.

4. Working Principle (refer to Fig. 2, 3, 4, 5)

NJP-1200C fully automatic hard capsule filling machine varies its output by varying die assembly (quantity of die hole). It has 9 holes turning out a highest output of 1200 capsules/minute.

During the operation, the capsules in the charging hopper at the first station are fed through two hoppers vertically to capsule-feeding plate one by one. Then capsules are fed to the outside end of straightener by a horizontal fork and fed to the die assembly by vertical fork and pull of vacuum. Then split caps and bodies. At Station 2, the die assembly is lowered and moved outwards. At Station 3, pellet unit is installed for filling slow-released pellets. At Station 4, powder is filled (medicine powder is filled and pressed for five times and then fed into the body). Station 5 is left for station expansion. At Station 6, suction system cleans defect capsules (cap and body not split). At Station 7, the lower die assembly moves inwards and upwards simultaneously. At Station 8, locking pushrod moves upwards to join the filled capsules. At Station 9, the joined capsules are ejected and collected. At Station 10, the die holes are cleaned with dust collector to prepare for entering next cycle.

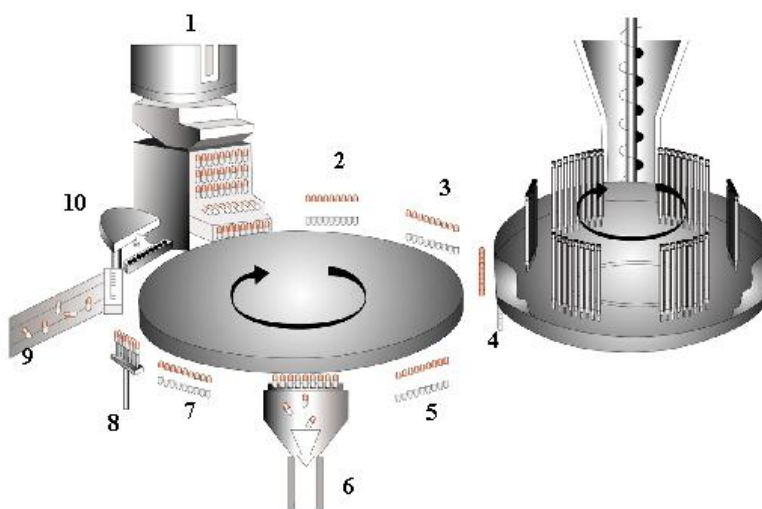


Fig. 2 Operation Route of Capsules

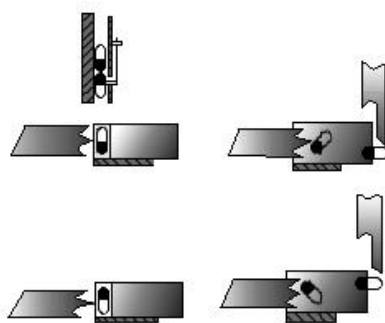


Fig. 3 Capsule Turning-around Course

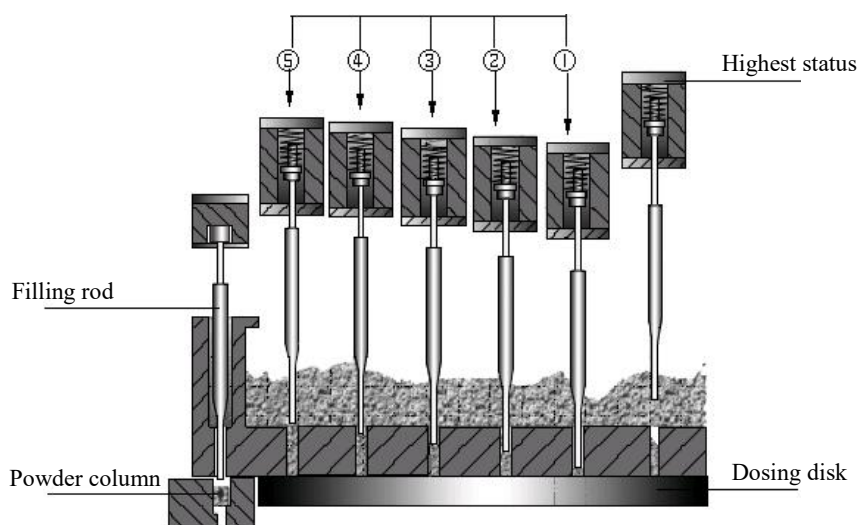


Fig. 4 Powder Column Preparing and Filling Course

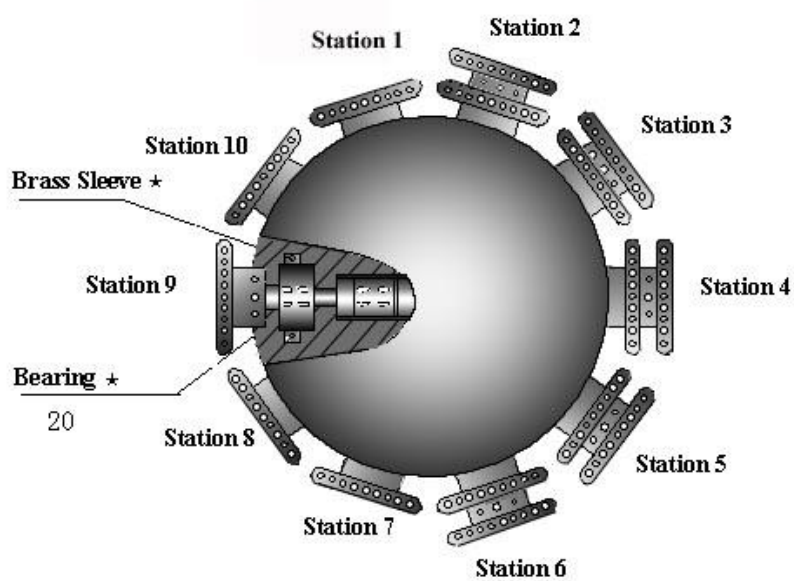


Fig. 5 Revolving Platform (*indicating lubricating point)

Station 1: cap and body splitting

Station 4: powder column filling

Station 5: pellet and tablet filling

Station 6: defect capsule cleaning

Station 8: joining

Station 9: lead-out of joined capsules

Station 10: die hole cleaning

5. Operation Instruction

5.1 Replace filling tools

To change the size of capsule, replace corresponding upper and lower die assemblies, capsule feeding plate, horizontal fork, vertical fork, straightener, filling rod and dosing disk.

5.1.1 Replace filling die assembly (refer to Fig. 6)

Loosen the fastening screws of upper cover plate of revolving platform and remove the upper cover plate, loosen and remove fastening screws on the upper and lower die assemblies and take out the two die assemblies. Then install the lower die assembly of another specification; align two positioning holes with two column pins of T-type axle and tighten screws. Then install the upper die assembly; insert the regulating rod of each pair of upper and lower die assemblies in the two holes at the outside respectively at Station 8 to regulate their concentricity; then tighten the screws. Make sure the regulating rod rotates freely in the holes of upper and lower die assemblies.

Caution: Move the arbor wheel of the main motor with hand shrank in replacing the die assembly and rotate the revolving platform. Remove the regulating rod before rotating!

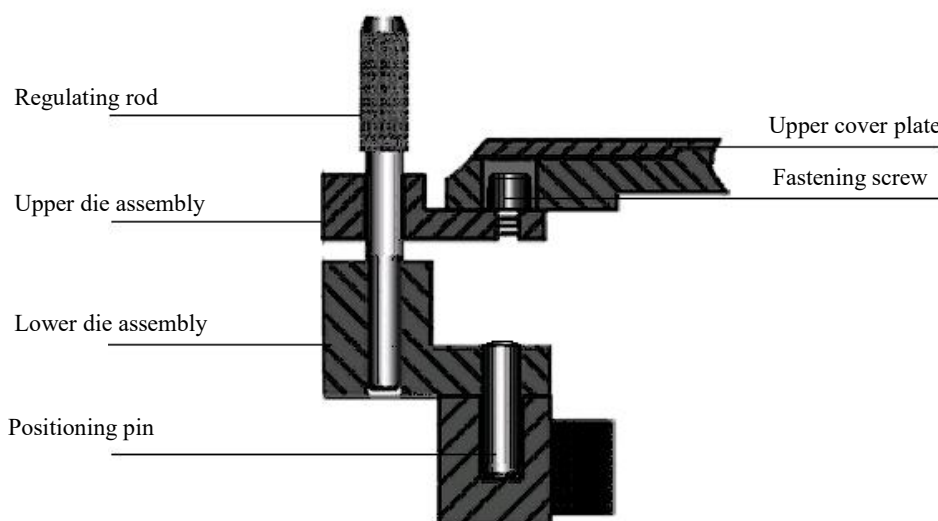


Fig.6 Centering the Die assembly

5.1.2 Replace capsule-feeding unit (refer to Fig. 7, 8)

5.1.2.1 Disassembly

- 5.1.2.1.1 Loosen two fastening screws on capsule hopper, remove the screws and the hopper;
- 5.1.2.1.2 Move arbor wheel of main motor with hand crank and let capsule-feeding plate go to the highest position;
- 5.1.2.1.3 Loosen four fastening screws on capsule-feeding plate, remove the capsule-feeding plate;
- 5.1.2.1.4 Loosen two fastening screws on straightener, remove the straightener;
- 5.1.2.1.5 Loosen fastening screws on horizontal fork, remove the horizontal fork;

5.1.2.2 Replacement and Installation

- 5.1.2.2.1 Align two positioning holes of straightener with the pins of casing, and tighten the screw;
- 5.1.2.2.2 Align two grooves of horizontal fork with the pin of lateral sliding plate and install on the sliding plate; adjust to feeding capsule to the optimum position and tighten screw (generally feed the body of capsule to the outer end surface of straightener);
- 5.1.2.2.3 Align two positioning holes of capsule-feeding plate and rear plate with the pin of straight sliding plate, and tighten screw;
- 5.1.2.2.4 Install capsule hopper and tighten screw (make sure the clearance around square groove and capsule-feeding plate should be uniform);
- 5.1.2.2.5 After replacing capsule feeding parts, put some empty capsules in the hopper and start vacuum pump, open capsule release unit, rotate the machine with hand crank to ensure normal capsule splitting.

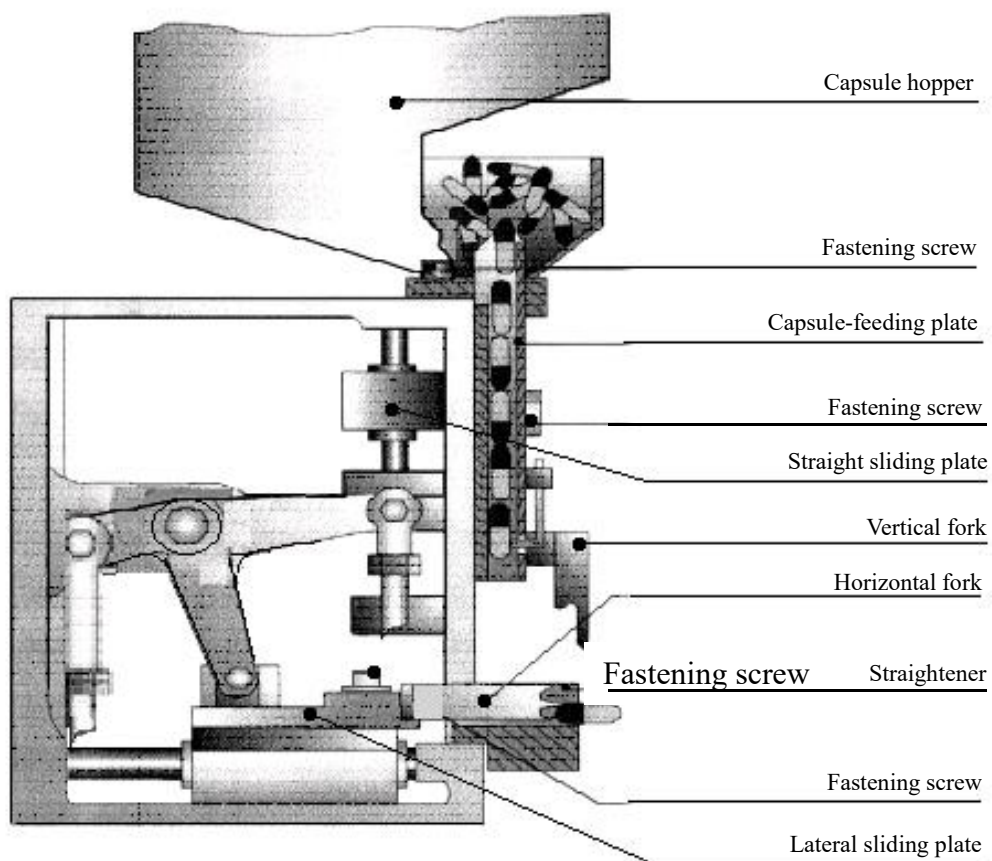


Fig. 7 Capsule-feeding Mechanism



Fig.8 Straightener

5.1.3 Replace dosing disk and filling rod (refer to Fig. 9, 10, 11)

- 5.1.3.1 Loosen fastening screws and raise powder hopper by the resilience of spring; (refer to Fig. 9)
- 5.1.3.2 Absorb residual power in power-store ring with dust collector;
- 5.1.3.3 Rotate the arbor wheel of main motor with hand crank until the holder of filling assembly reaches the highest position;
- 5.1.3.4 Loosen and remove acorn nut, rotate knob clockwise (refer to Fig. 21) to uplift and remove press plate and filling retainer;
- 5.1.3.5 Loosen the screws on the small press plate with square hole under the retainer and remove the filling rod. After replacing the filling rod, replace the small press plate and fasten the screw;
- 5.1.3.6 Draw out baffle upwards, loosen two screws on both sides of powder-storing ring cover and remove baffle outside powder-storing ring, loosen four fastening screws of power-storing ring and remove the ring and cover plate from dosing disk gently from the side without removing filling rod holder;
- 5.1.3.7 Loosen three fastening screws of dosing disk with special wrench, remove dosing disk and powder-storing ring.
- 5.1.3.8 Clean the powder in the tray and replace alternate dosing disk of another specification. Do not tighten three fastening screws for the time being;
- 5.1.3.9 Insert two dosing disk regulating rods separately into multiple holes of filling rod holder at different positions. Gently rotate dosing disk so as to insert the regulating rod easily, carefully tighten three screws in turn. Should the regulating rod be unable to insert in dosing disk hole easily, you must re-adjust until the rod can be inserted easily;
- 5.1.3.10 Insert powder-storing ring and cover plate to the precise position from the side, rotate the machine with hand crank and fasten four screws of powder-storing ring. If newly-replaced dosing disk is thicker than the former one, lift the powder wiper correspondingly.
- 5.1.3.11 Fasten screws of cover plate. Carefully examine the clearance (0.05~0.1mm) between powder wiper and dosing disk with feeler gauge, then tighten fastening screws;
- 5.1.3.12 Install filling rod and retainer in their original positions and tighten acorn nut.

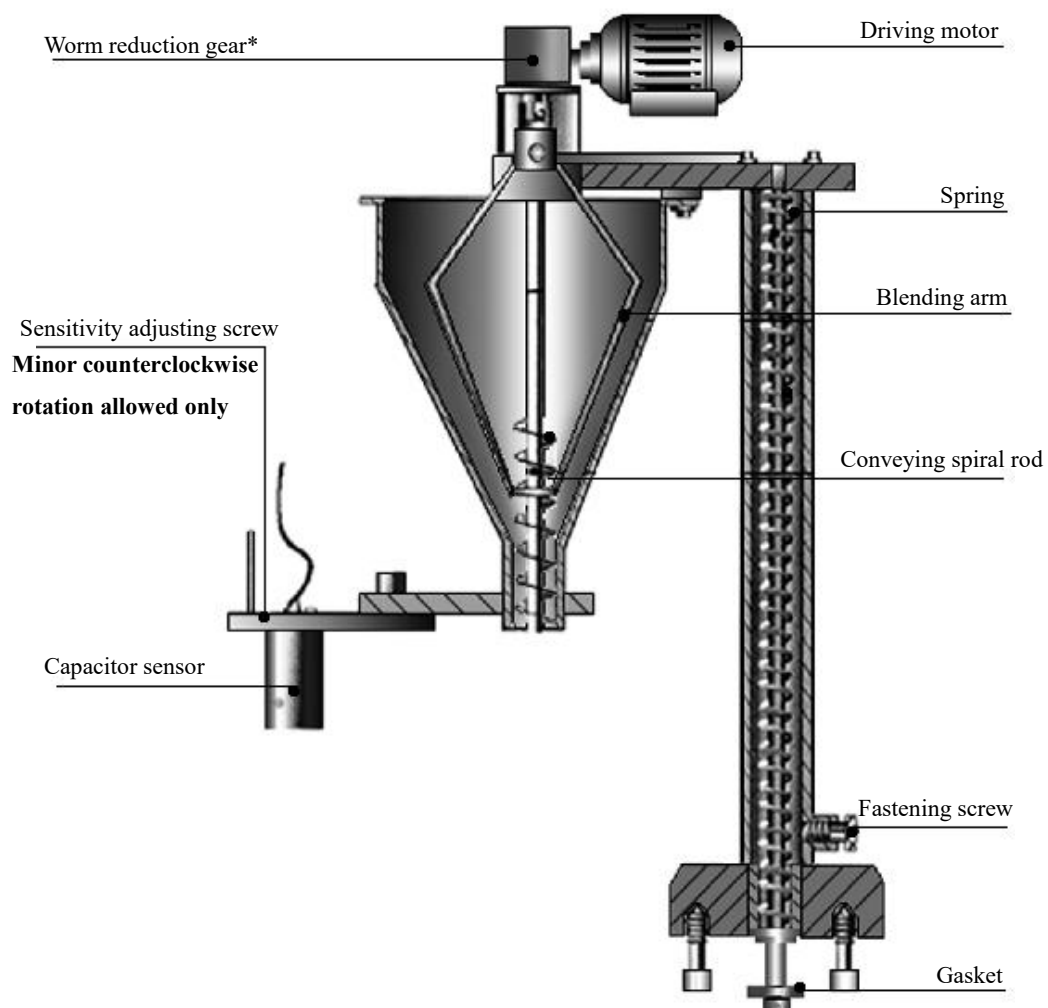


Fig. 9 Feeding Mechanism

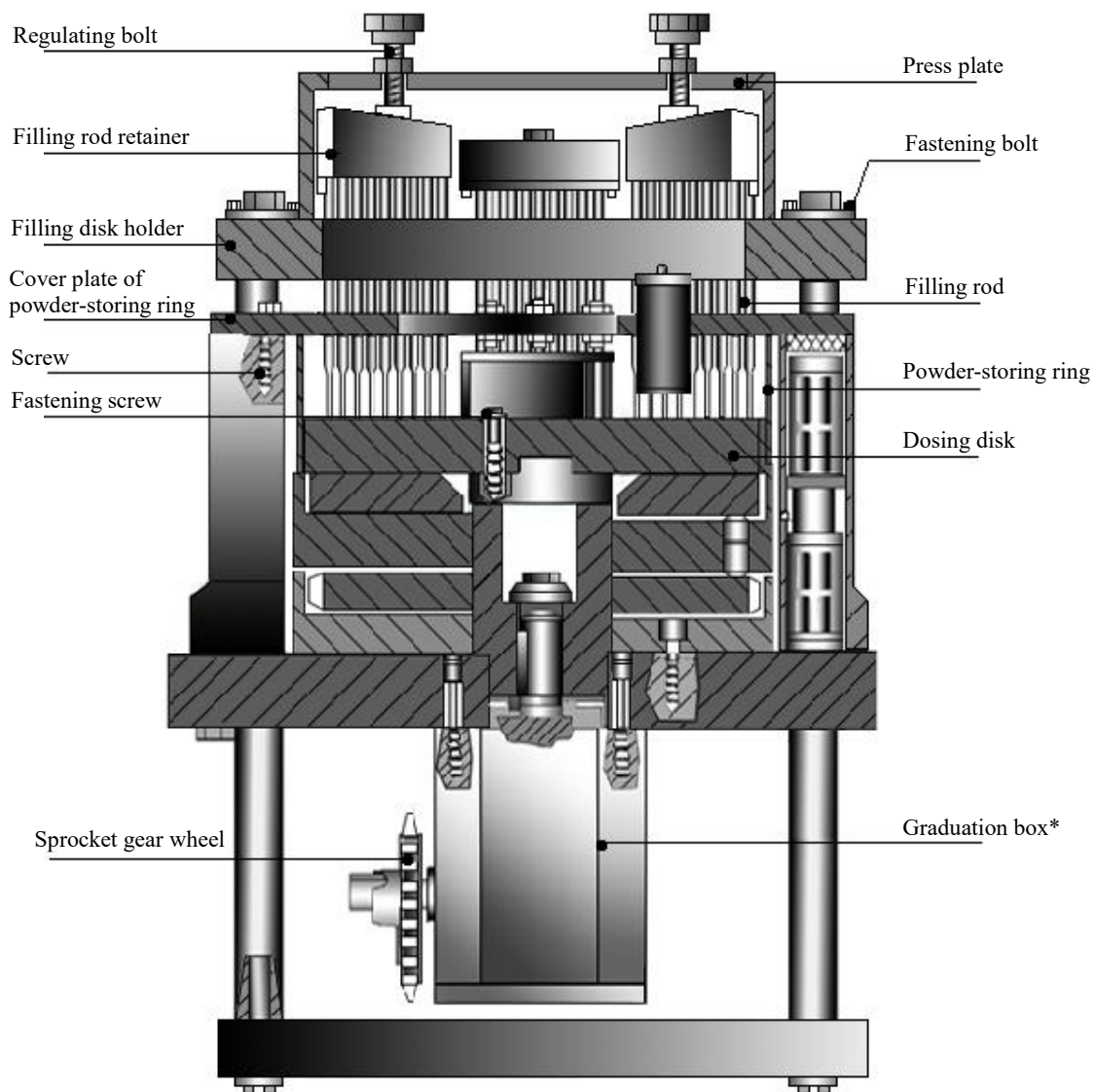


Fig. 10 Dosing Unit

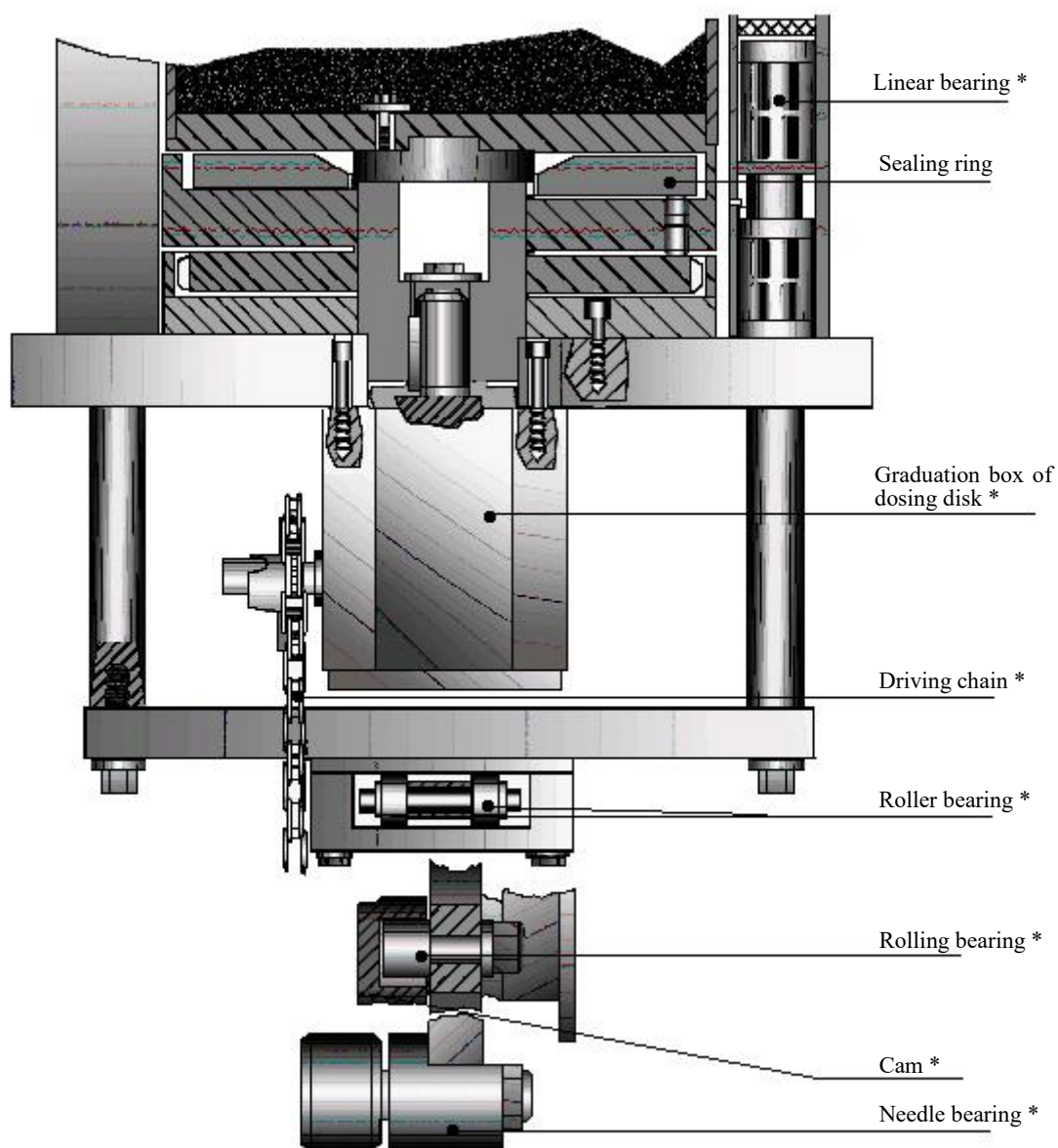


Fig. 11 Driving Mechanism of Dosing Unit

5.1.4 Adjustment after replacing die assembly

Whenever having replaced die assembly, make proper adjustment of the machine. First rotate arbor wheel of motor for 1~2 rotations with hand shrank. If anything abnormal happens, stop the rotation immediately and eliminate the trouble.

5.2 Adjustment of the Filling Machine

5.2.1 Adjustment of the exit of capsule hopper (refer to Fig. 12)

The capsule baffle installed on the hopper can control the height of capsule at the exit by loosening the fastening knob and pulling the baffle. According to the experience, the height of exit should be preferably the half of capsule height at exit.

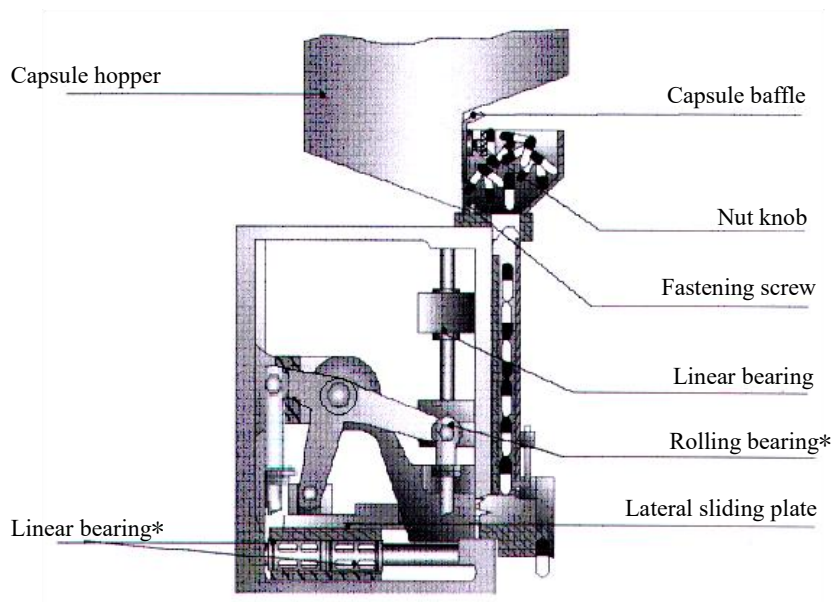


Fig. 12 Feeding Unit

5.2.2 Adjustment of Capsule-Detaining Reed (refer to Fig. 13, 14)

The time of opening and closing capsule-detaining reed ensures that only single capsule should be discharged out of capsule-feeding plate each time. To adjust the time, loosen the fastening bolt of limit block and move the limit block to allow only single capsule to be discharged each time. Then detain the capsule to be discharged at the position as illustrated below:

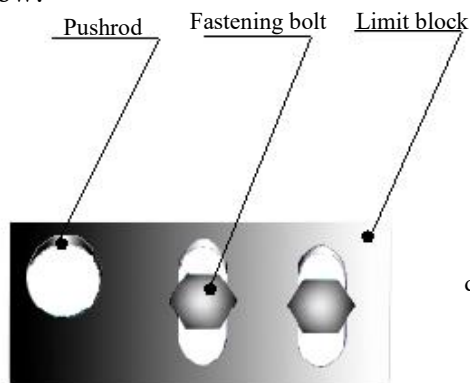


Fig. 13 Limit Block

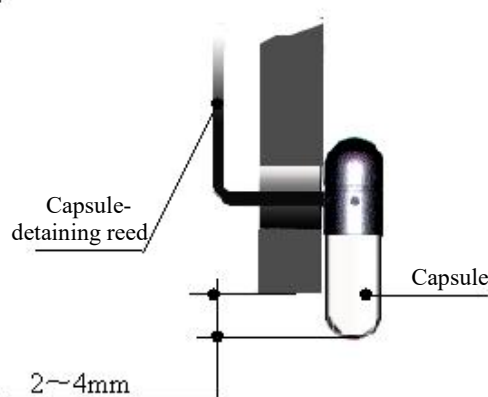


Fig. 14 Capsule-Detaining Reed

5.2.3 Adjustment of Vacuum Separator (refer to Fig. 15)

Whenever the machine runs by a station, vacuum separator goes upwards and downwards once. The position of vacuum separator is well regulated at factory's delivery; no adjustment is needed in most common case. Should any adjustment is needed, rotate arbor wheel of main motor with hand crank until the vacuum separator reaches the highest position, loosen fastening nuts (left and right thread) on both sides of regulating rod under machine bench, rotate regulating rod to adjust vacuum separator height (clearance between upper surface of separator and the lower surface of lower die assembly), and then fasten the nuts. Recheck for several times until proper status is met. Place empty capsules in the capsule-feeding unit and start vacuum pump, rotate machine with hand crank to verify normal capsule splitting.

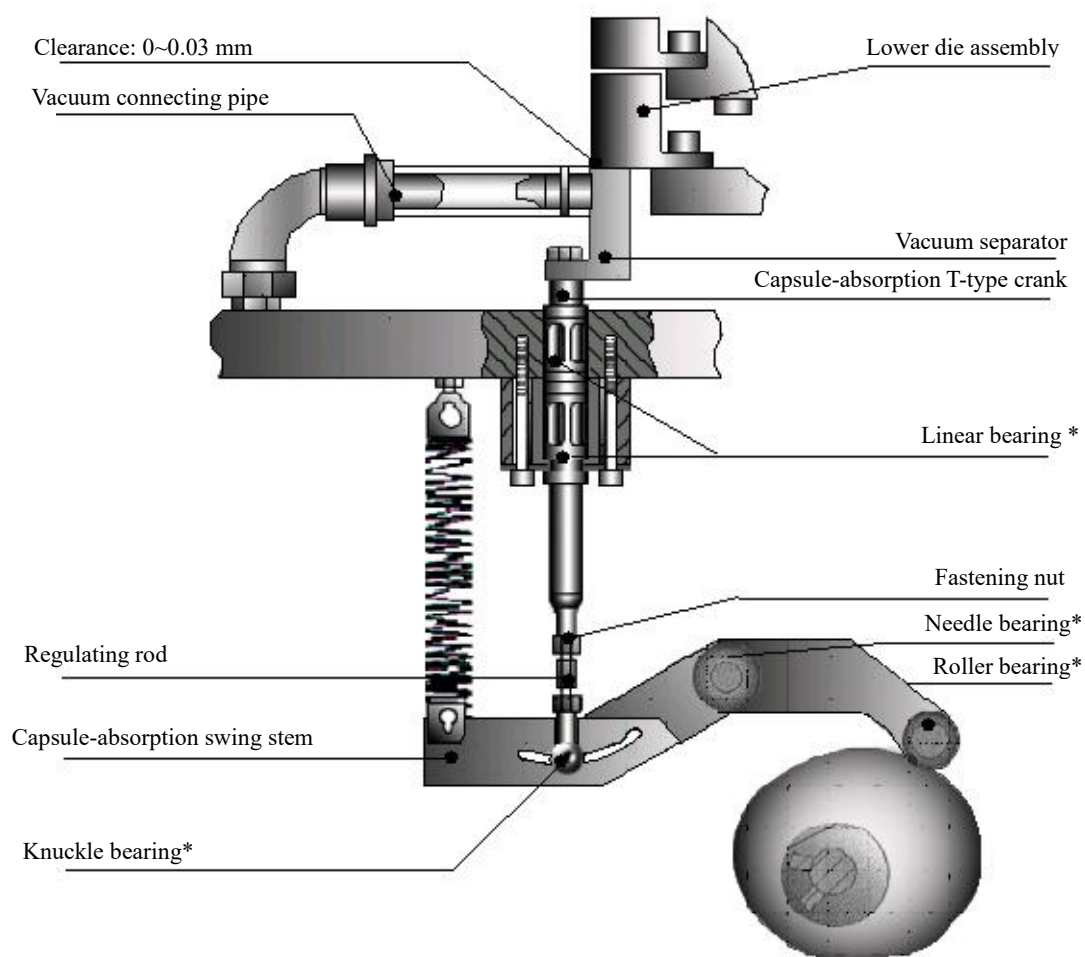


Fig. 15 Adjustment of height of vacuum separator

5.2.4 Alignment of upper and lower die assembly

After replacing die assembly or finding the frequent occurrence of unsplit or joined caps and bodies, make sure the alignment of die assembly is adjusted as illustrated in 5.1.1.

5.2.5 Adjustment of the clearance between dosing disk and sealing ring (refer to Fig. 16, 17)

The clearance between dosing disk and sealing ring should be preferably 0.03~0.08 mm. With larger particles, the clearance may be adjusted wider. Too narrow clearance may increase the resistance between dosing disk and sealing ring. Should too much powder leakage or resistance occur in the operation, adjustment of the clearance shall be made. To adjust the clearance, draw out baffle and loosen fastening screw on adjusting base, first rotate adjusting knob counterclockwise to lower sealing ring, then rotate adjusting knob clockwise to raise sealing ring. After deciding the clearance between sealing ring and dosing disk with feeler gauge, lock the fastening screw. If sealing ring is adjusted too high, just rotate the adjusting knob counterclockwise to lower sealing ring and then rotate clockwise to raise it. Adjust from high to low shall not be allowed. The knob has a scale. Whenever you rotate one degree, sealing ring will rise by 0.015mm. After adjusting the clearance between dosing disk and sealing ring, install baffle on the tray.

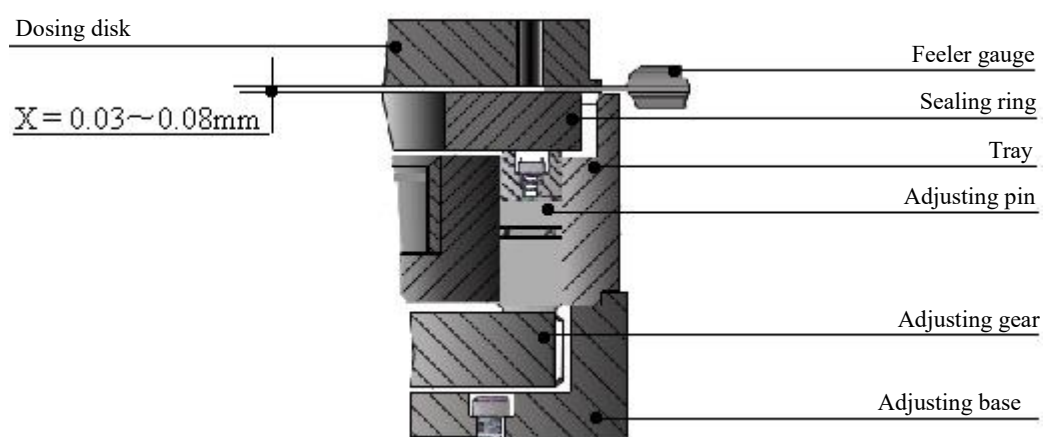


Fig. 16 Structure of Dosing Disk and Sealing Ring

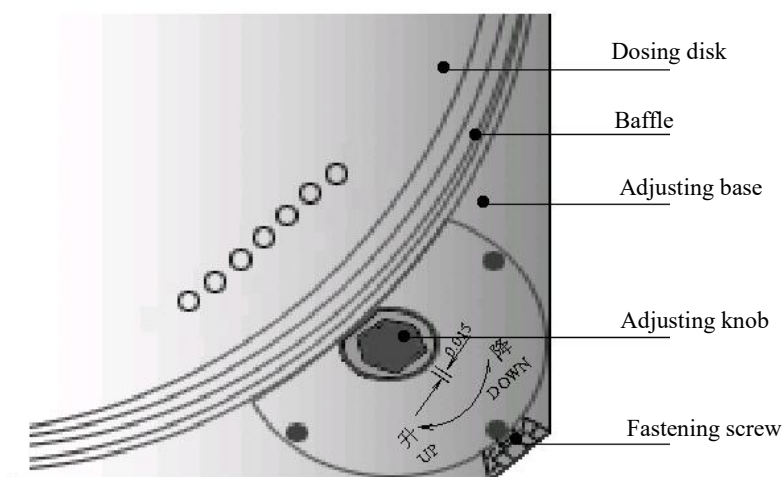


Fig. 17 Adjusting Unit of Dosing Disk

5.2.6 Adjustment of powder wiper clearance (refer to Fig. 18)

Adjust the clearance after replacing dosing disk each time. The clearance should be preferably 0.05~0.1 mm. To adjust the clearance, loosen the fastening nut and rotate adjusting screw to raise or lower the powder wiper. Measure the clearance with feeler gauge and tighten the fastening nut.

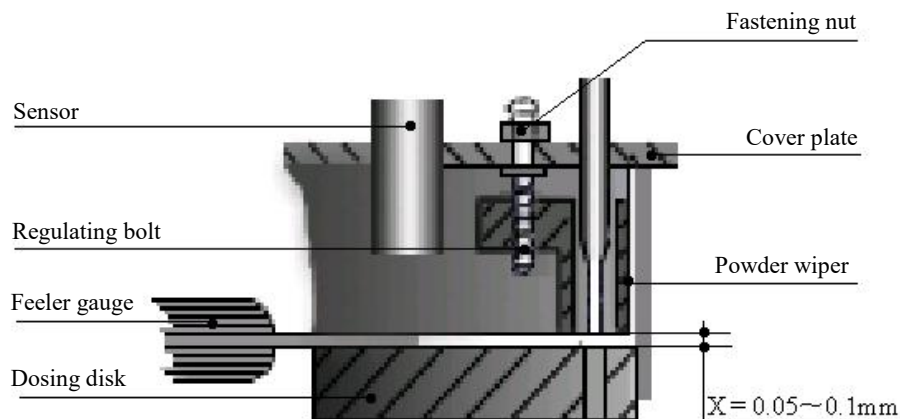


Fig. 18 Clearance between Powder Wiper and Dosing Disk

5.2.7 Adjustment of the height of filling rod retainer (refer to Fig. 19, 20, 21)

The density and volume of powder column change with the height of the filling rod. Appropriate adjustment of filling rod height leads to precise volume of powder filling. The depth that filling rod enters dosing disk may be decided upon the reference table and not be too deep. When filling rod disk holder is at the lowest position, the “0” scale line of retainer represents that the lower surface of filling rod is at the same level as the lower surface of dosing disk, i.e., the numerical reading aligned with the work position line of sight glass is the very height of the lower end surface of filling rod from sealing ring. To adjust the height, loosen the fastening screw on adjusting rod, rotate the knob on the screw stem counterclockwise so as to raise the filling rod, and then rotate the knob clockwise to lower it to desired height, finally tighten the fastening nut. That is to say, adjustment shall be made in the order from high to low. (When the thickness of dosing disk is 18mm)

Station	1	2	3	4	5
Depth into dosing disk	9	5	3	2	0.5

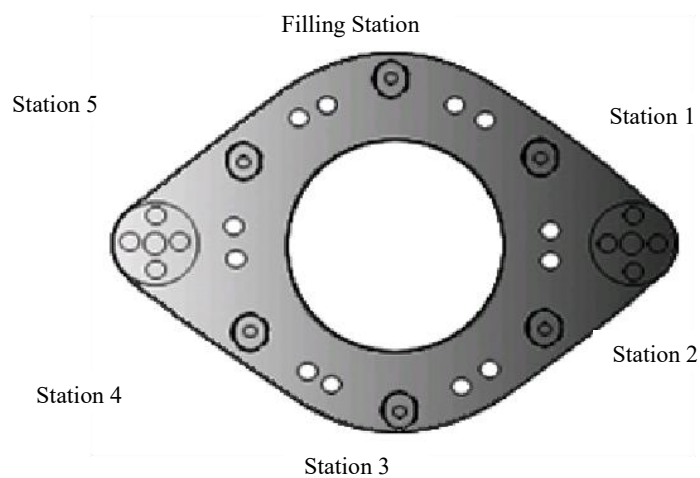


Fig. 19 Layout of Six Stations in Filling Unit

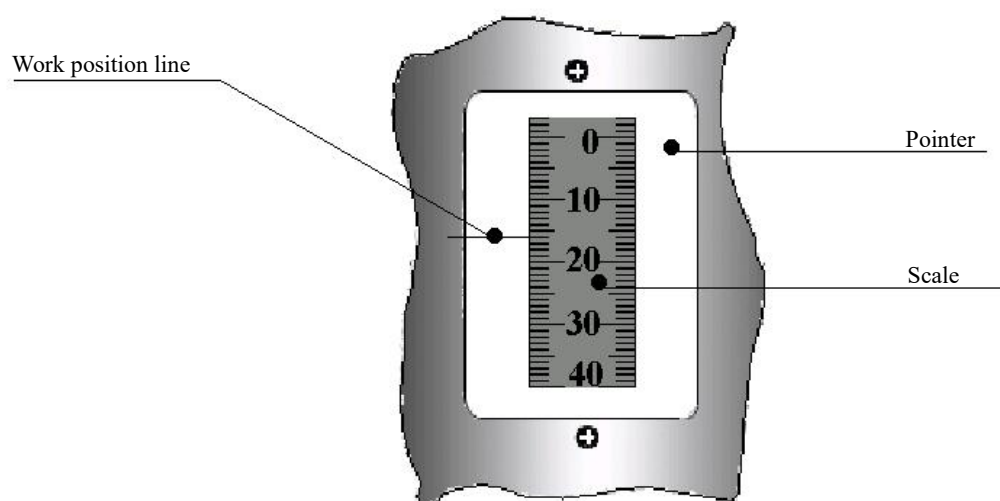


Fig. 20 Scale

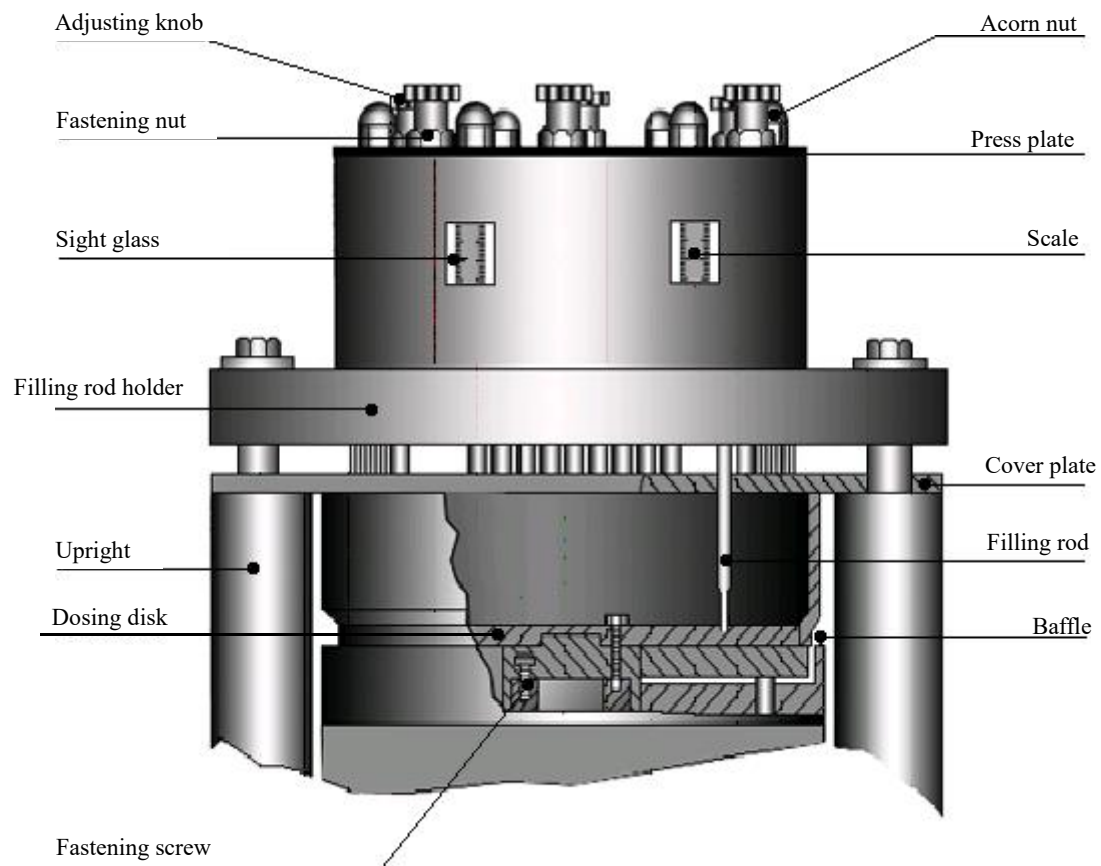


Fig. 21 Adjustment of Filling Rod Height

5.2.8 Adjustment of powder height sensor (refer to Fig. 22)

Capacitor sensor is applied to control the height of powder in the powder-storing ring. The signal emitted by sensor controls the start and stop of feeding motor. Therefore, the height of sensor decides the height of powder in powder tank. Appropriately adjust the height of sensor according to powder specification and its flowability to obtain precise filling volume. To adjust the height of sensor, loosen the screw on the sensor and raise or lower the sensor. After adjustment, fasten the screw. The screw in the upper part of sensor may control sensitivity. The distance between sensor and powder is 2~8mm.

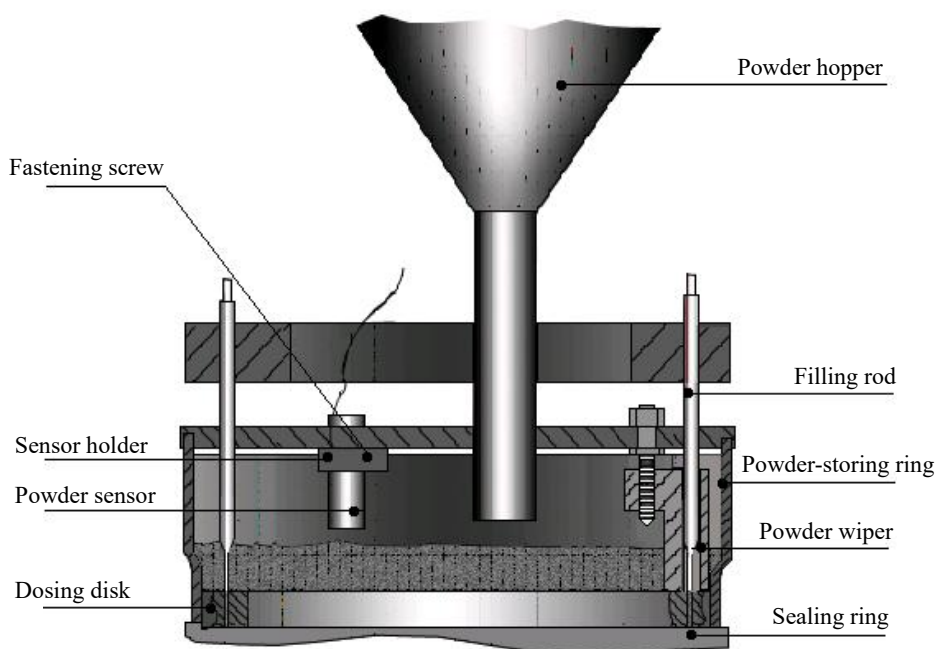


Fig. 22 Adjustment of Powder Height Sensor

5.2.9 Adjustment of defect capsule rejection (refer to Fig. 23, 24)

At station 6, the pushrod reciprocating vertically can reject unseparated capsules in the upper die assembly. By adjusting the bolt on the cam connecting rod, the pushrod reciprocating vertically can avoid bump with the upper and lower die assembly and simultaneously reject the Defect Capsules. The column pin after the adjustment should be in the center of die assembly hole. The clearance between the guider on the Defect Capsule box and the die assembly can be adjusted by adjusting the fastening screw to such a position that the die assembly will not bump into the capsule while the capsules may be smoothly led out.

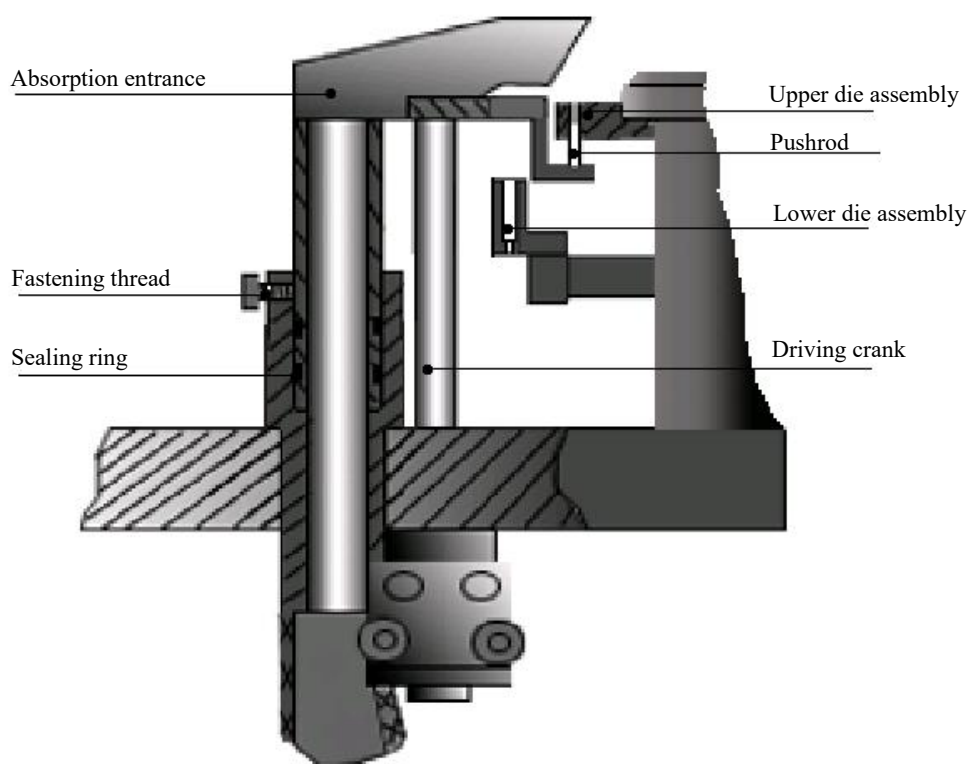


Fig. 23 Mechanism of Defect Capsule Rejection

To adjust regulating rod height, loosen fastening screws on knuckle bearings on both ends of regulating rod, rotate regulating rod to adjust pushrod height. Put unsplit capsule in the hole of upper die assembly at Station 6, move main motor shaft with hand crank to raise and lower the regulating rod, see to it that defect capsules are successfully absorbed, finally tighten nut. The adjustment of pushrod must be careful to avoid collision between upper and lower die assemblies when pushrod runs vertically.

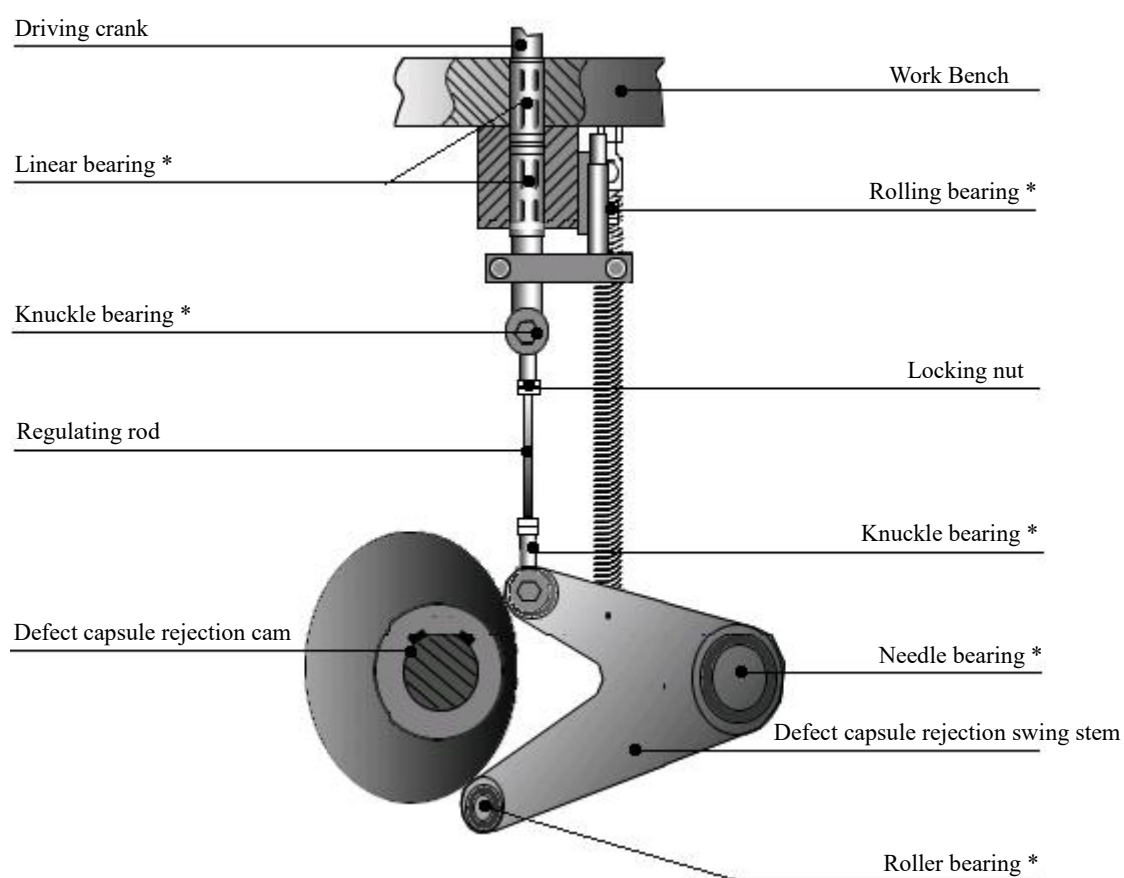


Fig. 24 Driving mechanism for defect capsule rejection

5.2.10 Adjustment of capsule joining (refer to Fig. 25, 26, 27)

Adjustment of length of capsule joined shall be made according to the different sizes and lengths or when replacing capsule. The clearance between joining baffle and the capsule in the die assembly should be preferably 0.5~0.8 mm. The clearance can be adjusted by replacing the gaskets of different thickness. To adjust the height of pushrod, place the joined capsule in the die assembly, adjust the length of bolt on the joining taper to such a position that when the pushrod is at the highest position, the column pin can just contact the lower part of capsule. If joining capsule seems not normal in the course of filling, e.g., the capsule is too long to join or too short to maintain regular shape, re-adjustment shall be made carefully. After the adjustment, fasten the nut.

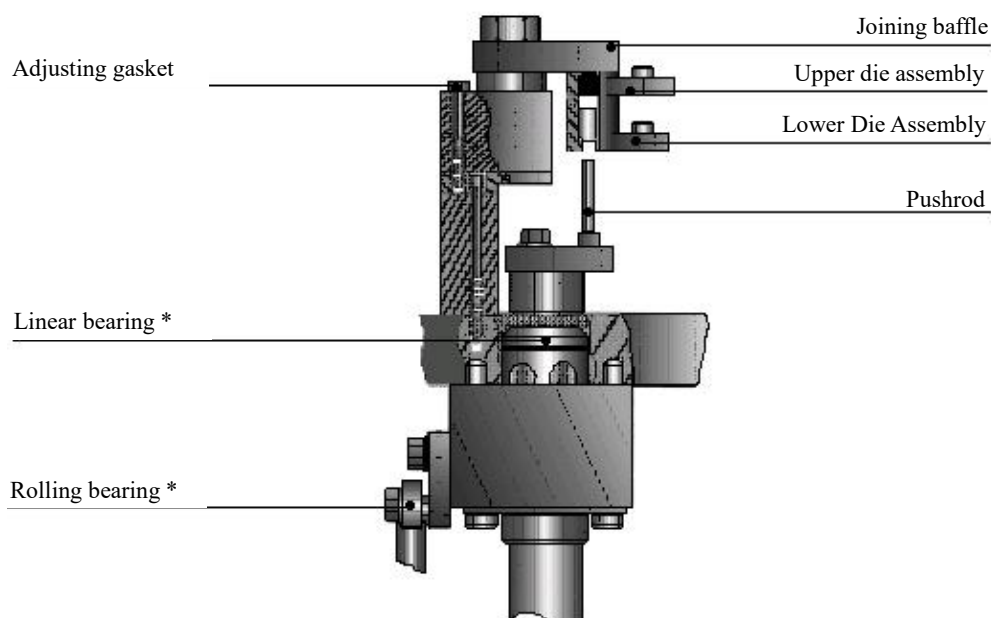


Fig. 25 Mechanism of Capsule Joining

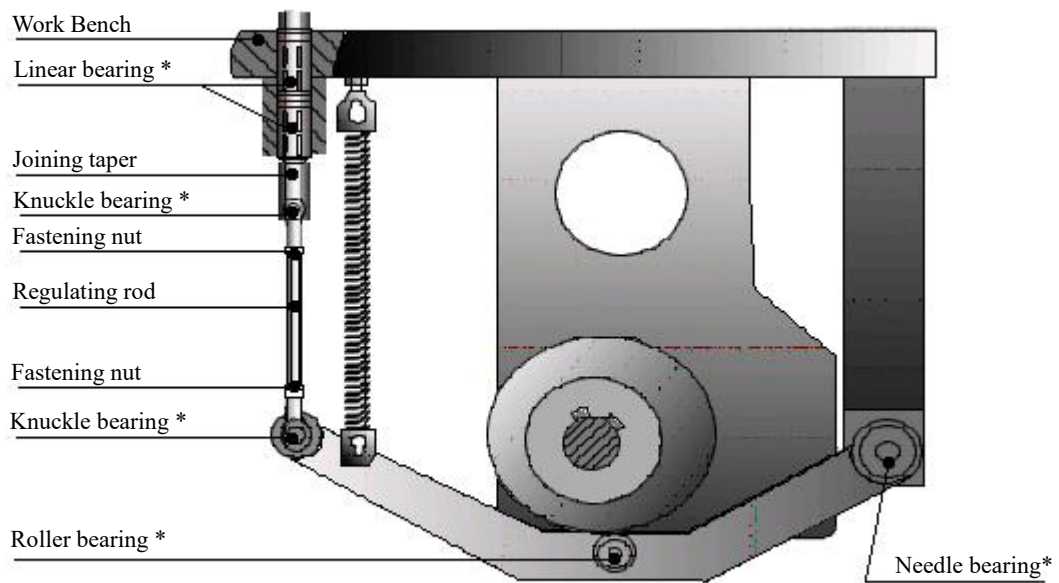


Fig. 26 Driving Mechanism for Joining Capsule

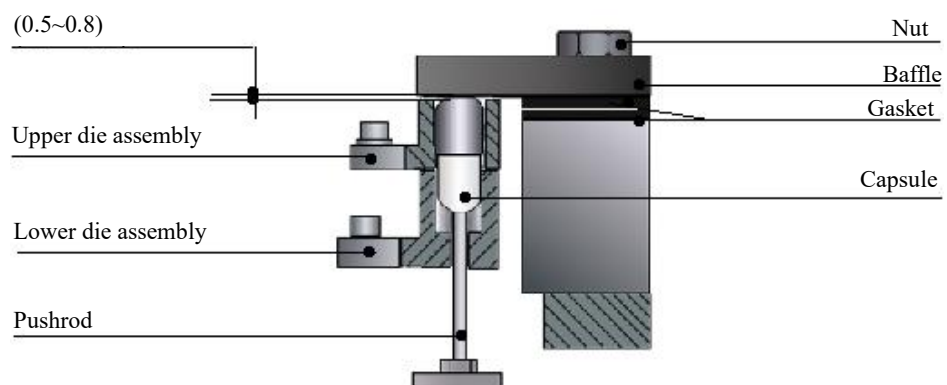


Fig. 27 Clearance between Baffle and Capsule

5.2.11 Adjustment of leading-out unit for finished product (refer to Fig. 28, 29)

Adjustment of lead-out unit for finished product consists of joined capsule guide plate and pushrod adjustment. Joined capsule guide plate has guide grooves with the same distance as die assembly holes. Loosen fastening nut on guide plate on both sides; adjust the angle and height of guide plate so that guide grooves can align with the joined capsule that is driven out. The standard is to lead out joined capsules smoothly. Finally fasten the nut.

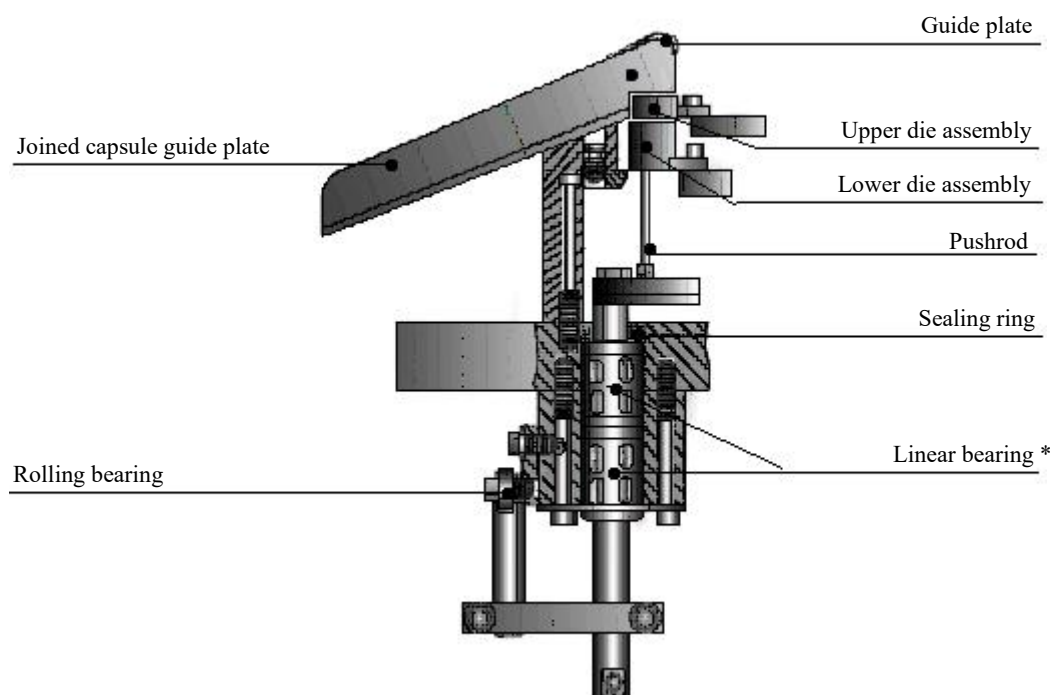


Fig. 28 Leading-out Unit for Joined Capsule

The method of adjusting joined capsule crown rod is the same as adjusting joining crown rod. As illustrated in Fig. 26 and explained in Section 5.2.10, you may adjust pushrod height so as to eject capsules when pushrod arrives at the highest position. When pushrod arrives at the lowest position, the upper surface shall be lower than the lower surface of lower die assembly.

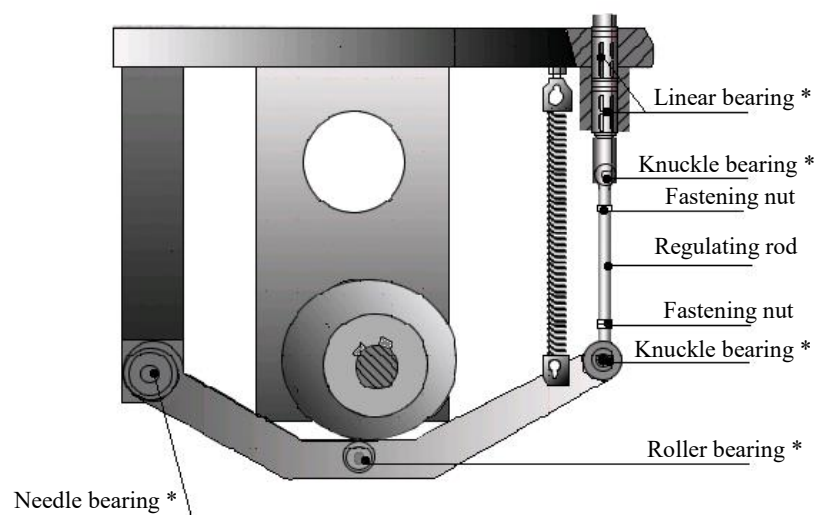


Fig. 29 Driving Mechanism for Leading-out Unit for Joined Capsule

5.2.12 Adjustment of Overload Clutch (refer to Fig. 30)

Overload clutch is a device installed in the output end of main motor reductor. Overload clutch can protect the machine in case of overload. Overload clutch should not slip under normal load. Since slippery may occur in long-term operation, the round nut of overload clutch should be tightened to guarantee both the normal operation and protective function.

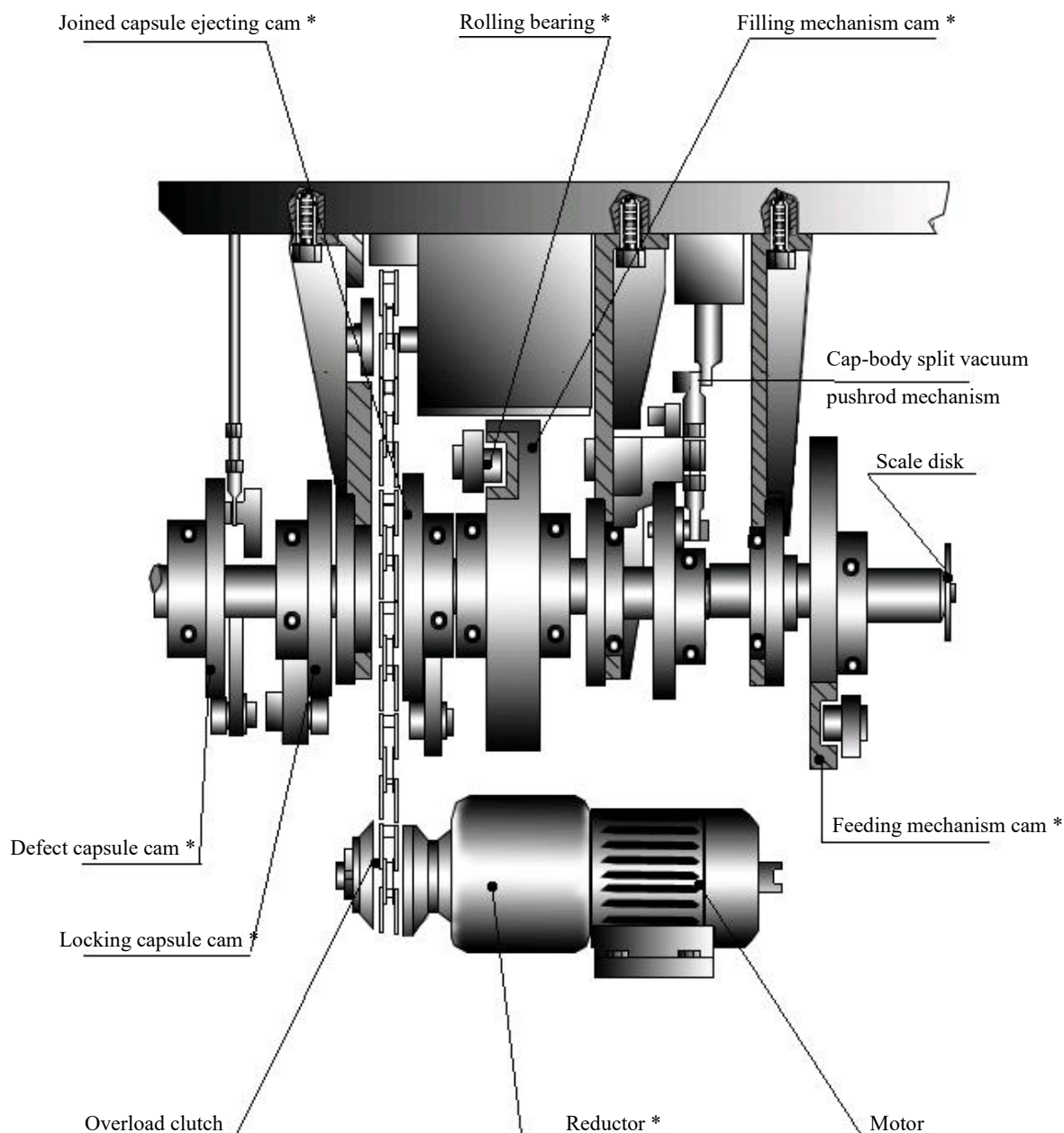


Fig. 30 Transmission Gear

5.2.13 Adjustment of driving cam (refer to Fig. 31)

The positions of driving cam are regulated at factory before the delivery. Do not adjust these positions in normal condition. Should adjustment be made, carefully adjust in accordance with the angle given by the Fig. 31.

Front View of Scale Disk

When cam position is as illustrated in the following figures, the indicating angle of scale disk of main arbor is as follows:

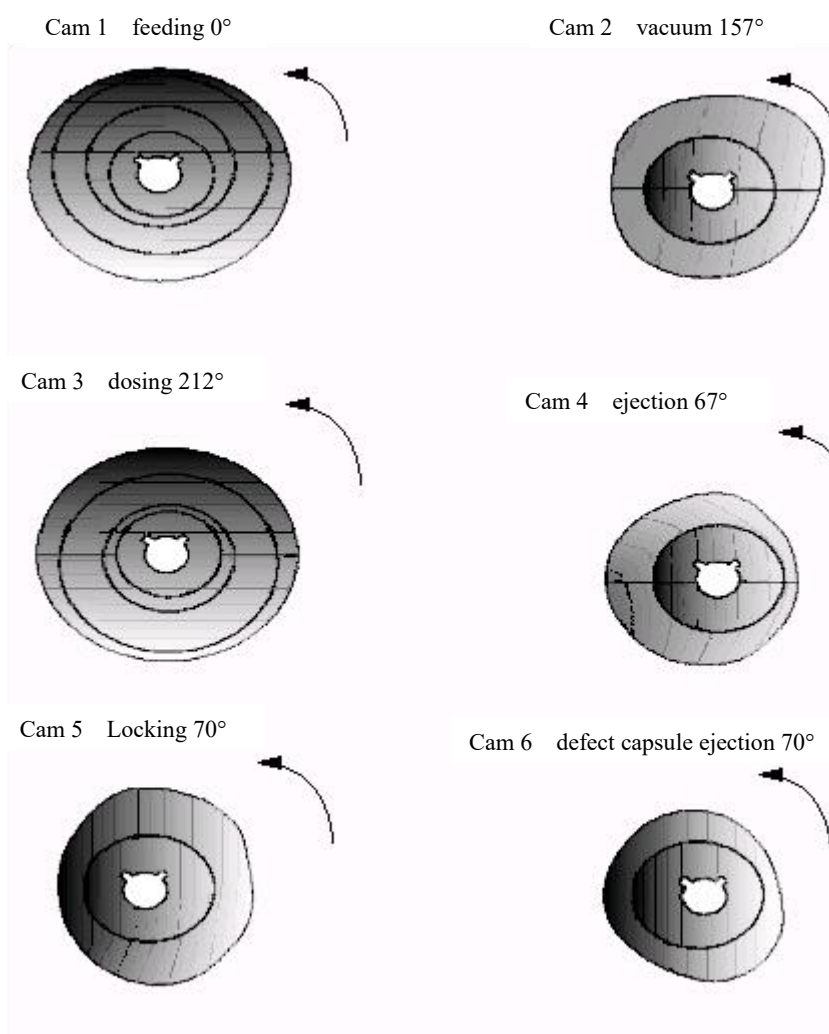


Fig. 31 Angle of Installation of Six Cams on Main Arbor

5.2.14 Adjustment of driving chain (refer to Fig. 32)

If you find the chain is too loose, you can adjust the chain by moving jockey pulley but neither let the chain go off any chain pulley nor unlock the chain, otherwise the movement order of the whole mechanism will be disturbed.

Check the chain once a week. Tighten and lubricate the chain if necessary.

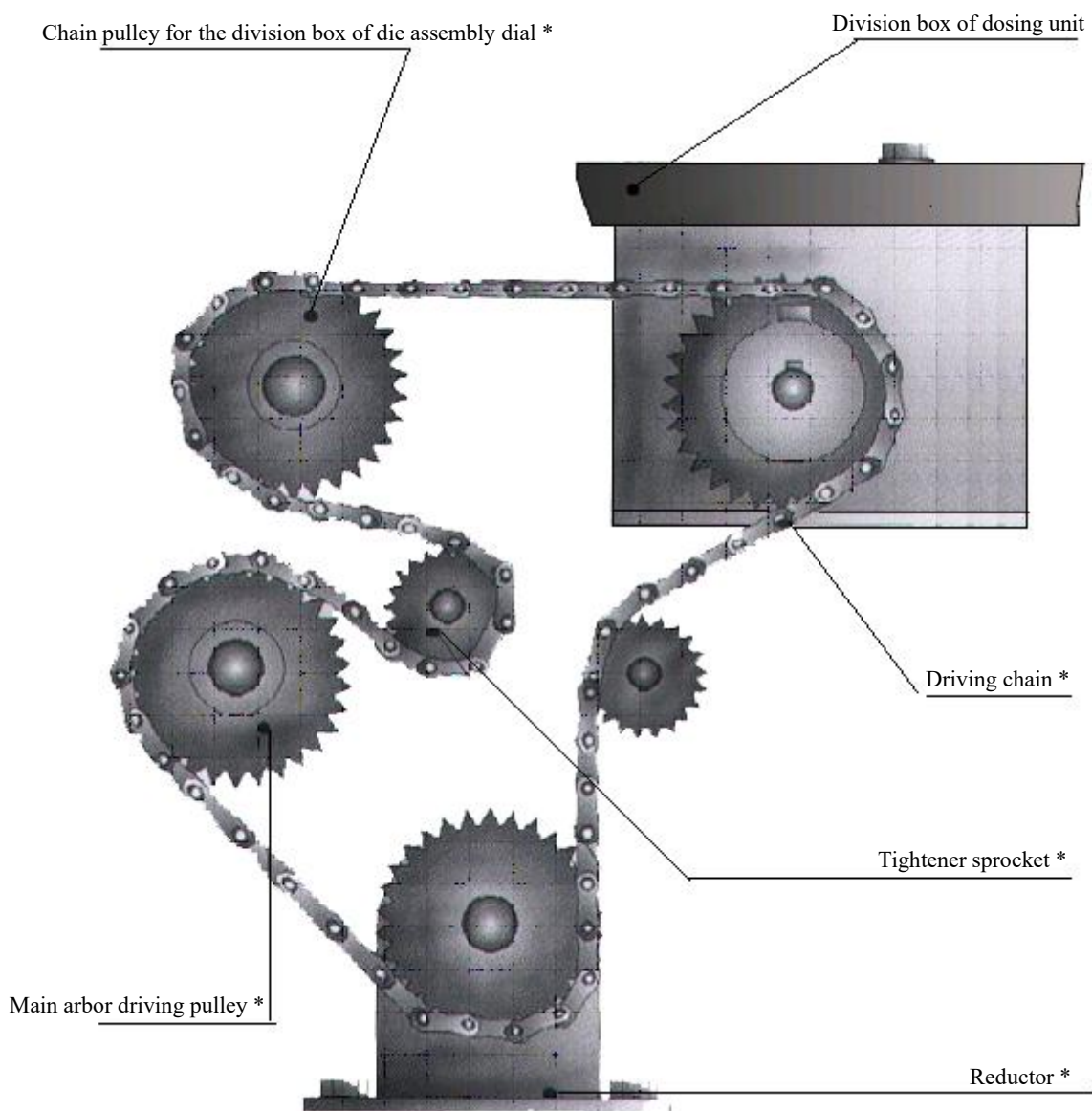


Fig. 32 Schematic Diagram of Driving Chain

5.2.15 Adjustment of Vacuum (refer to Fig. 33)

Clean water is used in water-ring vacuum pump with a low water flow. Vacuum degree can be controlled with a shutoff valve connecting to a vacuum gauge. Generally, -0.02~-0.06 MPa is advisable to guarantee the split of capsule without damage. With too high vacuum degree, open vacuum regulating valve to a larger extent. With too low vacuum degree, close vacuum regulating valve to a less extent or turn it off.

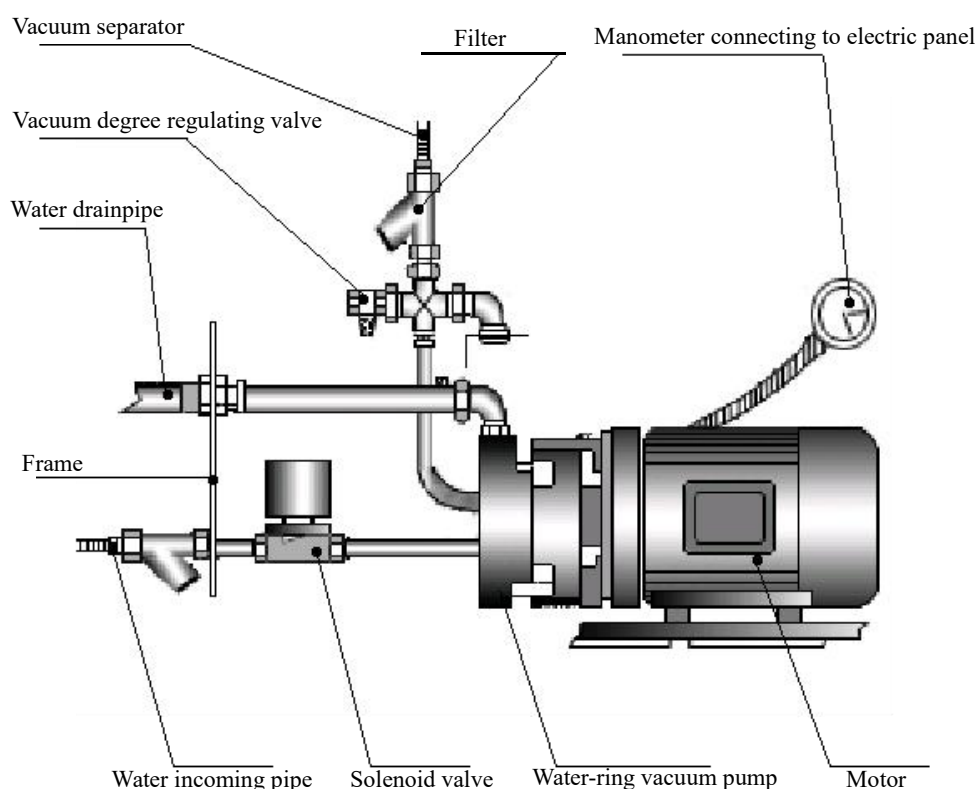


Fig. 33 Vacuum System

6. Start-up and Operation of the Machine (refer to Fig. 34)

The machine will be operated according to the introduction of screen with human-machine interface. So operator must read operation guide, pass relative exam, avoid produce waster.

Check the machine before starting the machine. Rotate the arbor wheel of main motor with hand crank to run the machine for 1~3 rotations. Then turn on the power switch, the Fig.1 (Operation Guide) will be shown on screen. For operation, please refer to “Operation Guide Of the touch screen For NJP-C Fully Automatic Capsule Filling Machine”.

Electrical cabinet operation panel



Power
Switch

Emergency
Stop

Jog

Fig. 34

7. Operation Guide

Operation Guide of the Touch Screen

For NJP-C Fully Automatic Capsule Filling Machine

Preface

Thanks for purchasing the full automatic capsule filling machine produced by our company.

This operation manual clearly introduced the working process, method and related cautions for the whole universal type automatic control system. Before you use this control system, please read this operation manual carefully to make sure you use it correctly.

Safety caution:

Before installation, running, maintenance, inspection, please read this operation manual and its attached files in order to use it correctly. Also please use it after you have a good knowledge of the equipment details, safety information and cautions.

Attention:

- ◆ please install it on incombustible things like metal to avoid fire
- ◆ Please don't get close to combustible things, and please put down gently when carry them.
- ◆ Connect the wire only when you make sure the power is off, and also please make sure the earth wire is connected. Please entrust the professional electrician to connect the wire and after that please also inspect if there is any error in order to avoid any electric shock or fire disaster.
- ◆ Please don't operate the interface or button with wet hand, people who are not appointed are not allowed to do the maintenance, inspection or changing the parts. (Before doing this, please take off the metal things like watch) Please use the insulated protective tools to avoid electric shock or any hurt.
- ◆ Please don't change the electric control system at will, in case the machine can't run normally. The machine can't be operated in the open air .Also please pay attention to the water proof and dust proof.
- ◆ The machine should be operated and maintenance by the professional person, please don't change the circuit at will.
- ◆ Before start the machine, please check the power supply circuit and if

there is anything inside the machine.

- ◆ Machine should be earthed.
- ◆ The machine operator should be trained before operate the machine.

Electrical cabinet operation panel



**Power
Switch**

**Emergency
Stop**

Jog

Touch screen control diagram

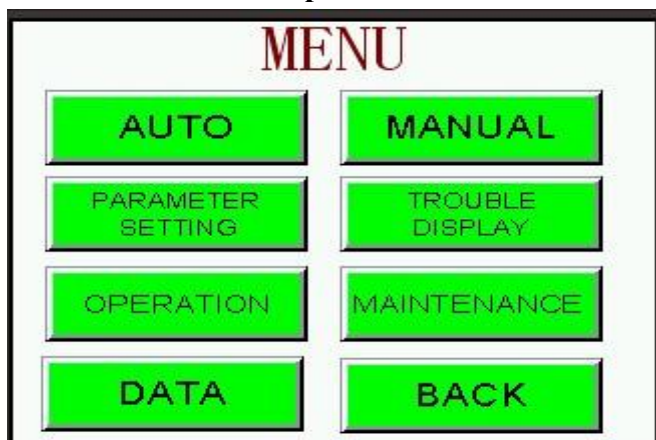
7. 1. Turn on the power switch, enter the home screen as shown in FIG 1 to choose the language



(Fig 1)

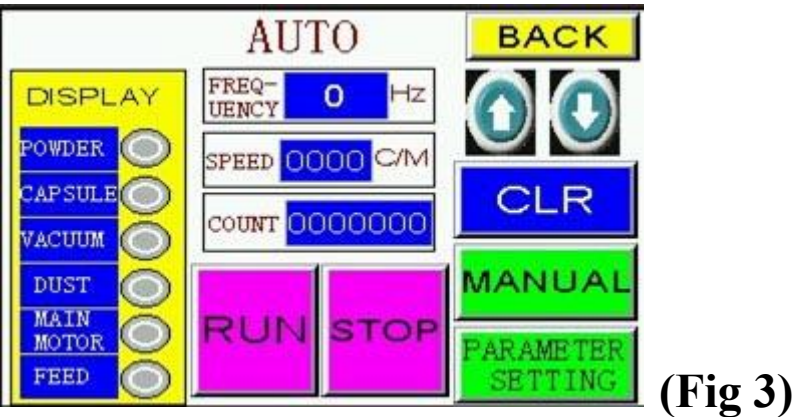
7. 2. Press  to enter operation menu as shown in Fig 2.

Operation menu



(Fig 2)

7. 3. Press  to enter Fig 3

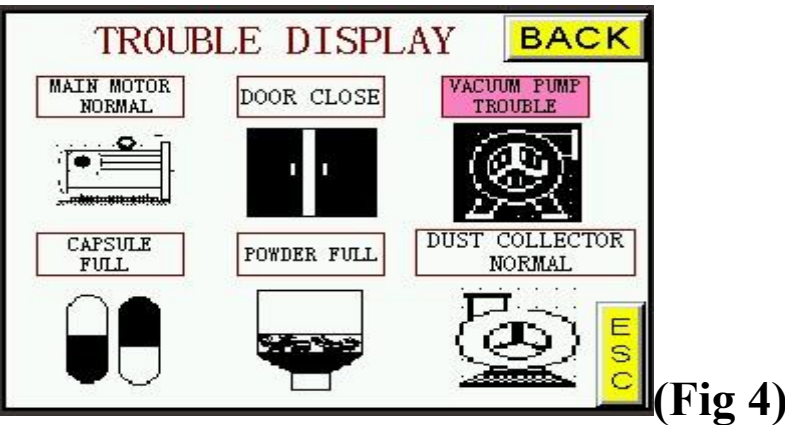


The operation steps are as following;

A-Press  button in FIG 3 to realize the whole machine operation.

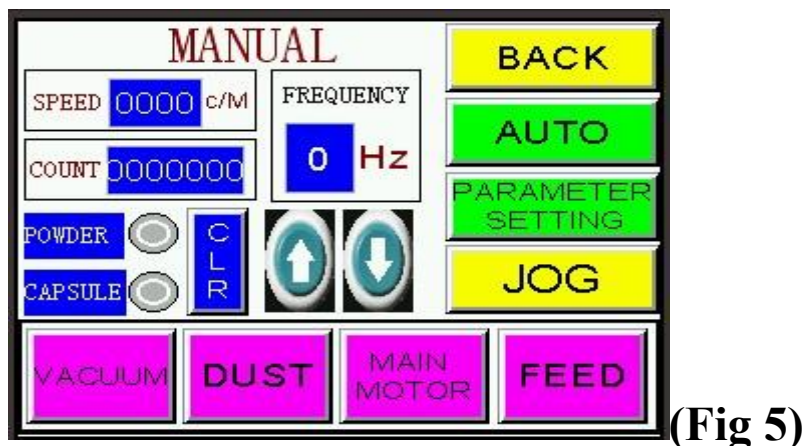
B-The  is to adjust  to control the machine speed.

C-In Fig 3, when there is any failure, or the door is not well closed, it will jump to the display as following:



Check the failure and solve it, press , then press  to come back to FIG 2 to start new operation.

7. 4. Press **MANUAL** in FIG 2 to jump to this following display.



A-  in FIG 5 is to adjust the main motor speed.

B-Keep pressing on **JOG**, the main motor start to rotate, loose it the main motor stop rotating.

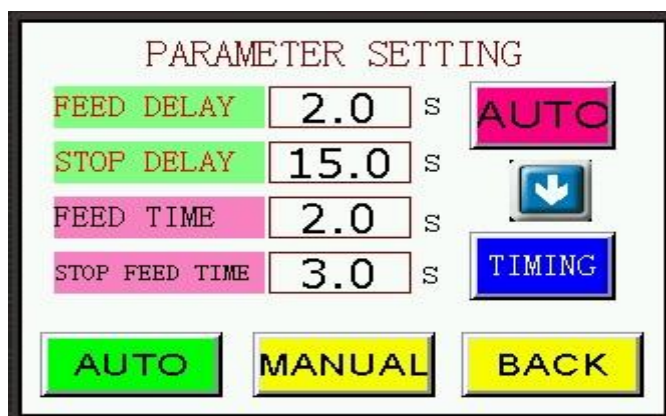
C-Press **VACUUM** for once, the vacuum pump is turned on, press it again, vacuum pump is turned off.

D-Press **DUST** for once, the dust collector is turned on, press it again, the dust collector is turned off.

E-Press **MAIN MOTOR** for once, the main motor will start, press it again, the main motor is turned off.

F-Keep pressing on **FEED**, the feeding motor start to rotate, loose it the feeding motor stops rotating.

7. 5. Press **PARAMETER SETTING** in FIG 2 to jump to this following display



(Fig 6)

The **AUTO** **TIMING** shown in Fig 6 is to control the feeding motor. When press **AUTO**, the **FEED DELAY** **2.0** s **STOP DELAY** **15.0** s will work; When press **TIMING**, the **FEED TIME** **2.0** s **STOP FEED TIME** **3.0** s will work. This is specially designed for different powder, the time can be set, and the detail setting is as following:

A-With automatic operation, in **AUTO**, the time in **FEED DELAY** **2.0** s refers to how much time the feeding motor will continue to run when the powder level sensor inspects there is enough powder. With the running of the machine, the powder will be less and less. When there is no signal from the powder level sensor, the feeding motor will start to rotate immediately to feed in the powder until the powder level sensor inspects there is enough powder, then the feeding motor will still run as per the time in the **FEED DELAY** **2.0** s, after this the feeding motor will stop the feeding. The time in. **STOP DELAY** **15.0** s means when the feeding motor runs the set time, but still the powder level sensor still has no signal, so this indicates there is no powder in the hopper, so the machine will stop. At the same time, the display will jump to the alarm display picture in FIG 4 to give alarm to the operator to realize feeding control.

B-When machine is in auto operation in **TIMING**, the feeding is realized by circulatory control for the feeding motor as following:

The feeding motor runs the time in **FEED TIME** **2.0** s, then stop

the time in **STOP FEED TIME** **3.0** s, run again the time in **FEED TIME** **2.0** s, then stop the time in **STOP FEED TIME** **3.0** s.

8. Maintenance and Cleaning of the Machine

8.1 In long operation of the machine, regularly clean the parts that contact powder directly. Also clean these parts when replacing another kind of medicine powder or shutdown for a long time.

8.2 Often wipe greasy dirt at driving parts in the lower part of the machine to view the running state more clearly.

8.3 Regularly open and clean the filter of vacuum system. (refer to Fig. 33)

8.4 Lubrication of machine

8.4.1 Coating the working surface of roller of all cams with grease weekly.

8.4.2 Drip lubrication in the joint bearings of all connecting rod under the working bench weekly.

8.4.3 Clean and lubricate all kinds of bearings regularly or according to operation situation. Drip lubrication in sealed bearings.

8.4.4 Check and lubricate the driving chain for tightness weekly.

8.4.5 Check the main driving reducer and powder-feeding reducer for oil volume monthly. Fill oil in time. Replace lubrication every half year.

8.4.6 Station division box under the revolving platform and dosing disk shall be disassembled and maintained under the guidance of professional technicians.

8.4.7 After running for 1000 hours, two division boxes shall have the first replacement of lubrication oil, and later after every 3000 hours of running, a replacement of lubrication oil shall be made once; (90# engine oil is recommended here, viscosity $\approx$ 680~460)

8.4.8 Remove cover plate of revolving platform every week and lubricate T-type shaft and brass sleeve and bearing of moving points in guide rod. Every 1000 work hours, uninstall T-type shaft and sealing ring for complete cleaning, replacement and lubrication once.

Table of Lubricating Oil

Lubricating Oil	Grade No.	Part to lubricate
Machine oil	N4B GB443-84	Chain, guiding part
No. 2 lithium base grease	ZL2 SY1412-75	Cam, rolling bearing, chain
No. 0 lithium base grease	ZLD SY1412-75	Division box, speed reducer

9. Table: familiar malfunction obviating

Malfunction state	Malfunction cause	Obviating method
Capsule can't be conveyed	Intake of capsule convey plate is jammed by defect capsules	Remove defect capsules from capsule tank by long pin.
	The switch of conveying capsule is too big or too small.	Adjust the position of convey capsule.
	The immobility of capsule piece is damaged or position is not accurate.	Replace the immobility of capsule piece or adjust its angles.
Low ratio of capsule mount	The horizontal fork of the correct position is before or behind.	Adjust the position of horizontal fork.
Capsule caps can't enter upper mold block to split.	Vacuum pressure is too big.	Adjust vacuum valves to change vacuum pressure.
Capsules can't be split normally	Vacuum is too low.	Adjust vacuum valves to change vacuum.
	The holes of mold block are too dirty.	Cleaning the hole of upper mold block and the hole of lower mold block.
	The concentricity of mold block holes is not accurate.	Regulate their concentricity with regulating rod.
	Capsule fragments is jammed by air vent of sucker capsule	Cleaning capsule fragments with a pin hook.
	Mold block is damaged.	Replace mold block.
	Vacuum pipeline is jammed.	Cleaning vacuum pipeline.
Capsules locked in position and crack as well as pit phenomenon appears.	The concentricity of mold block holes is not accurate.	Regulate their concentricity with regulating rod.
	Point pin of locking capsule is torched.	Adjust or replace point pin of locking capsule.
	End surface of point pin is dirty.	Cleaning the end surface of point pin.
	The position of point pin is too high.	Adjust height of point pin.
	The holes of mold block are damaged or wear.	Replace mold block.
The position of capsule locking is incorrect.	The position of point pin is too low.	Adjust height of point pin.
	Dosage is excessive.	Adjust by manufacturer
Main motor stopped by fault.	The friction disk of clutch is loosened.	Adjust the pressure of the friction piece
	The friction between dosage disk lower face and copper ring upper face is too big.	1.reduce the relative humidity of production environment. 2.adjust the clearance of dosage disk lower level.

10. Electrical Principle Diagram

