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OPERATION MANUAL FOR SPIRAL MIXER

MODEL SM-120a

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1. BRIEF INTRODUCTION AND SPECIFICATION

The SM-200a and SM-120a are spiral mixer with removable bowl suitable for big production.
The drawing below show: parts of the machine for your reference:

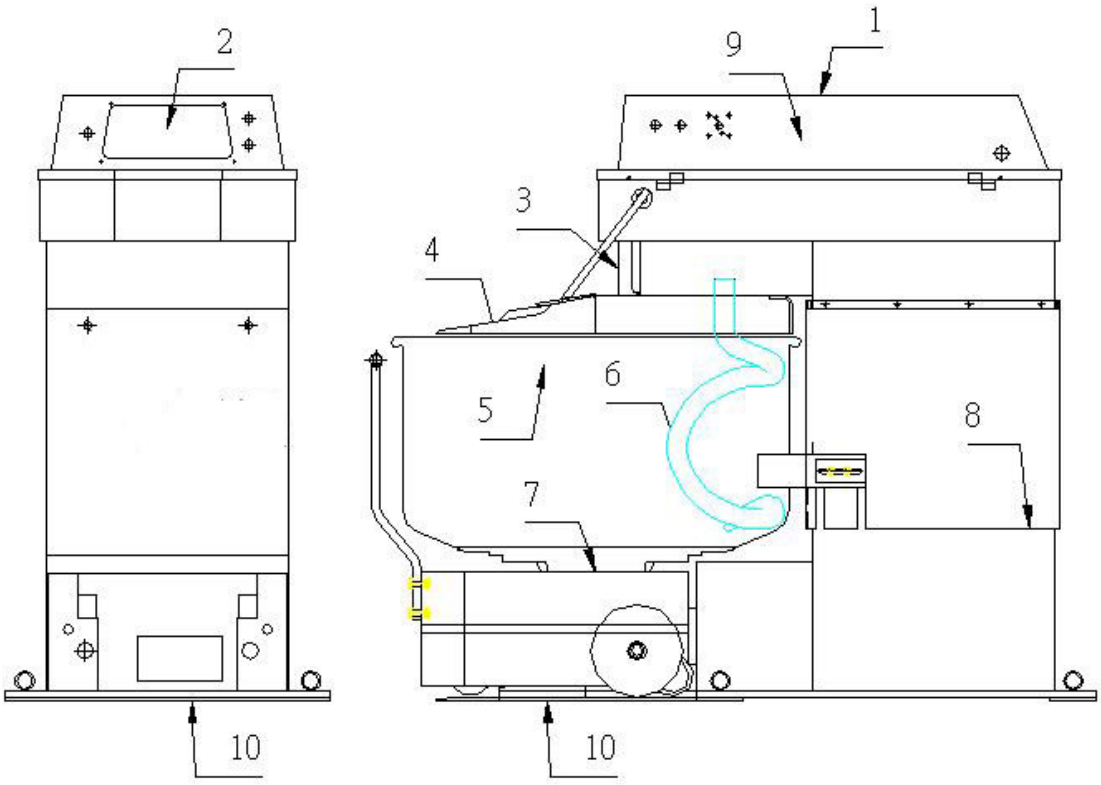

Figure 1

No.	item	No.	Item
1	Top cover	6	Hook
2	Operation panel	7	Trolley
3	Center Pillar	8	Frame
4	Safety guard	9	Electric box
5	Bowl	10	Base plate

Table 1

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SPECIFICATION:

Model	SM-120a	SM-120a-S	SM-200a	SM-200a-S
Flour Capacity	75	75	125	125
Dough Capacity	120	120	200	200
Power (Kw) For Spiral For Bowl	9 0.75	9 0.75	12 1.5	12 1.5
Net Weight(Kg)	1300	1300	1350	1350
Bowl（mm） (diameter×depth)	Φ775×419	Φ775×419	Φ960×517	Φ960×517
Dimension（mm） (Length×Width×Height)	1600×780×1230	1590×1010×1300	1720×980×1430	1780×1020×1330

Table 2

Remark: SM-120a & SM120a-S，SM-200a & SM-200a-S share the same transportation, installation, operation and components of machine. The difference between the two is: SM-120a&SM-200a have their operation panel and electric box in their top position while SM120a-S&SM-200a-S have their operation panel and electric box in a separate stand for easy approach.

INSTRUCTION ON MODEL

MODEL	INSTRUCTION ON MODEL
SM-120a/ SM-200a	Friction wheel drive, operation panel on its top
SM-120a-S/ SM-200a-S	Friction wheel drive, operation panel on separate stand

Table 3

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2. TRANSPORTATION

WOODEN PACKAGE WEIGHT: 1470Kg

1) **Check wooden case to see if any damage before unpack the case.**
2) **After unpacking of wooden case top and sides, use strong nylon rope to tie to the four rings at bottom leveling screws as shown in Figure 2.Then use crane to lift the machine from bottom wooden board and move to the installation position. Pay attention that the head will not tilt and fall down to prevent oil leakage. The machine should be placed slowly and steadily.(see Figure 2)**

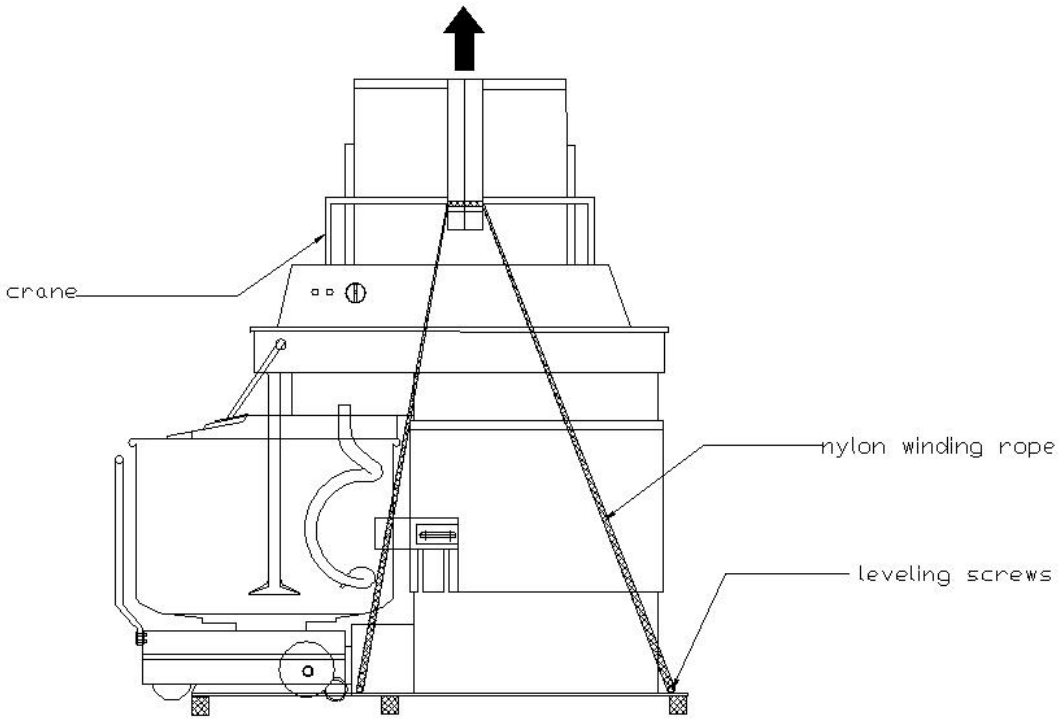

Figure 2

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3. INSTALLATION

1) **Select a horizontal and plain floor to install the machine.**
2) **Make sure the bottom plate of the machine is parallel with floor, if not, you can adjust it by leveling screws.**
3) **Put plate washers to support the bottom plate of the machine.**
4) **Take our leveling screws. At its position, put washer bolt to fix the machine firmly to the ground as shown in Figure 3.**

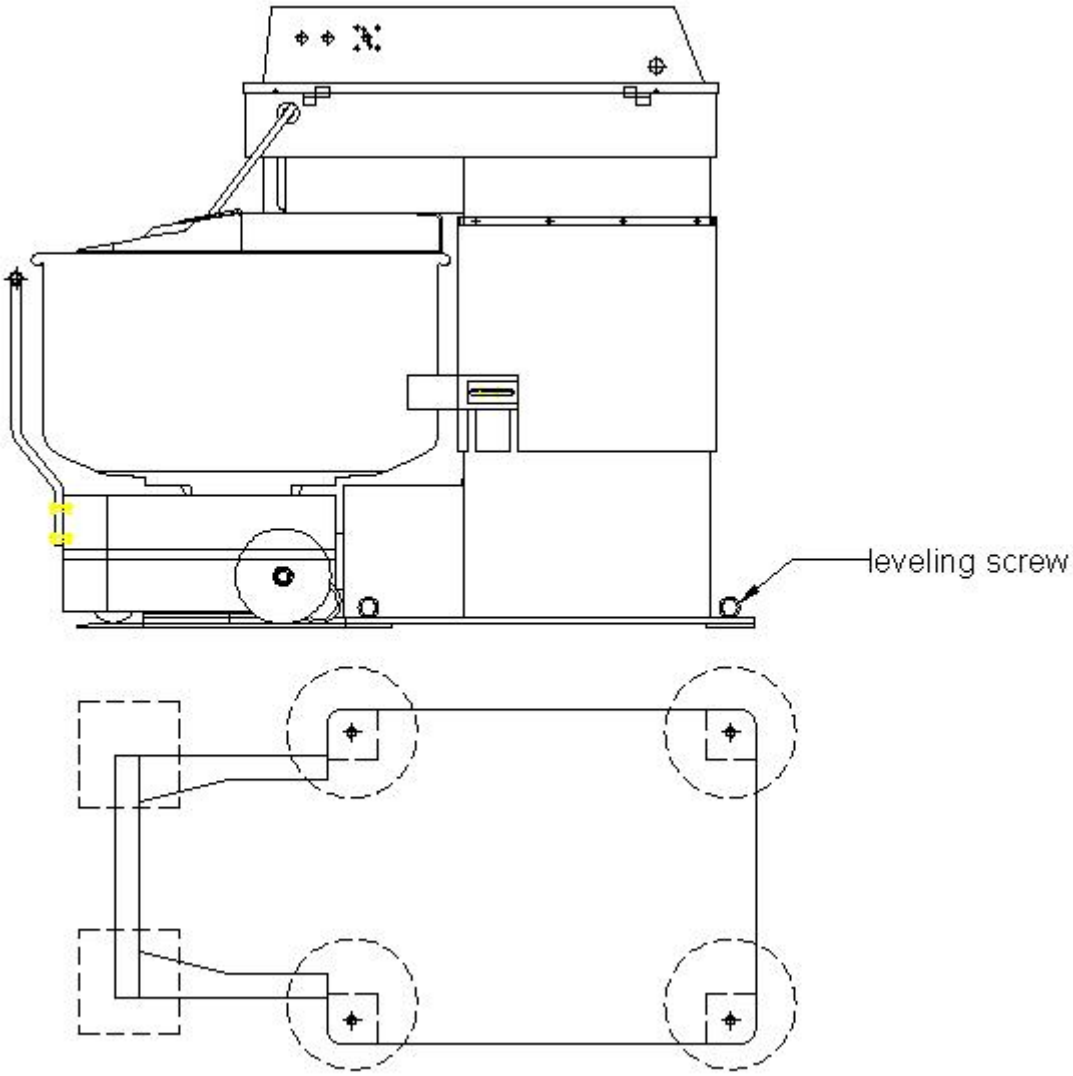

Figure 3

5) **Connect electric power cables to the machine with a circuit breaker which about 2m high.**
6) **After electric connection, check the rotation of bowl and hook. Both bowl and hook should rotate clockwise from top view. If wrong, exchange two power cables and test again until it is right.**

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7) **Push “UP” button. The head of the machine will move up to the top position and stop automatically. Loose the adjustment screws of the bowl position.(see Figure 5)**

Figure 4

8) **Pull the bowl out of the machine and push the bowl into the machine. Repeat as above until the bowl can be pushed in and pulled out easily. Tighten the adjustment screws of the bowl guide rod as shown in Figure 5.Then try to pull out the bowl and push it in again to make sure the bowl can go in and out smoothly.**

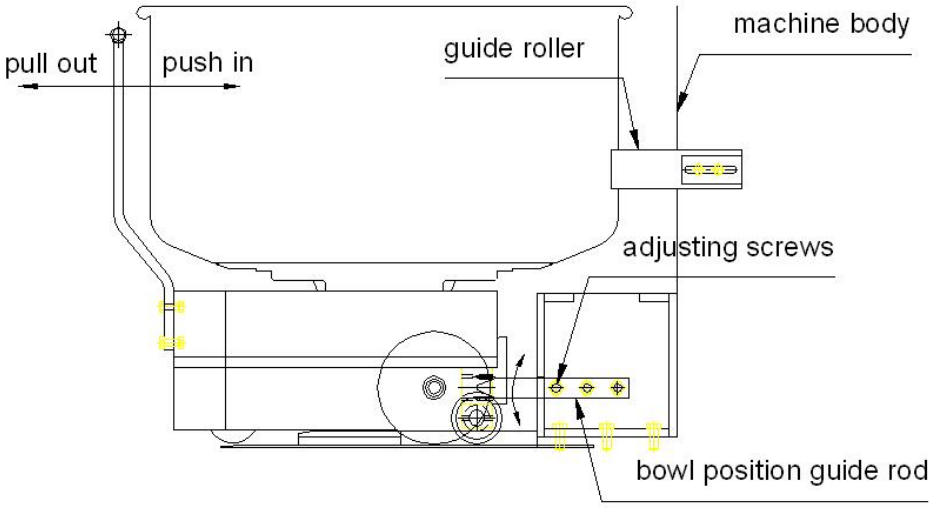

Figure 5

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4. SAFETY INSTRUCTIONS

1) **Do not overload the mixer. If the dough is loaded with less water content than 58%, please reduce flour and dough capacity.**
2) **Please read this operation manual carefully before operation or maintenance. The nameplate should be taken attention as well.**
3) **All the safety cover and side panel should be closed during operation.**
4) **Make sure the trolley is located well before operation, and the indication lamp will on if the trolley is well located. Move the bowl ahead and rotate the bowl slightly to make sure bowl drive wheel is in good contact with bowl.**
5) **Pay attention that power cables of head is not stucked.**
6) **Make sure when open the safety guard, the machine will stop.**
7) **All the operators should comply with safety rules on clothing and wearing.**
8) **Operator himself should not lean on the machine.**
9) **Maintenance should be carried on by professional technicians.**
10) **Turn power off before maintenance.**
11) **The machine should have good earthing.**
12) **Turn off the power after daily use.**

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5. OPERATION PANEL

Figure 6

DESCRIPTION

5.1.1 TIMERS

On top of the operation panel, there are two timers:

Timer Ⅰ is for slow speed.

Timer Ⅱ is for fast speed.

Each Timers has there digits as below

A and B is minutes.

C is 10 seconds

0.1 is 10 seconds

0.2 is 20 seconds

0.3 is 30 seconds

0.4 is 40 seconds

0.5 is 50 seconds

You use **function key to set the time on both timers.**

Maximum set time is 20 minutes. After 20 minutes the timer starts from 0 minute again Press **key to reduce time.**

When the spiral mixer is switched ON, timers will show the set time. When the timer starts to work, it will count down until it comes to 0.

During AUTOMATIC operation, when the safety cover is raised, the timer will stop at the current position. When the spiral mixer continues to work, the timer continues from the stopped position to finish the remaining time.

During MANUAL operation, the timer will not work.

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When the key is pressed, timers will return to the set time.

5.1.2 INDICATION LAMPS

To show the following operation condition of the spiral mixer.

a) AUTO/MANUAL condition: When AUTO lamp lights up, it is in AUTO operation.

When MANUAL lamp lights up, it is in MANUAL operation.

b) Bowl direction condition: When lamp lights up, the bowl is in FORWORD direction, when lamp lights up, the bowl is in REVERSE direction.

c) Speed Condition: When "Ⅰ" lamp lights up, the bowl is in slow speed condition. When "Ⅱ"lamp lights up, it is in fast speed condition.

d) INCH lamp shows inching condition.

When neither INCH nor ON lamp light up, it is in STOP condition.

e) ON lamp lights up showing ON condition.

f) STOP lamp lights up only when the safety cover is raised.

g) O••L.(Over-LOAD):This lamp lights up when the overload relay is on. Please remove the fault(voltage drop, mixer overloaded or cable connection becomes loose) so that this lamp will turn off.

5.1.3 FUNCTION KEYS

AUTO/MANUAL selection key

Speed selection key

Bowl direction (Forward -0- Reverse) selection key.

When it is set in "F", the bowl should run in the same direction as the arrow mark "→"on the bowl.

: Start key

: Stop key

: Inching key.

Only the bowl will run while you press this key.

5.2 AUTO OPERTAION

A) Press key below "Ⅰ" timer to set the desired time for slow

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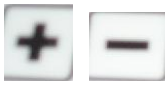
speed.

B) Press  **key below "Ⅱ" timer to set the desired time for fast speed.**

C) Press **key until the AUTO lamp lights up.**

D) Press **key until** **lamp lights up.**

E) Press **key to start the machine.**

After the above procedure, the machine starts operation. It will run at slow speed until "Ⅰ" timer run off to "0". Then the machine will start running at fast speed until sets on "Ⅱ" timer runs off. The machine will stop automatically thereafter.

During AUTO operation, the machine stops when you lift the safety cover. The timer also stops right at the time it was. The timer will only resume its work and continue running after you push ON key.

When pressing OFF key, the timer will jump back to the time it was originally set.

5.3 MANUAL OPERATION

A. Press **key until MANU lamp lights up.**

B. Press **and** **keys to select the desired speed and bowl direction.**

C. Press **key to start the machine.**

D. Press **key when you want to stop the operation.**

The timer will stop functioning under manual operation.

The bowl can not be reversed under fast speed.

The mixer will always start at slow speed. When mixer is running at slow speed, you can then press **to let mixer run at fast speed.**

Remark: the bowl can't move in reverse direction when the machine is in fast speed.

5.4 OPERATION METHODS

1) **Pull out the bowl.**
2) **Put all ingredients into the bowl.**
3) **Push the bowl into the machine. Press "DOWN" to move the head down to**

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the mixing position.

4) **Set the mixing time, and start the machine.**
5) **The mixer stops automatically when it finishes mixing cycle. Press “UP” to move the head up to the top position.**
6) **Pull out the bowl.**
7) **Push another bowl into the machine.**

Remark:

1) Move the head of the machine up and down at least once a time before daily use.

2) Do not operate the machine when the bowl is not located well.

3) Do not move the bowl any further when the head moves up and down.

4) Bowl should be pushed into the mixer steadily, neither too slow nor too fast. If you find it is difficult to push the bowl, then move the bowl backward. Adjust the track, and push it into again.

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6. HYDRAULIC SYSTEM

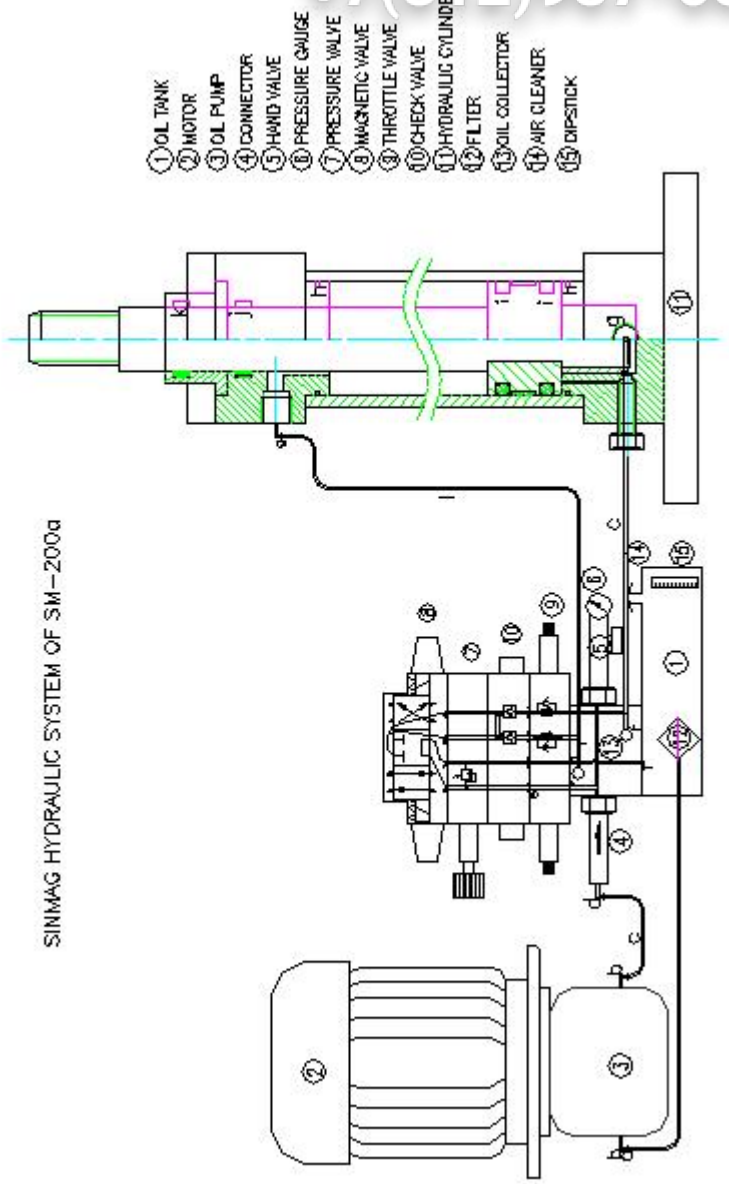

Figure 7 hydraulic system

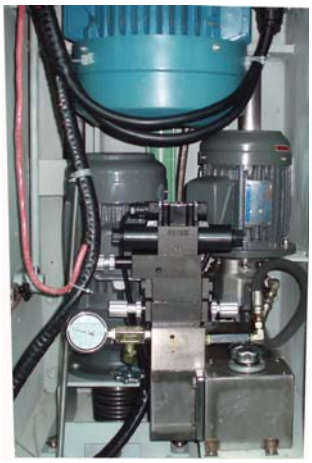

Figure 8 hydraulic system

1. Start the machine and hydraulic system

Turn on the power, press "UP" or "DOWN" button, the motor will run and the hydraulic system start to work.

2. Head up

Press "UP" button, The cylinder move upward to bring down mixer head to its top position.

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3. Head down

Press "DOWN" button. The cylinder move downward to bring down mixer head to mixing position.

4. How can I do if the head move neither up nor down?

a) Check the oil whether it is enough in oil tank.

b) Open the throttle valve. Press "DOWN" button to see if there is any pressure displayed in pressure gauge.

c) Check there is any malfunction on magnetic valve.

d) Check the motor and motor pump to see there is any damage or disorder.

e) If above problems don't exist, turn off the power, tear down the pressure valve to clean it (use diesel oil or gasoline)

5. How to deal with it if the head moves either too fast or too slowly?

Open oil gauge so that oil gauge shows oil pressure. One person presses "UP" button to make the mixer head move upward, then presses "DOWN" button, so that the mixer head moves downward. Then Another person opens, adjusts throttle valve until the pressure gauge showed about 40Kg/cm^2 .

Figure 9 pressure display 40 Kg/cm^2

6. Why the frame of the machine shakes when mixing? How to do with it?

The reason is the pressure goes down in cylinder.

①Check if there is any oil leakage in cylinder.

②Check the connector of oil tube to see if any leakage.

③Check the gap between every valve to see if any leakage.

④Check the check valve.

⑤Check the oil O ring of the cylinder.

Solution:

①Replace O ring of the cylinder.

②Replace the oil tube.

③Replace O ring of the valves.

④Open throttle valve. One person presses "UP" button to make the mixer head move upward, then presses "DOWN" button, so that the mixer head moves downward. Another person opens, adjusts throttle valve until the

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pressure gauge showed 200 Kg/cm^2 above, and keep it for half an hour, if the pressure does not go down below 170 Kg/cm^2 within half an hour, it is indicated that the check valve work well, if the pressure go down below 170 Kg/cm^2 within half an hour, it is indicated that the check valve work with problems, we suggest you should fix or change it.

Figure 10 pressure display 200 Kg/cm^2

7. Pressure value for your reference when operation

MOVEMENT	PRESSURE DISPLAY（Kg/cm^2）
UP	0
TOP	0
DOWN	40
BOTTOM	200

Table 3 movement and pressure display

8. After the pressure being adjusted well, one person presses "UP" button to make the mixer head move upward. Another person closes the throttle valve until the pressure gauge showed 0Kg/cm^2.

Figure 11 pressure display 0 Kg/cm^2

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7. CLEANING AND MAINTENANCE

1) Use the wet cloth to clean the machine after daily use, do not wash it with water directly.
2) Clean the splashed flour thoroughly which may lie in the top of the clamping block, safety cover, etc.
3) Clear the dust in the top cover of the spiral mixer very often.
4) Make sure to turn off the power after daily use.
5) Check all the components to see whether it is in good status termly.
6) Check whether the convection belts are in good tension monthly.

8. TROUBLESHOOTING

Item	Possible reason	Method
1.Bowl and beater rotate in reverse direction	Check whether the any of the two cables are in reverse connection	exchange any of the two cables
2.Machine shakes when operation	a) The ground is not horizontal and plain enough. b) Foot pad is unstable.	a) Select a horizontal and plain ground to install it. b) Readjust the foot pad to enable the machine's stability.
3.The bowl still rotates after the safety cover has been opened	a) The microswitch is wrong. b) The adjust wheel go with the microswitch is wrong	a) Change the microswitch. b) Tighten the adjust wheel or change it if damaged.
4.Guide roller can't work	a) The bearing of the guide roller is damaged. b) The gap is too long to service the bowl	a) Change the microswitch. b) Readjust the gap between guide roller and bowl to satisfy the bowl.
5. Main shaft can not work	a) Check the power b) Check the main switch c) Check the motor d) Check the magnetic valve e) Check the over-load protection f) Check any breakage about "ON/OFF" button. g) Check the trolley whether well located	Should carried on professional electricians.

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8. Main shaft can not stop	**a) Check if there any damage on emergency button.** **b) Check if there is short circuit on contactor.**	**Should carried on professional electricians**
7. Main shaft can not work continuously	**a) Check if any damage on contactor** **b) Check if any abnormal on motor.**	**Should carried on professional electricians**
8. Electric leakage	**a) Check if any damage on cables** **b) Check if any moisture in electrical box** **c) Check if any malfunction on transformer**	**Should carried on professional electricians**
9. Main shaft will stop unexpectedly	**f) Check if any trip happened or set value of current is changed** **g) Check if any abnormal on motor.**	
10. Strange noise made by motor	**a) Check if the water in dough is not enough**	

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9. ELECTRIC DIAGRAM

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10. PARTS LIST