Your Reliable Partner -Pharmaceutical Machinery

Operational Manual

Model NJP-800C-2

Automatic Capsule Filling Machine

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1.Preface

With the increasingly renewal of pharmaceutical machinery, how to improve the automatic level and productivity of pharmaceutical equipments has been the urgent demand of pharmaceutical enterprises. In order to suit the production and developing needs of large-sized, and small-sized pharmaceutical factories, our factory has successfully developed the Fully-automatic Sealing Hard Capsule Filling Machines of NJP-800A, 500A,400A,200A-M structure on the base of producing series of NJP Filling Machine. Its structure, power control system, vacuum and dust system , etc. with creative improving design, Many technical indexes have achieved the leading level in the international products of the same filed, it is a kind of high technical product integrating machine, electricity with air. At present, it's a most ideal and perfect filling equipments of producing capsules at home.

The main parts:

- ✧ Totally close working-position turning table can solve the inconvenience of cleaning the mode and the hard adjustment of the precision of reload mode.
- ✧ Working-position adopts the down can structure with excellent lubrication performance. It can improve the using life of parts.
- ✧ Adopt the electronic program controller of pharmaceutical machine. It has a strong anti-interference, steady features long life of span and lower troubles.
- ✧ Adopt stainless steel and high bright big square button. It has a beautiful overall, long life of span, reliability and safety.

This machine can replace the parts such as mode, etc. it is suitable for all assortments of specifications.(00"—4")

The main contents of this operation manual: technical parameters, working

principle, installation & debugging, maintenance & upkeep and troubles shoot.

2.Main technical parameters

Production ability: 800/min 500/min

400/min 200/min

Power: 380V 50HZ three-phase four-wire system

Total power: 5KW

Overall dimensions: (L X W X H) 1000 x 820 x 1700mm

900 x 720 x 1700mm

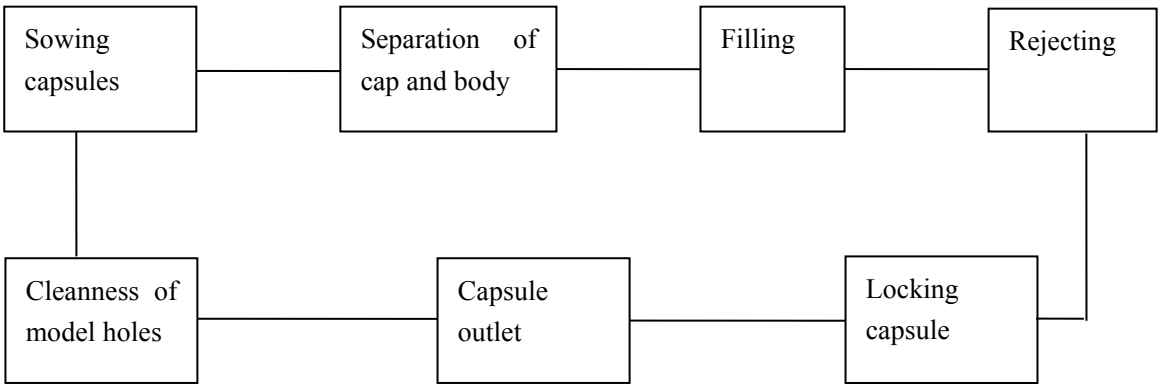
Weight: 850kgs, 650kgs

Other equipments: series of SK Water-circulating Vacuum Pump, the duster with bleeding rate of 45 m3/h.

3.Working Principle & Main Structure:

working principle

working procedures are as follows:



3.2 Main structures

3.2.1 machinery part

This machinery is divided into up and down parts.

Up working part: it is composed of sowing capsules(see Fig 3), working-position(see fig 6), filling (see fig 7), bin (see fig 14), rejecting capsule(see fig 15), locking capsule(see fig 16), capsule outlet(see fig 17), suction(see fig 18) etc.

Down parts: it is composed of driving mechanism(see fig 16) and driving chain(see fig 22),etc

3.2.2 Pneumatic parts(see fig 18, fig 23)

This machine utilizes vacuum pump to suck and to separate the cap and body

of capsules. It is also used in the industrial duster to clean the dust of abandoned capsules.

3.2.3 Electrical part

This machine adopt(UART) special electronic program controller and frequency infinitely speed regulation, etc

4.Installation & Debugging

4.1 Installation

4.1.1 Location of main machine

The shipment and placing of this machine should be light to avoid the damage of the computer. When locating, pad the base with rubber board to avoid shaking. The table level should not be waved.

4.1.2 Environment demands

Environment temperature: 21+/-3C

Relative humidity: 45-50%

4.1.3 Installation for auxiliary machine

Auxiliary machine-----vacuum pump, duster had better separate to install with main machine in order to reduce the noise.

4.1.4 Connect vacuum pump, duster and main air pipe

4.1.5 Connect the power. Note that the voltage should meet the demand of the

main machine.

4.2Debugging

4.2.1 Examine the fasteners such as bolt, screw, nut and pin, etc in every part of the whole machine to see if they are loose of not(it is caused by the shake in the course of shipment)

4.2.2 Put the hand-wheel into the neck of the main motor tail. Rotate with hands to make the working-position to rotate for 3-5 circles. Observe every part to see weather they can coordinate normally or not.

4.2.3 Connect the power switch and see fig 6(the start and operation of machine) to start the machine to dry run for 1-2 hours.

5.Adjustment of Machine

Before out of the factory, this machine has been debugged strictly and every part has been debugged well. When discharge and clean(change the modules of the capsule), the machine should be adjusted again. The main aspects are as followings(rotate artificially the main motor no matter adjusting any mechanism)

5.1 Machinery adjustment

5.1.1 Adjustment of capsule filler door

The height of filling door is controlled by nut. Regulate the height to change the discharging area, accumulation height of capsules. The height is the 1/2 of the height of main outlet.

5.1.2 Adjustment of compressed spring slice(see fig 5)

Manually regulate the compressing depth of compressed spring slice to ensure the rear capsule to be locked in the pipe by compressed spring slice when slowing one capsule every time.

5.1.3 Adjustment of sowing capsules pipe(see fig 3, fig 4)

Many functions of sowing capsules pipe: capsules entering, capsules store, capsules outlet, and capsules pushing, etc. move back and forth. The down pulling rod of machine controls the gap of capsule and sowing capsules pipe. Regulate the length of pulling rod(two-headed screw).the gap is 3-4mm.

5.1.4 Adjustment of vacuum separation set(see fig 18)

When it doesn't work, the gap of sliding plate and down mode is 0.8-1mm.regulating the pulling rod can solve it.

5.1.5 Calibration of down mode(see fig.9)

The up mode of machine makes the circular motion and the down mode makes the cross motion. The gap of up and down mode is 0.3-0.5mm. the calibrating methods: adopt two calibrating sticks to calibrate the concentric degree of mode holes. The range is 0.01-0.02mm. when cleaning the mode. Do not need to discharge. This mechanism is the best part in the same kind of products after improving because the working-position part is sealed combination.

5.1.6 Adjustment of gap of dose plate and sealing ring.

The gap of dose plate and pad plate is 0.03-0.08mm. the adjusting methods:

loose the nut. Rotate the regulating bolt, change the height of sealing ring and equip with the feeler ruler to regulate the gap. After finishing, fasten the screw and nut. After long time running, the gap face of machine should be discharged and cleaned. The discharging method can see fig 7, fig 8, fig 11 and fig 12.

5.1.7 Adjust the gap of powder fending device(see fig 10)

The gap of powder fending device and dose plate is 0.05-0.1mm. adjusting methods: loosen the screw, discharge the pad slice, and ensure the gap by the thickness of pad slice. Fasten the screw after calibrating with the ruler.

5.1.8 adjustment of powder position bound detector

Condenser bound detector is used for controlling the height of powder position in the powder case. Regulate the height properly against the powder flow. The biggest height from level of dose plate is 50mm. loosen the fasten nut, there is 2-3mm from the end face of detector to locate plate. There is a small screw in the rear of the detector using for regulating the sensitivity.

5.1.9 the height adjustment of rod base and rod(see fig 8 and fig 10)

The density of dose and powder post: the depth of rod stretching into the dose plate can be regulated. If the depth regulation is correct. The powder quantity is correct too. Method: rotate the main shaft of main motor to make the parts of rod to come down at the lowest position. Regulate the end face of rod and the dose plate and record the zero point value(scale counting). Then put the rod orderly into the hole. Regulate the depth against the table in the following.

Parameters value

stop	1	2	3	4	5
The inserting depth	6	4	3	2	0.5

5.1.10Rejecting regulation of useless capsules

This machinery is composed of centre, handle, guidepost, locating block, and pulling rod, etc. the function is to reject the useless capsules whose cap and body are not separated. Then suck the useless capsules into the storage case with the suction mouth. Method: regulate the pulling rod to make the gap of handle level and up and down mode to keep in 1.5-2mm.

5.1.11 Adjustment of locking capsules

After filling, lock the cap and body. Method: rotate the pulling rod to make the distance between centre and up fending board is equal to the length after locking the capsules.(put the unlocked capsules into the front holes and turn to the locking position to observe and measure the length until calibration) then fasten the screw and nut.

5.1.12regulation of capsules outlet(see fig 17)

After locking the front position, the capsules have become the finished products. The products are pushed from this position. Method: (1) rotate the pulling

rod to lift the centre. The end face is 1-2mm higher than the up model level. When return, note that the gap of end face of centre and down model level should be kept in the range of 1.5-2mm. prevent collisions. (2) Adjust the guiding board. The air outlet hole should aimed at the two sides of capsules. When push out of the capsules, according to the suction direction to avoid the capsules in a mess.

5.1.13 Adjustment of safe clutch

When the machine is overload, this mechanism can protect it. The clutch should not skid around when the machine is running normally. Fasten the nut if it works for a long time.

5.1.14 adjustment of driving cam(see fig 19)

the position of cam is regulated well when the machine is equipped. So it needn't to adjust again to prevent interference in every part. Carefully adjust the angle and position against the fig 21 if you need urgent adjustment.

5.1.15 adjustment of driving chain(see fig 22)

the driving chain will become long and loose because of long time using. It will affect the driving precision. You can change the position of tension wheel and use the nut to fasten.(new added mechanism)

5.1.16 Vacuity adjustment(see fig 23 and fig 17)

This machine adopts series of SK water-circulating vacuum pump. The function of making the capsules in the correct position when putting them and separate the cap and the body.

Vacuity adjustment is controlled by one water-entering valve under the lower of the water container. The vacuum meter read the degree number. The range is between 0.04 and 0.08Mpa. this can ensure the normal separation of cap and body and will not damage the capsules.

5.1.17Duster adjustment

The function of duster: suck the dust and useless capsules in every working-position into the storage case. The holes of filter screen and sweep-up pipe are blocked because of long time working. So regularly discharge the filter screen and clean it. Or the unusual sound will appear in sweep-up pipe.

2. The start and operation of Machine

6.1Connect the total power: before starting the machine, completely examine the machine. Rotate the shaft wheel of main motor manually to make the machine rotate for 1-3 circulations. Ensure that the machinery part is normal, and then turn the main power switch.(QS) on the left of the controlling case at zero position to the one position. The indicating lights of stopping key of main machine and vacuum pump are on. The frequency speed regulators shows accordingly too.

6.2First start the vacuum pump motor M2, press the starting key (4QA) of vacuum pump, the indicating light(4XD) is on and then the vacuum pump start to work. First starting the machine should note the rotating direction of motor. Change the phase order of power if the direction is wrong.

6.3Start the main machine M1, press the starting key(1QA) of main machine and then the indicating light(1XD) is on. Accelerate the main motor from lower speed to higher and steady speed. The accelerating time is 10 seconds when the machine is out of the factory.

6.4Press the main machine-stopping key and vacuum pump stopping key make the main machine and vacuum pump stop.

6.5Converter speed adjustment: the converter controls the rotating speed of main motor. Press the keys ▲ or ▼ on the operating panel of converter to change the rotating speed of main motor. The keys can make the rotating speed of main motor to rise or decline. The running speed of main machine is fixed against the actual demands of users. See the concrete technical data in the converter operational manual.

6.6The start of feeding motor M3. please press the manual feeding key (2QA), the indicating light is on. This key is only used for inching and generally used for machine test. The feeding system is fully automatic controlled when the machine is normally working.

6.7The fully automatic control of feeding: the medicine amount is automatically controlled by feeding position sensor. When regulating the height of feed position sensor. The feeding motor will automatically stop and start as well as control the ration powder in the medicine room. When the material is run out, in 1-4 minutes if no material is fed. The main motor will stop automatically. Users can adjust the

time-delaying rotary button and can also cat off the total power switch or press the urgent switch.

6.8 The usage of urgent switch:Press the urgent switch button on left side of the controlling case when the machine needs to stop at once.The main machine will stop at once and self-lock.Please open the self-lock of urgent switch if you want to start the machine again.Refer to according to the procedure6.1-6.3

6.9 The boby of machine should be grounded against the relevant demands to ensure the safety of epuipment and person.

6.10 The electrical panel and principle diagram should see the Fig.25,Fig.26 and Fig.27.

7. Maintenance and cleanness of machine

7.1 Regularly clean all the parts which directly touch the powder feeding after a long time working.If you want to change the products or stop using for a long time,you need to clean them too .The parts showed in the table are powder hopper,dose plate,powder case,powder cleaner,up and down mode and centre,etc. Use the alcohol to clean these parts but cannot use the etrol,kerosene,ether,and acetone etc to clean.

7.2 The dirty grease on the lower driving part of machine should be cleande and renewed regularly to ensure the normal running of the machine.

7.3 The filter of vacuum system should be cleaned at regular intervals(See

Fig.24).If the vacuum degree is not enough or the capsules cannot be separated,please examine the vacuum pump and water container as well as pipe to see if they are blocked.Change the water for 2-3 times one day if the temperature lift is up above 50℃.

7.4 Lubrication of machine

a. The inner oil adding method of working-position:the oil pump is epupped on the lower baseboard and is connected into the working-position with oil pipe.Inner oil sprinkler should be added oil once every week.

b. Add oil between all the bdaring and rubbing parts once every day.The“★”in the operational manual shows lubricating points.

c.Every bearing should be cleaned regularly or cleaned according to the using situation.For example,the sealed bearing should be lubricated.

d. Examine the tension of delivery chain every week and add the lubricating oil and grease.

e. Examine the oil amount of main speed reducer and feed speed reducer.If the oil position is low,add the oil.Change the oil every 6 months.

8、Parts changing

Because of the producing needing of pharmaceutical factory,change the capsule specs.(00″ ～4″). Only change the parts on the machine.

Note that when change and debug,only permit to rotate the main motor by

hands.

8.1 The changed parts:

Up and down mode,rod,dose plate,sowing capsule pipe and capsule comb,etc.

8.1.1 Up and down mode(See Fig,9 and Fig.24)

Loosen the screws of up mode and down mode,take down the mode and rod,and keep the locating board.Use the two calibrating sticks calibrate the down mode at the same tine on the base of front holes of locating board.Calibrate them one by one.On the base of down mode,calibrate up mode one by one in the working-position of lock,capsules outlet and sowing capsules.Then fasten the screw.

8.1.2 Punching Rod(See Fig.7,Fig.13)

When changing the punching rod,discharge the two up fasten bolts on the locating board and ratate the main shaft of motor by hands to make locating board and rotate with hands to make the two-guide posts back.Take down the rod,discharge the rod base and change another rod.Fasten the screws and equip them into the locating board.(Note that the rod head of 36 rods of 800A-M,24 rods of 500A-M,18 rods of 400A-M,and 12 rods of 250A-M should repair in the same level)

8.1.3 Dose plate(See Fig.7)

Discharge the rod part and then discharge the power holding board, powder storage ring part.At last,discharge the dose plate and change the new sose

plate:with 5 calibrating sticks to calibrate on the base of locating board.After concentricity,fasten the screw.First epuip the rod part and rotate with hands,observe the rod and holes of dose plate is aimed or not and correct line by line.The covering winping is not allowde.Idle for 3-5 circles ane then discharge the rod part after correct calibration.Then equip the powder storage ring,powder holding board and rod part orderly.After fastening,ratate it for 3-5 circles with hands to set the normal working-position.

8.1.4 Capsule sowing pipe(See Fig.3)

a. Loosen two screws of hopper and take down the screw and hopper.

b. Rotate the main motor by hands to make the capsule pipe to lift to the top.

c. Loosen two screws on the capsule pipe,take down two locating pins and parts of capsule pipe:Loosen one screw on the capsules sending cumb and take down the screw and comb.

d. Equip the changing part and capsule pipe parts:capsules sending comb.Equip the screw,locating pin orderly.Equip every part well according to the original position and calibrate the gap,then equip the hopper.On the base of up mode, put two calibrating sticks and aim at capsules sending comb.After calibrating, fasten three screws of sowing capsules.

9. After replacing every prat,rotate the shaft of main motor and observe the moving state of all parts. Wait the woking-position parts to ratate continuously for 3-5 circles to see it is normal, and then operate the machine(slowly).

Shaft Bearing Contents

Names	Models & specs	Producing area	Quantity
Straight line rolling bearing	Zxt10、19、29	Import	60
	Zxt12、22、32	Import	8
	Zxt20、32、34	Import	8
	Zxt30、47、68	Import	4
Roller pin bearing	524904	Made in China	2
(GB5801-86)	524905	Made in China	9
	6254905	Made in China	1
	4524911	Import	1
Continuous shaft roller	CF 6	Import	10
	CF 12	Import	5
	CF 18	Import	1
Ball bearing			
(GB278-82)	C-180018	Made in China	8
	180104	Made in China	
	C-180200	Import	10
	1208	Made in China	2
Regulating ball bearing			
(GB281-84)	62200	Import	2

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Lubrication system table

Names	Models	Lubricating parts
Machinery oil	N4B GB443-84	Chain,Roller Post Bearing, Guiding Parts
NO.2 Grease	ZL2 SY1412-75	Cam,Roller Pots Bearing,Chain
NO.0 Grease	ZLD SY1412-75	Distribution Box,Speed Reducer

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List of Electrical Units

Code number	Symbo 1	Names	Detailed specs.	Unit	Quantity	Remark
1	U	Frepuency speed egulator	N2-202-M	Piece	1	
2	M1	Main machine	Y90-4-1.5W	Table	1	
3	M2	Medicine ofering motor	JW6314-0.18	Table	1	
4	M3	Vacuum motor	Y90S-4-1.1	Table	1	
5	M4	Dust sucking mator	Y90S-4-2.2	Table	1	
6	QS	Unit switch	HZ5-20A	Piece	1	
7	UART-1	Controller		Piece	1	
8	M4	Exhaust blower		Piece	1	For special purpose
9	KM1	AC contactor	3TB41	Piece	1	
10	KM2	AC contactor	3TB41	Piece	1	Coil 220v
11	1-5QA	Button switch	Lights,Green3, Red2	Piece	5	Specially made
12	QDB	Solid relay	QDB210A-38 Or/10A	Piece	3	
13	LP	Feed position detector	LJC30A3-N	Piece	1	DC10-30V
14	TC	Control transformer	220V/17V	Piece	4	
15	TA	Urgent switch	LAY3	Piece	1	Self-lock
16						
17						

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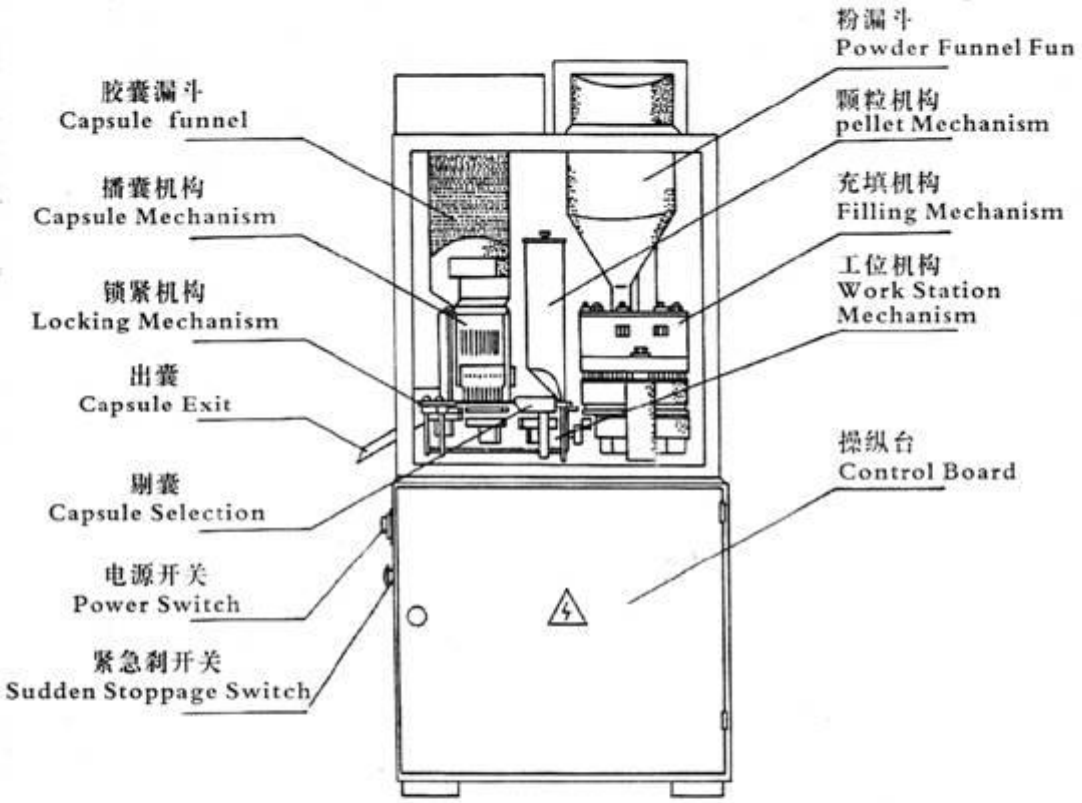


胶囊充填机
Capsule Filler

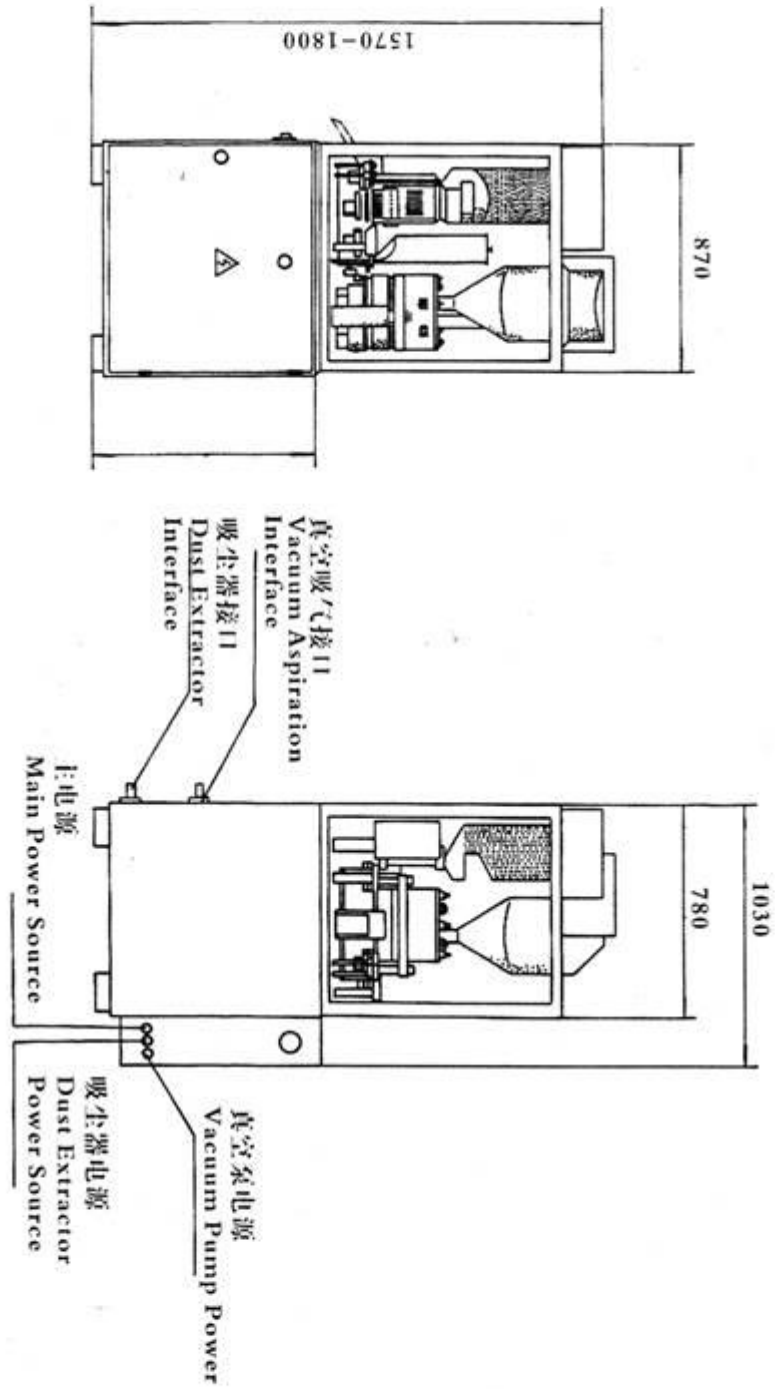
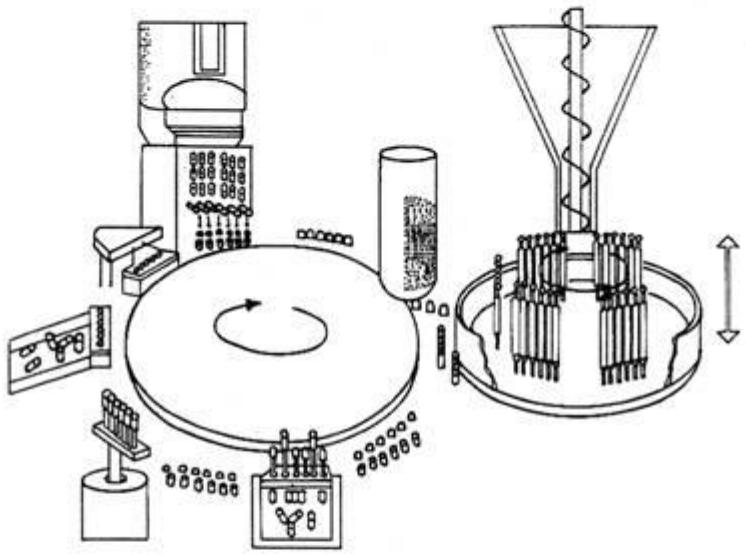


图1 外形尺寸

Figure1 Overall Dimension



10 工位 Work Station

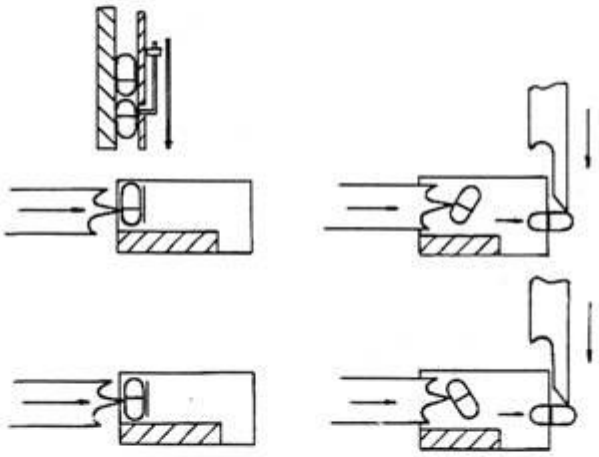


图2 胶囊定向排列流程

Figure2 Capsule Direction Arrangement Flowing

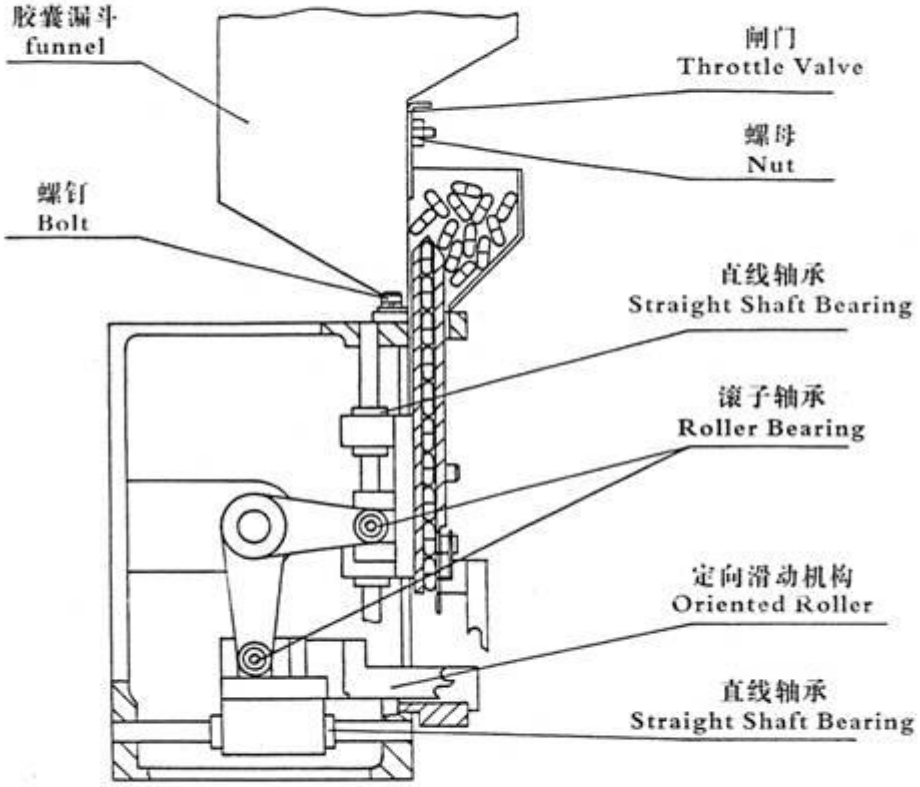


图3 播囊机构
Figure 3 Capsule Sower

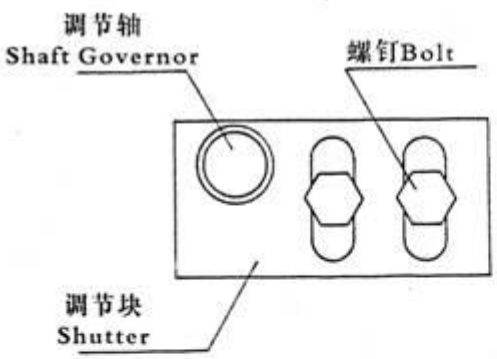


图4 调节块
Figure4 Shutter

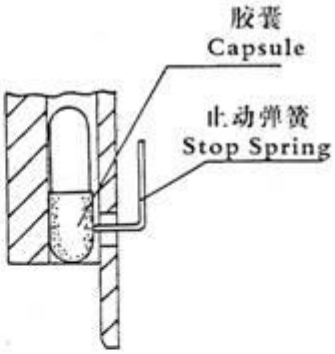


图5 止动弹簧
Figure5 Stop Spring

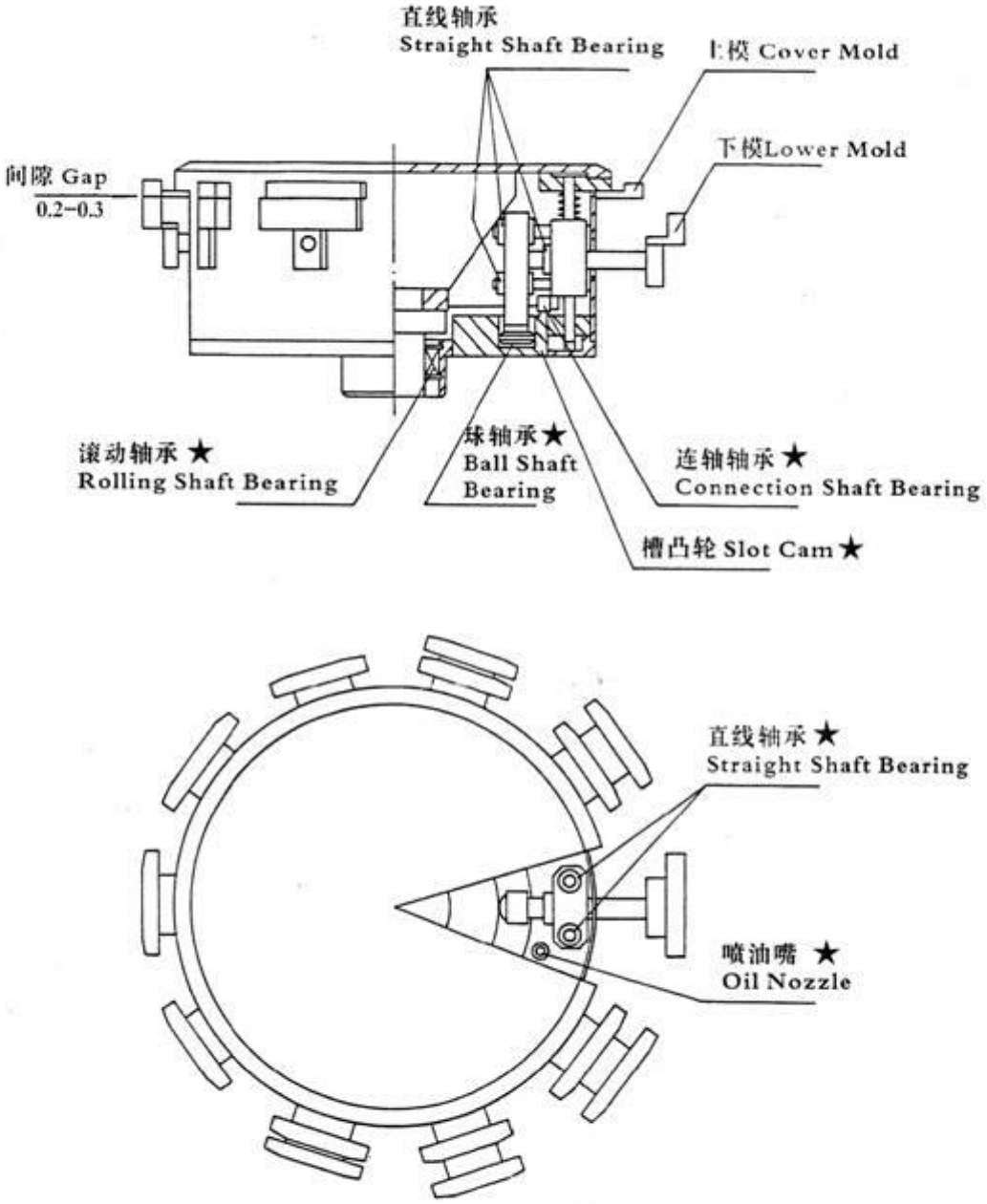


图6 工位部分
Figure 6 Part Of Work Station

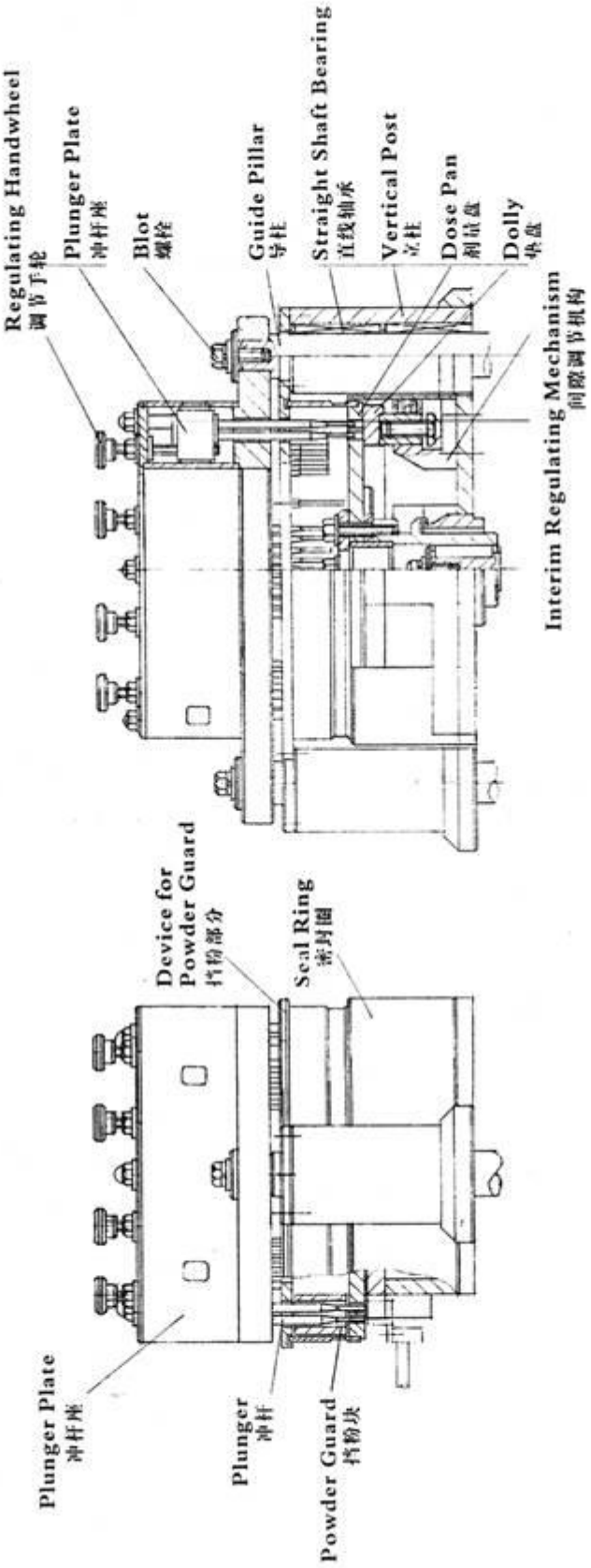


图 7 充填部分
Figure 7 Part of Fill

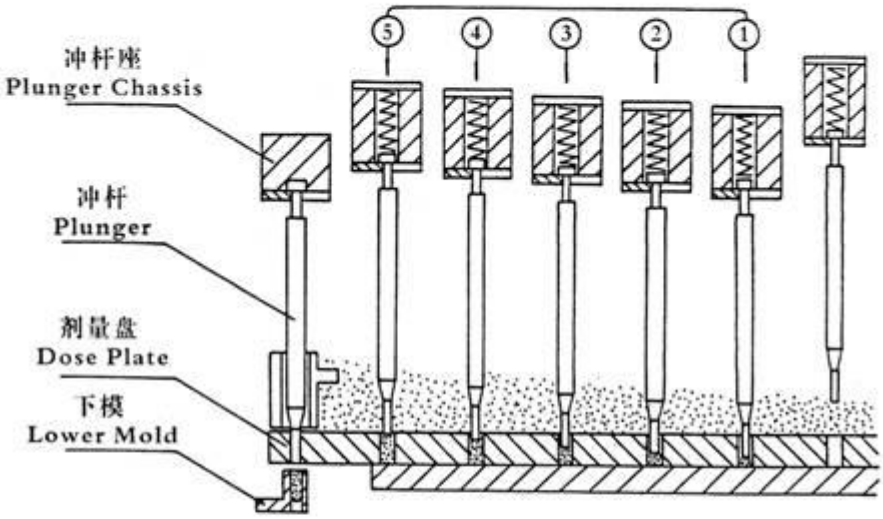


图8 充填步骤 Figure8 Filling Phase

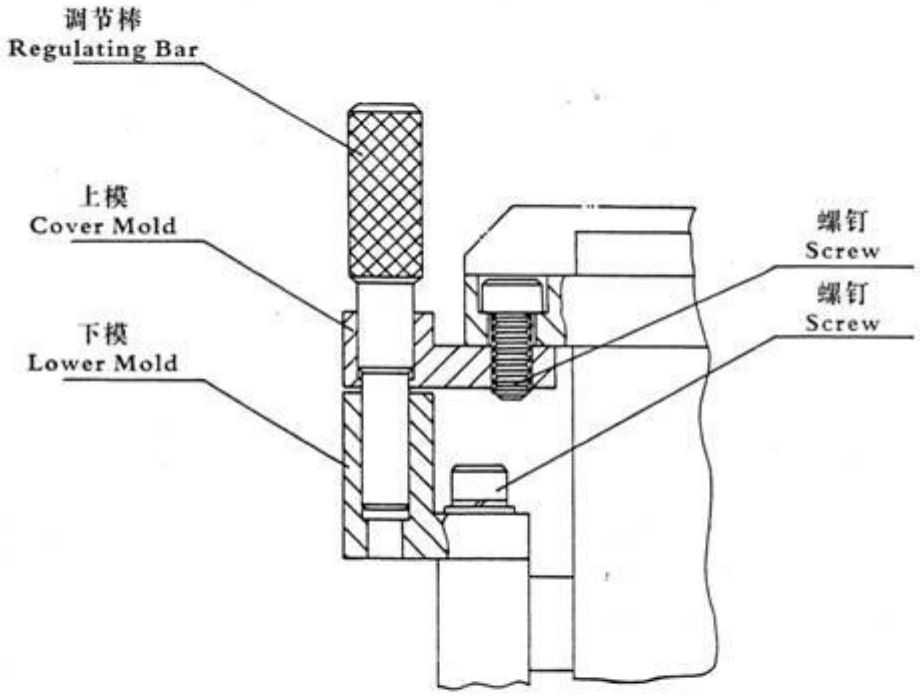


图9 上下模中心调节
Figure 9 Center Adjustment For The Cover And Lower Molds

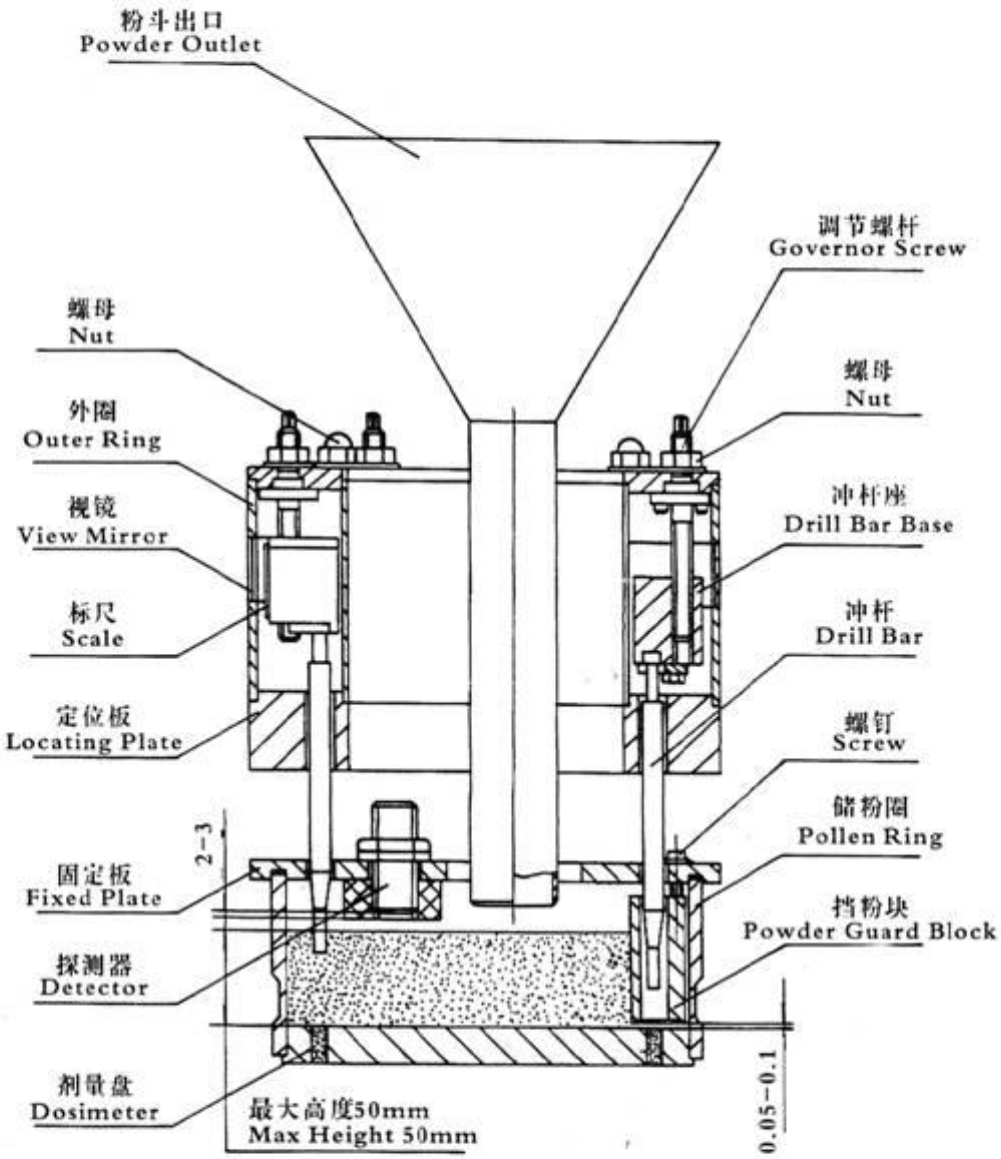


图10 储粉箱（室）剖面图

Figure 10 Sectional View of Powder Chamber

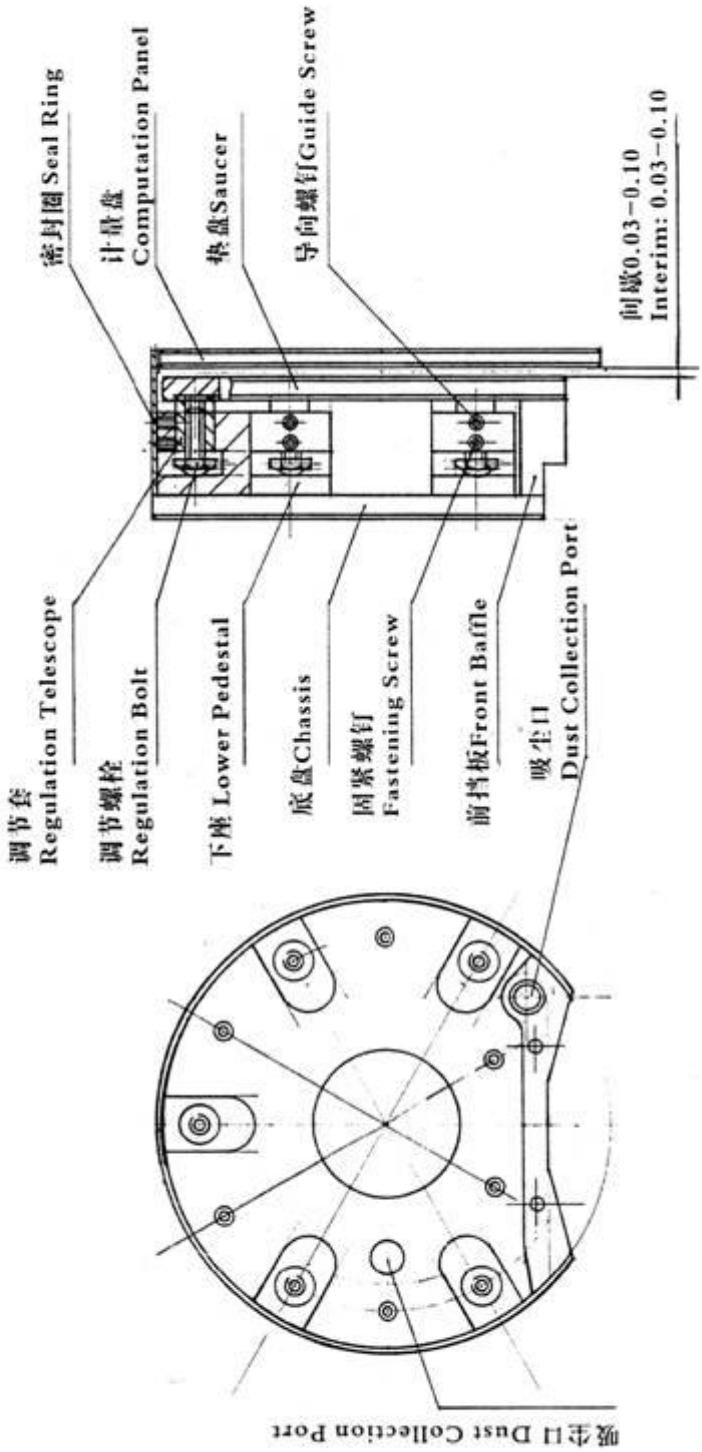


图11 垫盘间隙调节结构

Figure 11 Structure Of Gap Regulation For Saucer

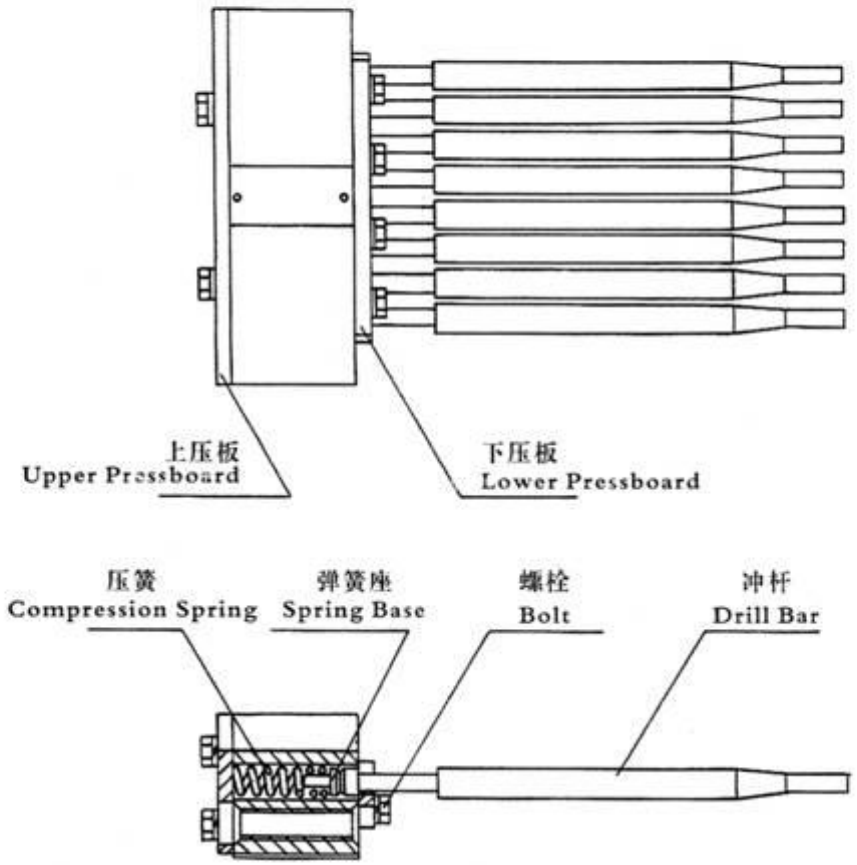


图13 冲杆组件
Figure13 Plunger Assembly

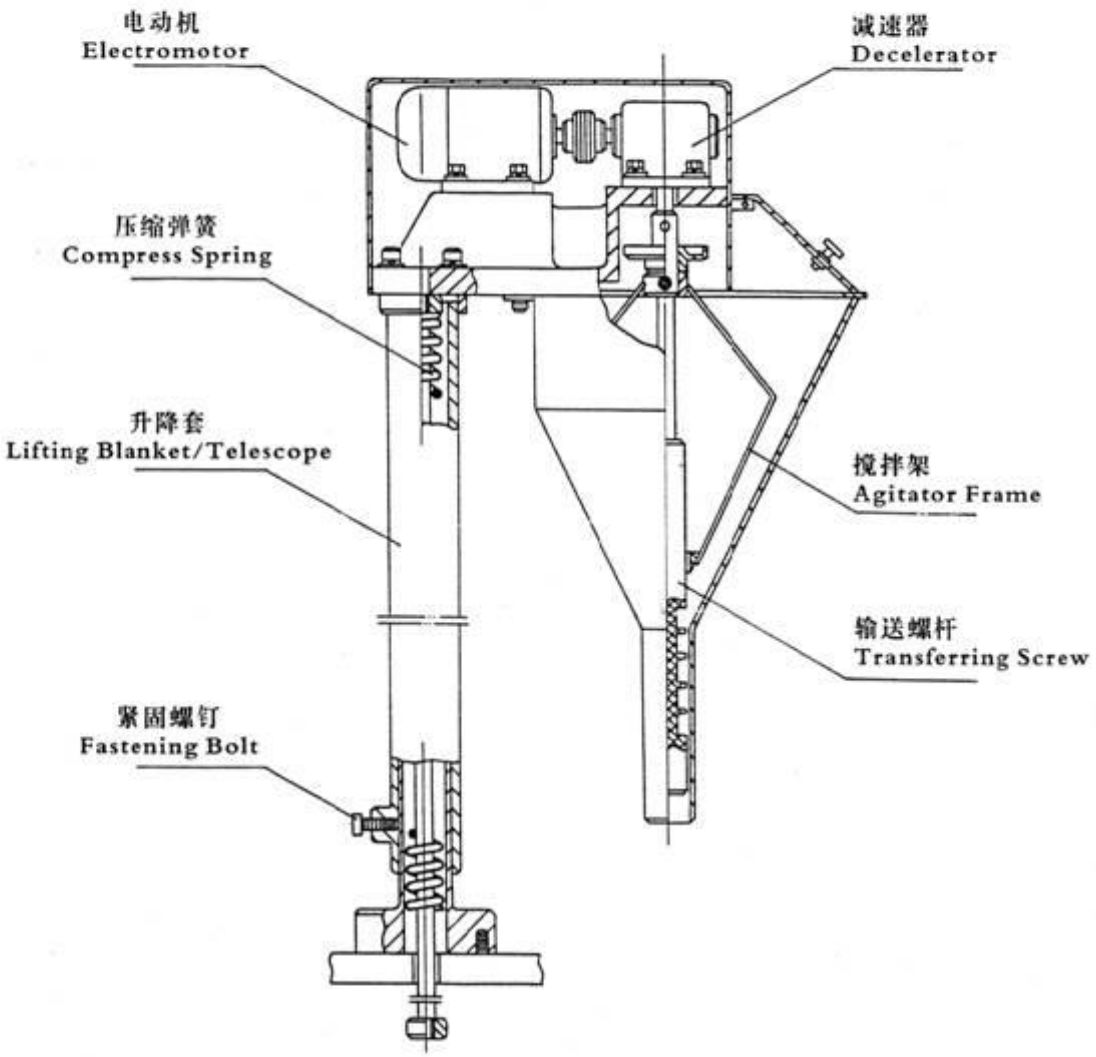


图14 粉输送机构
Figure 14 Mechanism For Transferring Powder

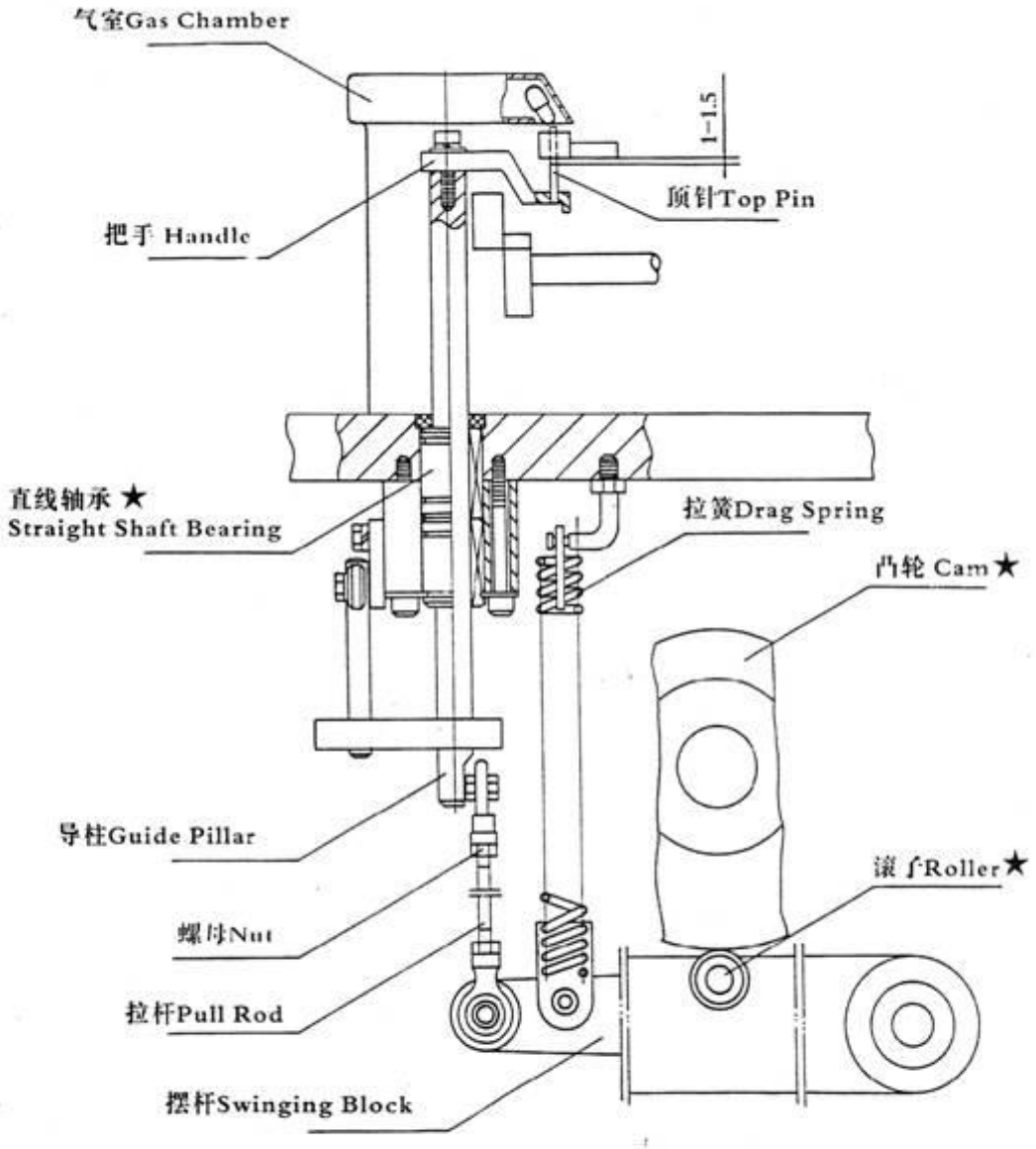


图15 剔囊机构
Figure15 Capsule Trimming Mechanism

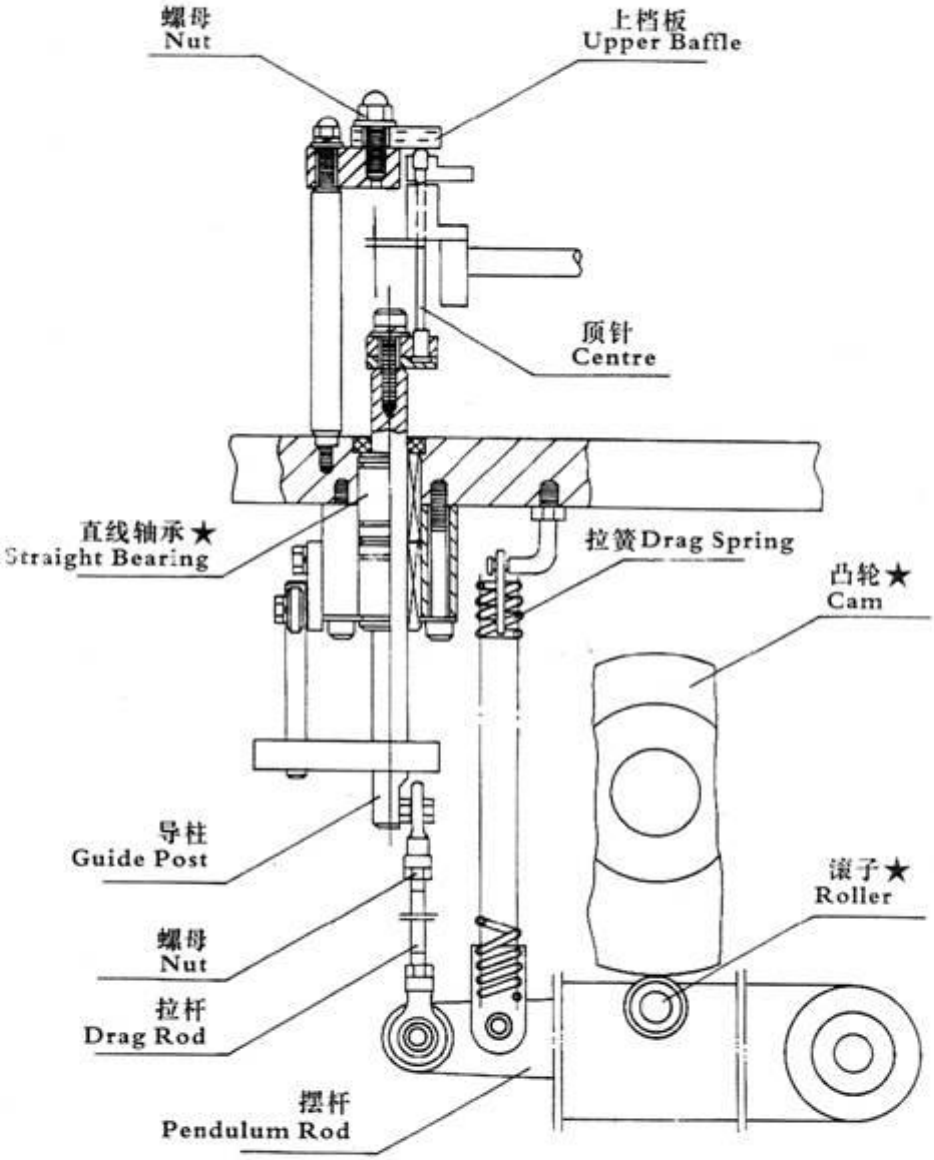


图16 锁紧机构
Figure16 Locked Mechanism

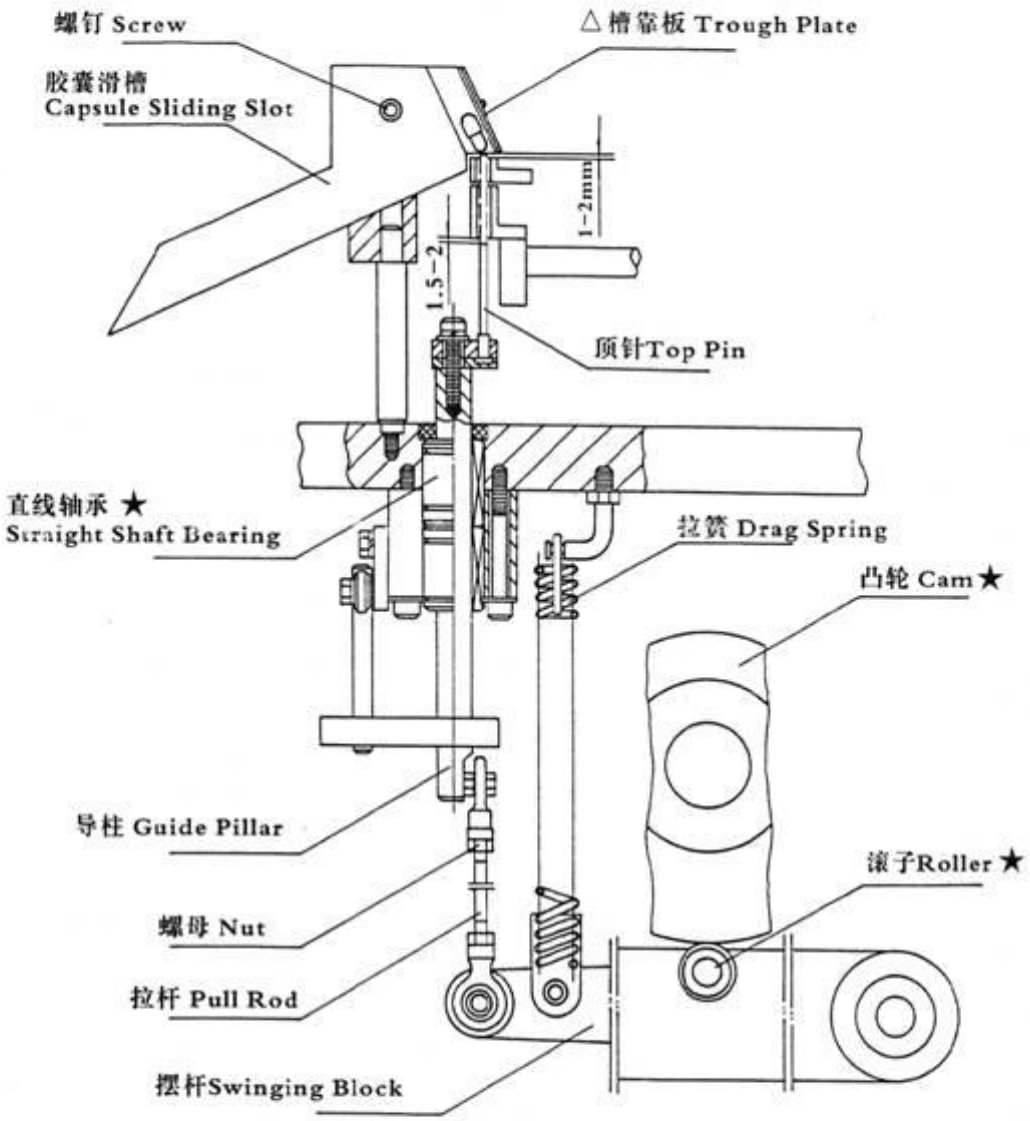


图17 出囊机构

Figure17 Capsule Exit Mechanism

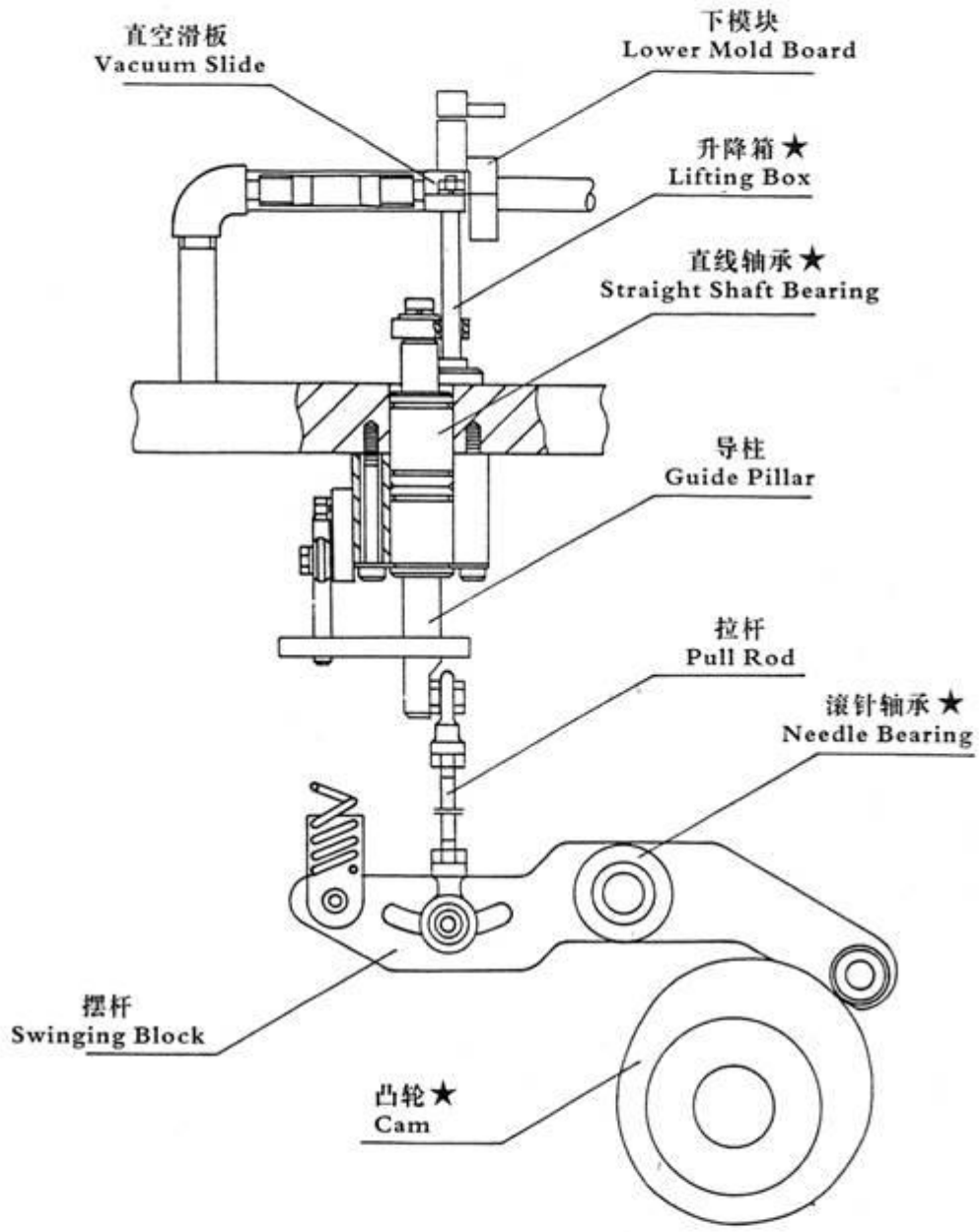


图18 真空连接及传动机构
Figure18 Vacuum Connection And Transmission Mechanism

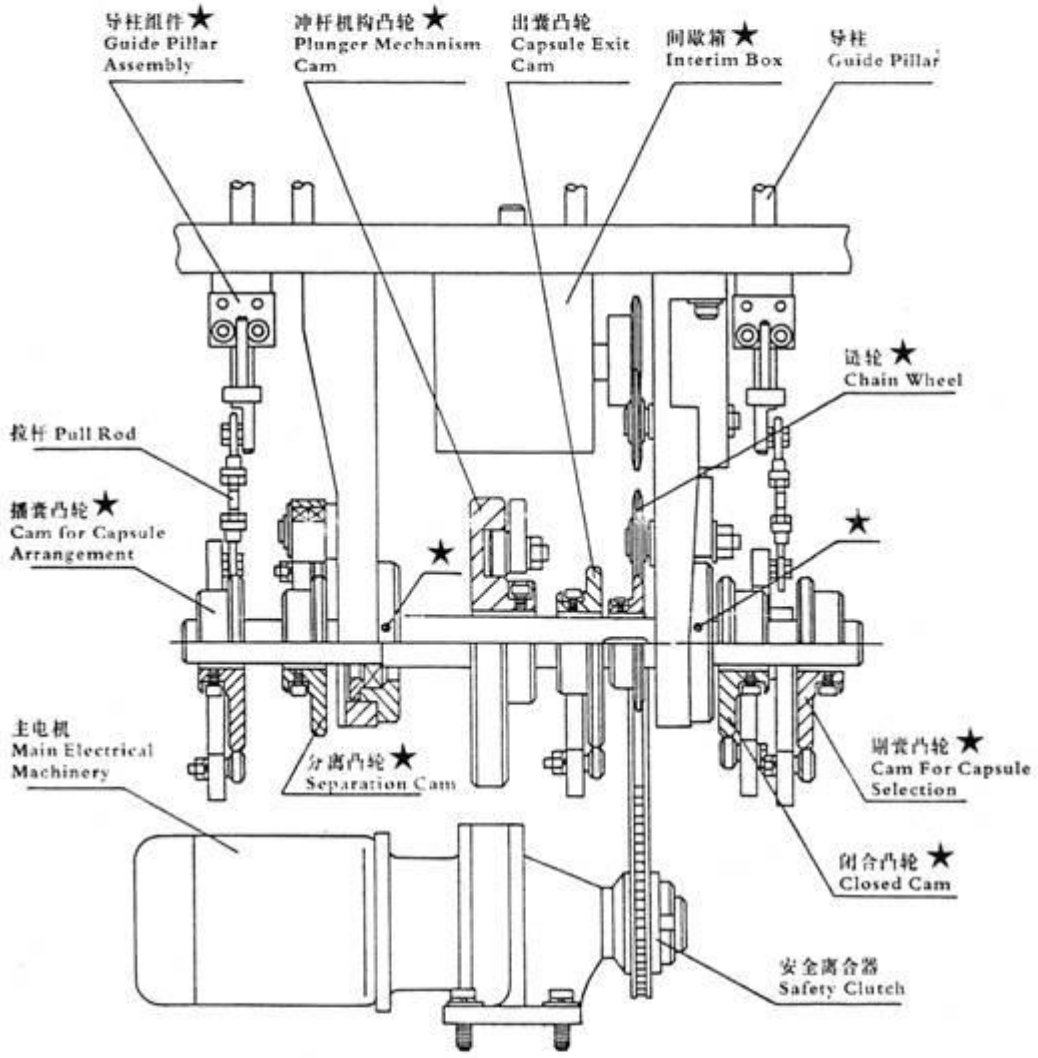


图19 传动机构
Figure19 Transmission Mechanism

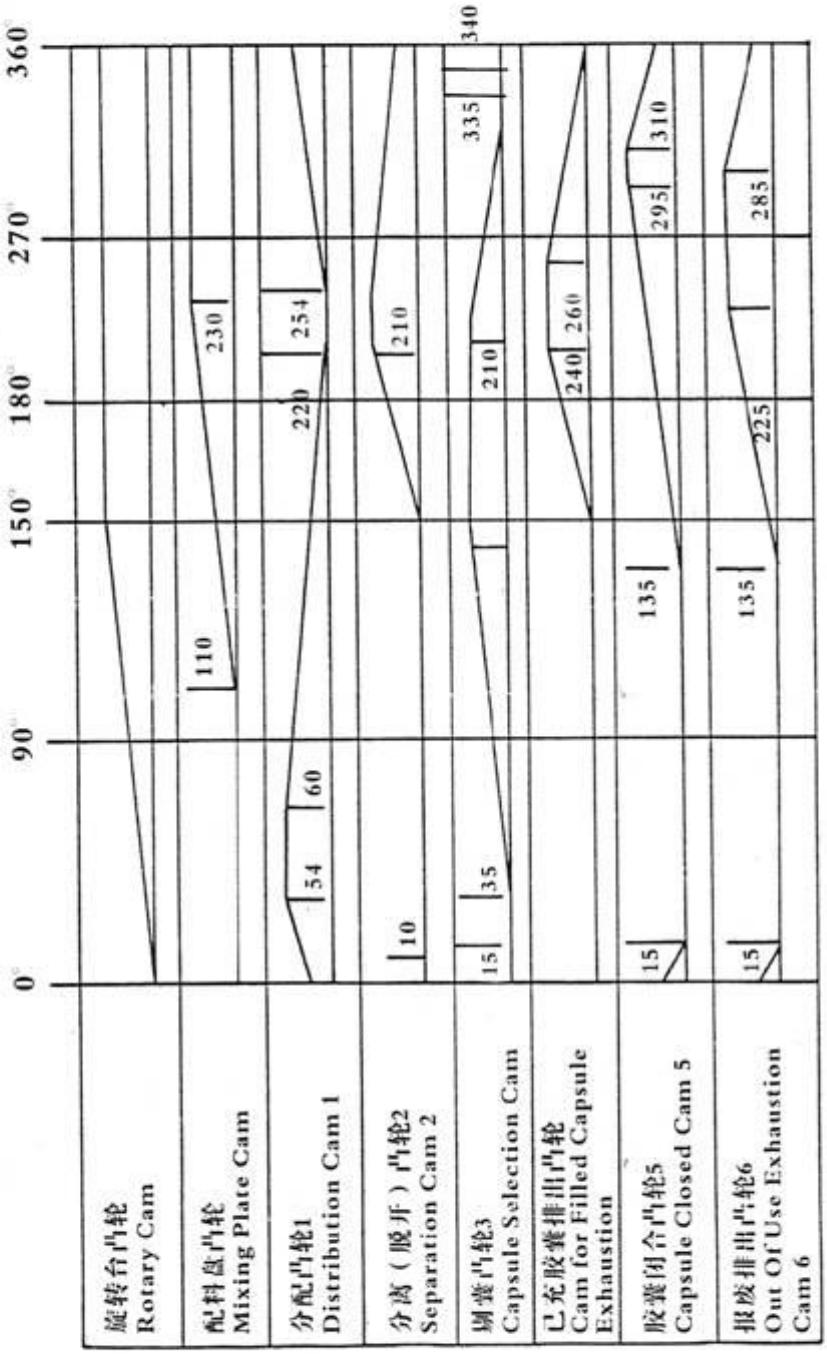


图20 凸轮运转顺序

Figure20 Cam Operating Gradation

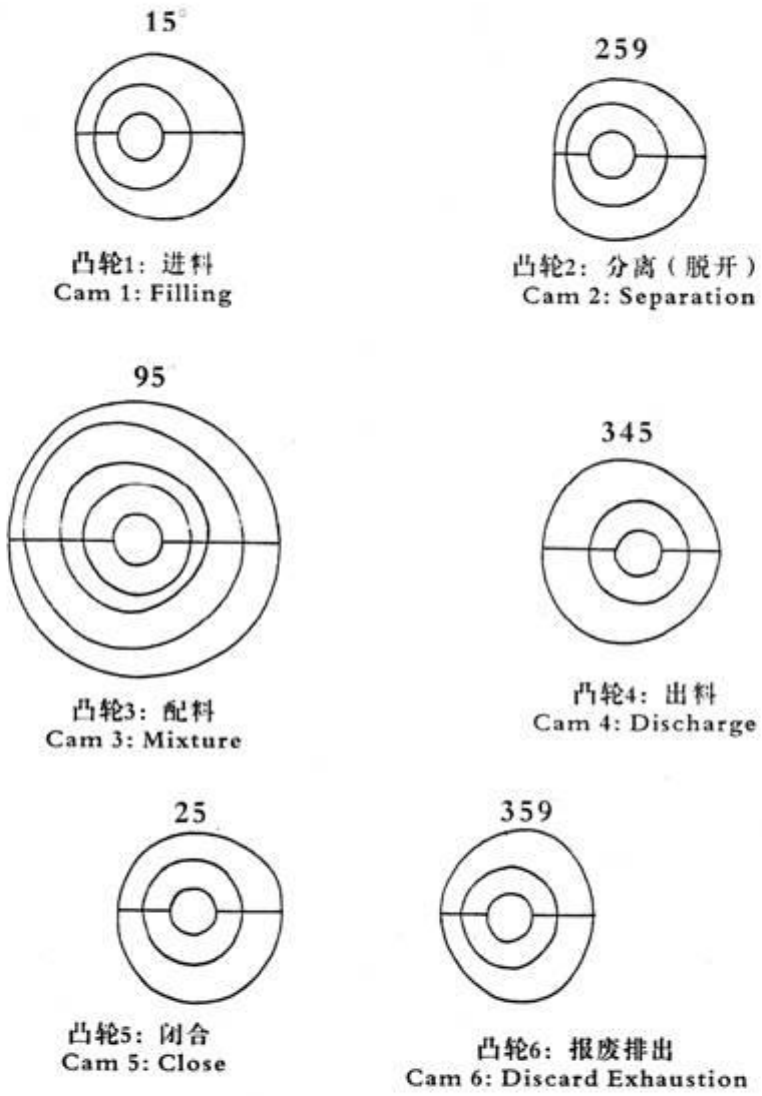


图21 凸轮
Figure21 Cam

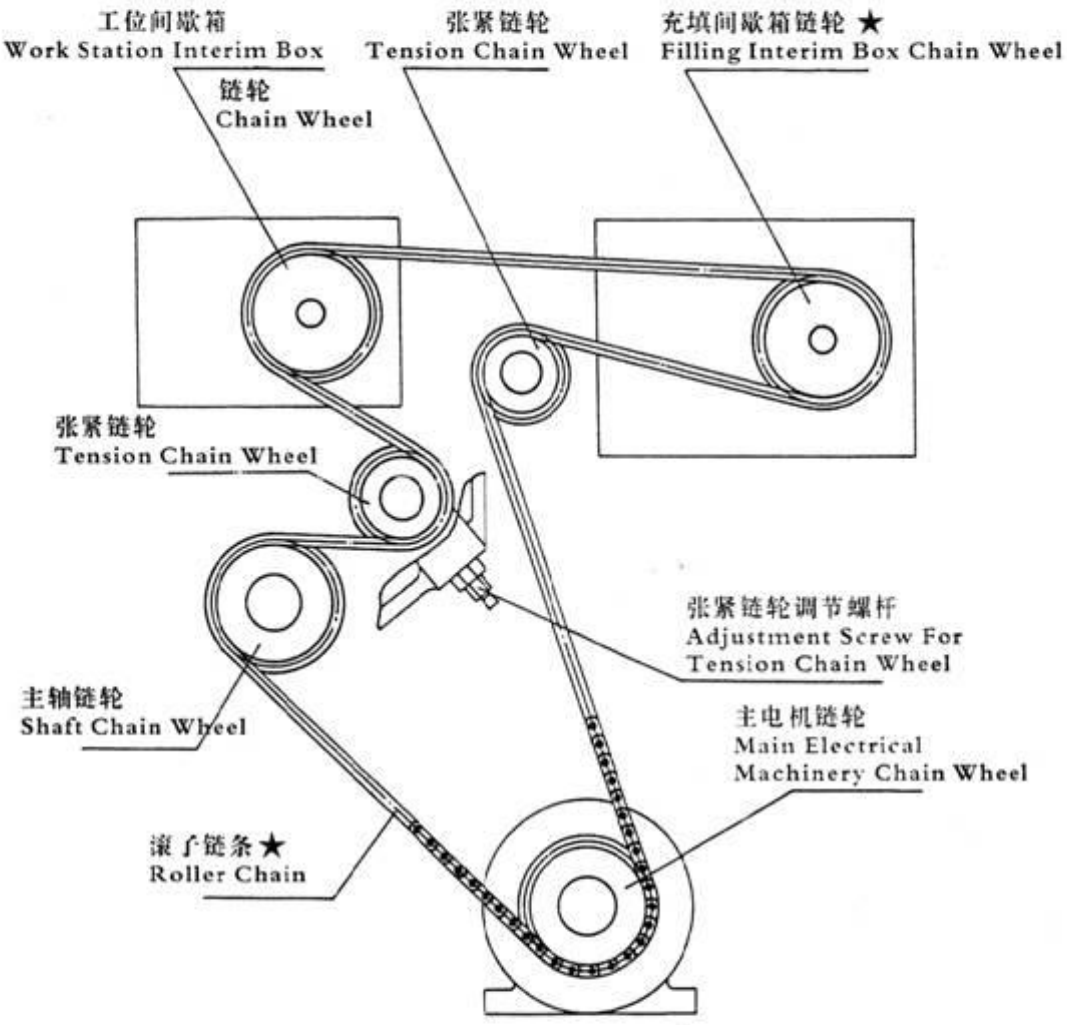


图22 传动链
Figure22 Transmission Chain

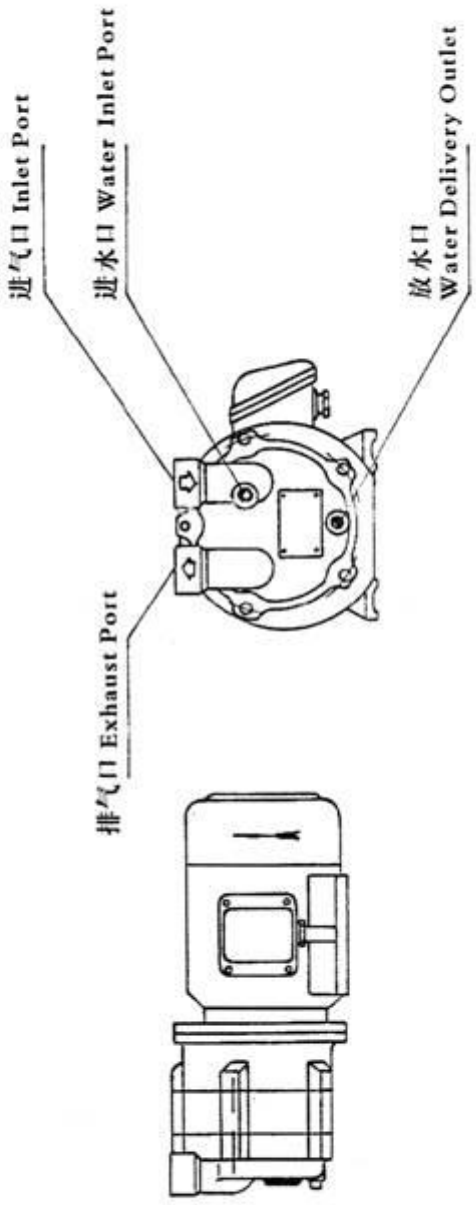


图23 SZ型单级水环真空泵

Figure23 SZ Type Single-Stage Water Vacuum Pump

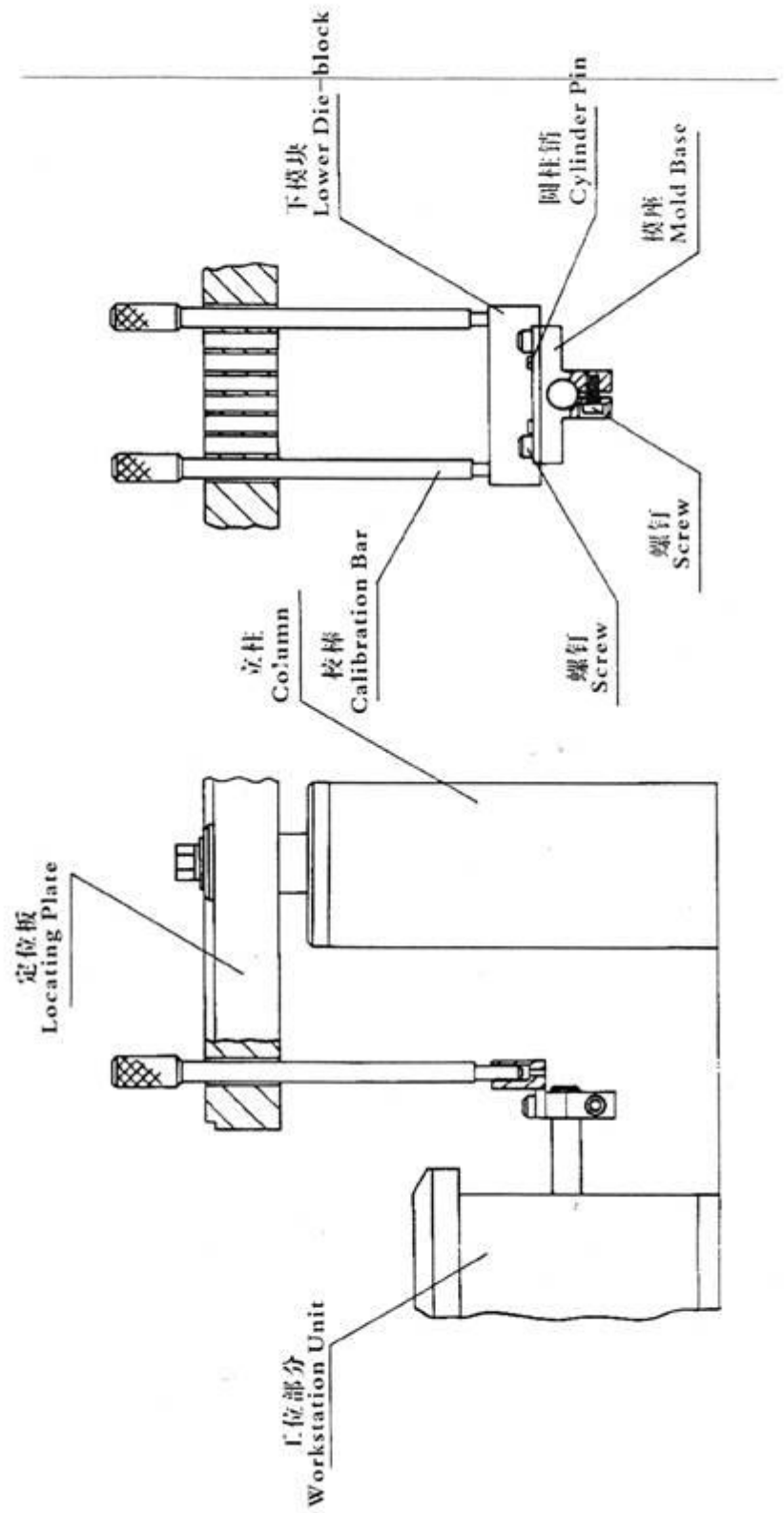


图24 下模校准视图

Figure 24 Lower Mold Calibration View

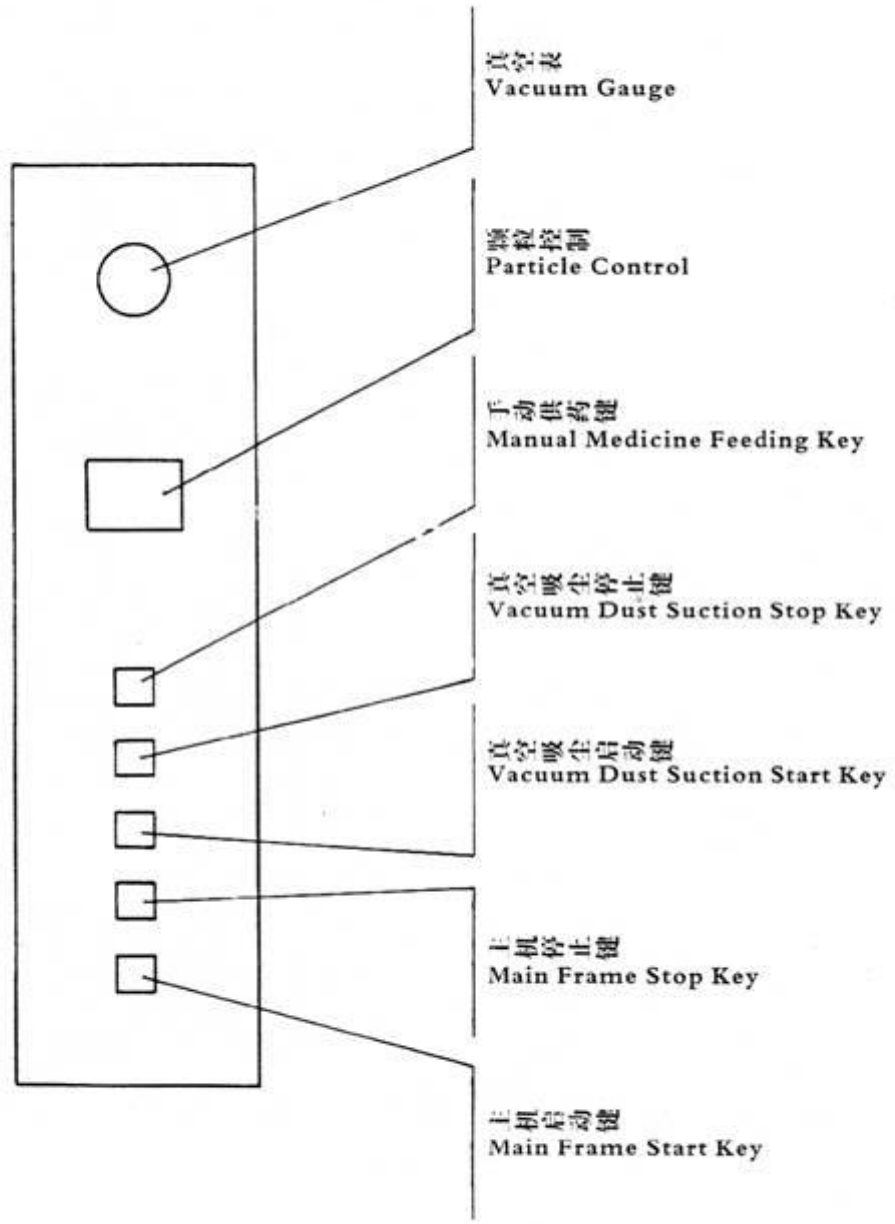


图25 面板操作
Figure 25 Panel Operation

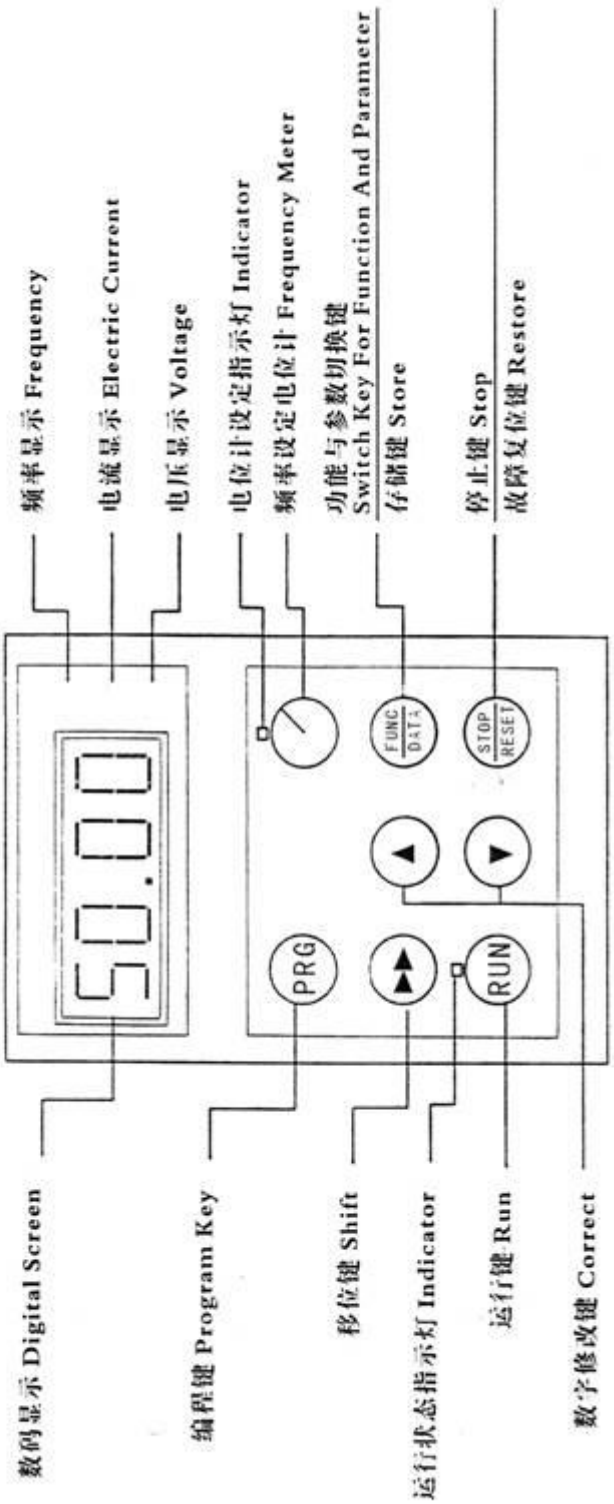
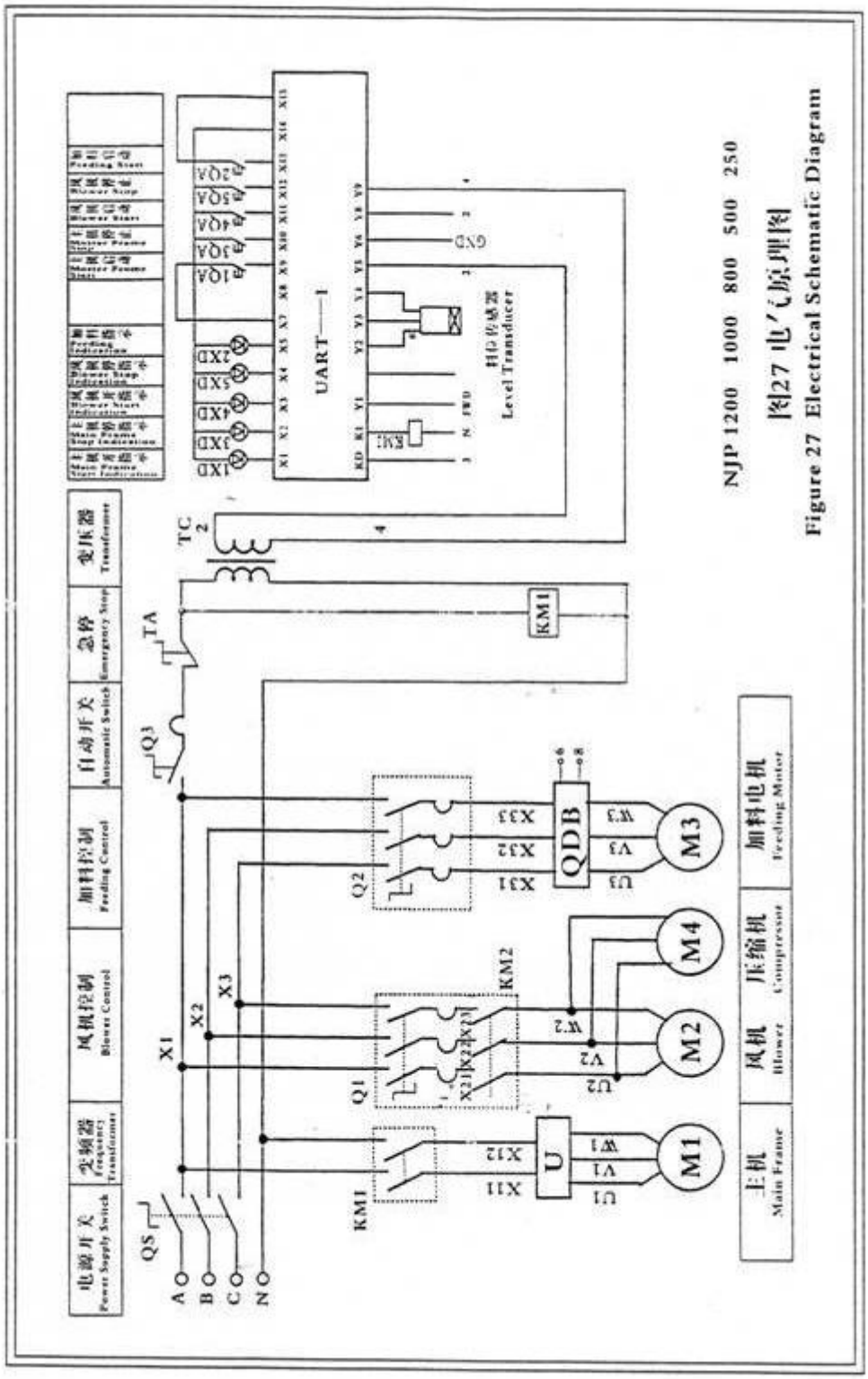


图26 操作面板示意图

Figure 26 Schematic For Operation Panel


NJP 1200 1000 800 500 250
图27 电气原理图
Figure 27 Electrical Schematic Diagram
UART—1
Level Transducer
TC
TA
KM1
KM2
Q1
Q2
Q3
QS
QDB
U
M1
M2
M3
M4
A
B
C
N
电源开关 Power Supply Switch
变频器 Frequency Transformer
风机控制 Blower Control
加料控制 Feeding Control
自动开关 Automatic Switch
急停 Emergency Stop
变压器 Transformer
主机 Main Frame
风机 Blower
压缩机 Compressor
加料电机 Feeding Motor