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**MTW** European Technology Trapezium Mill  
型欧式梯形磨粉机

使用说明书  
Operating Manual

 **郑州通用矿山机械有限公司**  
ZHENGZHOU GENERAL MINING MACHINERY CO.,LTD

地址：郑州市高新区西四环与科学大道交叉口向南600米路西  
Address: West Side, 600 Meters Toward South, Intersection of Scientific Avenue  
and West Ring 4 Road, High-Tech Zone, Zhengzhou City  
国内销售热线(Domestic Sales Hotline): 0371-67828877  
国际销售热线(International Sales Hotline): 0086-371-68612899  
传真(Fax): 0086-371-67821388 网址(Web): <http://www.zztyjq.com>



# MTW型欧式梯形磨粉机

## MTW European Technology Trapezium Mill



### 一、工作原理、整机结构特征：

MTW型欧式梯形磨粉机整机结构是由主机、选粉机、管道装置、离心引风机、旋风集粉器、除尘器组成，其附属设备由颚式破碎机、畚斗提升机、储料斗、电磁振动给料机、电控柜等组成。

工作原理：

磨粉机整机工作过程(粉磨物料过程)：大块状物料经颚式破碎机破碎到所需粒度后，由提升机将物料送至储料斗，再经振动给料机将物料均匀定量连续地送入主机磨室内进行研磨，粉磨后的粉子被风机气流带走，经选粉机进行分级，符合细度的粉子随气流经管道进入旋风集粉器内，进行分离收集，再经出粉管排出即为成品粉子。气流再由旋风集粉器上端回风管吸入引风机。本机整个气流系统是密闭循环的，并且是在负压状态下循环流动的。

在磨室内因被磨物料中有一定的含水量，研磨时产生热量导致磨室内气体蒸发膨胀改变了气流量，以及整机各管道接合处密封不严，让外界气体被吸入，使循环气流风量增加，为此通过调整风机和主机间的排气管来达到气流的平衡，并将多余气体导入布袋除尘器内，把余气带去的微粉收集下来，余气被净化后排出。

主机工作过程：电动机通过一副三角带轮带动横向传动轴转动，横向传动轴再通过另一端的锥齿轮带动主机主轴，主轴的上端连接着磨辊吊架，磨辊装置通过横担轴吊架在磨辊吊架上并形成摆动支点，其不仅围绕中心轴回转，同时在离心力的作用下磨辊沿着磨环内圆滚动，磨辊本身因摩擦作用而自转。磨辊吊架下端装有铲刀架，铲刀架的下法兰上装有倾斜的铲刀，铲刀的前端接近磨室衬板，后端位于磨辊与磨环形成的楔形间隙内，铲刀与磨辊同转过程中把物料铲抛喂入磨辊磨环之间而被挤压、碾碎。从磨环底部进入磨腔的气流将小颗粒粉料带入选粉机，由此而达到制粉目的。

选粉机工作过程：调速电机带动转盘上的叶片旋转，所形成的涡流效应对粉子起分级作用。叶片转速的快慢是按成品粉子粒

度大小进行调节。当如要获得较细粒度的粉子时，就必须提高叶片的转速，使不合要求的粉子被抛向下方，粗粉子因自身重力作用落入磨室进行重磨，合格的成品粉子通过叶片随气流吸入到旋风集粉器内，气流与粉子被分离后，粉子被收集。旋风集粉器对磨粉机的性能起到很重要的作用。带粉气流进入集粉器时在集粉器内形成向下运动的旋转气流。旋转粒子在离心力的作用下，颗粒物甩向筒壁。颗粒一旦碰到筒壁即被捕集并沿着筒壁滑向桶底。向下运动的气体在锥体的作用下加速旋转并被向上反射从回气管排出进入风机。集粉器的下端装有锁粉器，从集粉器下端掉落的粉子通过锁粉器排出。由于在集粉器锥底形成的向上旋转的气流核心呈负压状态，所以对集粉器的下端密封要求很高，不允许有漏气现象。一旦漏气会使已经被捕集的粉子被气体重新吹起带走，直接影响到整机的产量。因此集粉器的下端装有两个锁粉器，其作用分别是打开或关闭，从而能够在卸料时保证外界空气不被吸入集粉器。

### 1. Structural Characteristic and Operational Principle

A set of MTW European technology trapezium mill consists of mainframe, separator, piping device, blower, cyclone collector and bag filter, it's accessory equipments include jaw crusher, bucket elevator, hopper, electric magnetic vibrating feeder, electric cabinet, etc.

Working principle: Working process of the overall unit(material's grinding process): raw material is crushed by the jaw crusher to the size specified, then the crushed stuff is elevated into the hopper by the bucket elevator, and through the vibrating feeder it is evenly and continuously carried into the grinding chamber for powder-processing. After this, the grind stuff is carried by the airflow from the blower into the separator for screening. The qualified powder is blown into the cyclone collector and poured out through the output-powder valve as the final products. The airflow is drawn into the blower by the return air pipe which is situated at the upper edge of the cyclone collector. The airflow system is closely sealed up and circulated under condition of negative pressure.

Because the material contains some moisture, and the heat generated during the grinding process makes the moisture evaporate, what's more, the pipeline joints are not airtight which cause the external air being sucked in, all these will increase air-current in circulation. The balance of the air current in circulation can be realized by adjusting the vent pipe between the blower and the mainframe. And the powder carried by the residual air will be collected by the dust filter, at the same time, the residual air is charged into the atmosphere after purification.

Working process of the mainframe: The motor drives the horizontal drive shaft rotating through a V-belt. And the horizontal drive shaft drives the main shaft rotating via the cone gear at the other hand. At the up end of the main shaft there is connected the suspension rack on which the roller assembly is suspended via the horizontal shaft. Owing to such structure, not only the whole set equipment revolves around the central axle, the roller revolves along the inner ring of the ring under the effect of centrifugal force, but also the roller revolves on its own axle. Shovel frame is installed at the bottom end of the suspension rack, inclined shovels are installed at the lower flange of the shovel frame. The front end of the shovel approaches the chassis and the back end situated in a wedge-shaped gap formed by roller and ring. While turning together with the rollers, the shovels scoop up and throw the stuff into the gap between the rollers and the ring and then the stuff layer is extruded and ground there. The airflow coming from the bottom of the ring goes into the grinding chamber and takes the small powders into the separator to get the final products.

Working process of the powder concentrator, the separator makes vane on the turntable rotate via the speed regulating motor, which produces eddy effect to separate the grind stuff into the fine powder-product and the rough stuff. The rotating speed of the vane can be adjusted according to the requirement of the fineness of powder products. If much finer powders are needed the rotating speed will be increased, and the rough stuff can be thrown to the lower part of the grinding chamber and then be regrinded. Whereas, the powder fine enough will be collected as the final product by the cyclone collector.

The cyclone collector plays an important role in ensuring performance of the grinding mill. As the highly spinning air current mixed with grind stuff is blown into the cyclone-collector, the grind stuff is separated from the air-current. After separation, the air current moves downward, along the cone wall, to the end of the cone pipe. The fine powder will fall down and be collected there, and then the inner part of the air current is driven by the negative pressure upwards into the cylinder-shaped part of the pipe. At the end of the collector, there is a valve through which the fine powder is discharged. Due to the negative pressure, the lower-end of the collector must be tightly sealed up to prevent air in, otherwise the separated fine powder will be taken away again by the central air current, then the output-capacity of the whole equipment will be greatly reduced. Therefore, two sets of discharge set are installed at the bottom of the collector to isolate the negative pressure in the collector from the positive pressure outside. Its role is to open or close, assuring no air sucked into powder concentrator while discharging.

该款磨粉机与传统磨粉机相比具有如下特点：

1. 磨辊联动增压，运行平稳，产能先进，欧版磨机保留了专利超压梯形磨等磨机的诸多优点，特别是发扬了磨辊联动增压技术，极大地提高了设备的使用寿命，同时同等功率下，产量提升20%。

2. 锥齿轮整体传动，能量损耗小、效率高：传统磨机需另配减速机、通过联轴节传动主轴，安装时对中难度大，易产生噪音，降低效率。MTW系列欧版磨为锥齿轮整体传动，结构紧凑，传动平稳，传动比精确，传动链减少，安装调节更方便快捷，工作可靠，效率大大提高、寿命长。同时这种下沉式设计，使得机器运转比较平稳，有效避免机器震动。

3. 内部稀油润滑系统、先进可靠：传统磨机润滑形式为脂润滑，润滑阻力大、温升高、轴承寿命短，MTW系列欧版磨采用内部油泵，无需另外增加油泵或润滑站，就可以实现主轴轴承和圆锥齿轮轴承的润滑，同时采用水冷装置，极大地提高了设备的使用寿命。

4. 弧形风道、风量损失小、物料流动性好：传统磨机中的磨粉机风道，均为直板型风道。这种结构存在着气流冲击风道板产生阻力，气流分子间相互碰撞的能量损失大，易产生涡流导致风道堵塞等缺点，MTW系列欧版磨所采用风道为曲而型风道，切向气流进口顺滑，阻力小，内部出口方向有利于物料的分散，不容易堵料，大大提高风机效率。

5. 特殊磨辊及磨环结构设计、曲面可换刀铲刀，使粉磨效率提高、使用成本降低：传统磨机铲刀刀刃磨损较快，铲刀为整体铲刀，刃部磨损后，需要整体更换铲刀，浪费材料，增加停机更换时间。MTW系列欧版磨铲刀，刃部采用高耐磨合金材料，使用寿命长，更换时只需更换刀刃部分，提高了材料利用率。另外传统的平面型铲刀，物料铲起后堆积在一个层面上，使磨辊磨环中部磨损严重，曲面型铲刀可将物料导向立面，使磨辊磨环上、中、下部都能粉磨，使其均匀磨损，同时也增大了有效工作面积，从而提高了产量。

6. 无阻力进风蜗壳(小观察门无涡流)：传统磨机的进风蜗壳观察门内部门板内面向外凸出，与进风蜗壳内面不在一个平面上，这样就易产生涡流效应，增加系统能耗。MTW系列欧版磨采用内部门板内面与进风蜗壳内面在同一曲面上，这样就能有效的避免涡流效应。

7. 成品粒度可调可控、选粉效率高：分析机转速采用变频控制，转速更加精确，根据客户对成品细度的要求，可选择叶片式选粉机或笼式选粉机，细料分选效果更加。

8. 成品粉收集效率高，收集精度高：隔离式旋风集粉器的内筒与混合气粉流之间采用隔离结构，能够有效的提高成品粉收集效率和精度；旁路集粉器压力损失小，集粉效率高，特别有利于收集一般集粉器难以收集的微粉颗粒。

9. 人性化设计、易于操作。欧版磨机不仅内部采用了诸多先进结构，而目外观也采用优美的弧形结构设计，使整台机器更加人性化，降低了工人操作时产生的不必要损伤。

10. 注重环保理念。设备工作噪音小，配备先进的除尘器、粉尘排放浓度完全低于国家环保规定。

**The European Version Mill Compared with Traditional Mill Has the Following Characteristics:**

1. grinding roll linked pressure boost, smooth operation, advanced European version of the mill capacity to retain the advantages patented super pressure trapezium grinding mill, especially the mill roll forward linkage supercharger technology, which greatly improved the life of the equipment while the same power output up to 20%.

2. bevel gear integral transmission, power loss, high efficiency: the need to reproviseon the traditional mill reducer, by coupling the drive shaft, the installation of the difficulty, easy to produce indole tone. Reduce efficiency. MTW series European version of the mill for the overall drive bevel gear. Compact, smooth transmission, transmission ratio accurate transmission chain to reduce installation adjustment is more convenient, reliable, greatly improving the efficiency and long life. At the same time this sink design, making the machine run more stable, avoid machine vibration.

3. The internal lubrication system, advanced and reliable: the traditional form of the mill lubrication grease lubrication, resistance, temperature rise, short bearing life, MTW series European version of the mill with internal pump, without an additional pump or lubrication station, could achieve the spindle bearings and tapered gear shaft bearing lubrication, while using water-cooling device, which greatly improved the life of the equipment.

The curved duct, a small amount of wind damage, material flow is good: the traditional wind mill in Mill Road, are bar-type duct. This structure exists impact of air duct panels generate resistance, high airflow molecules collide ask energy loss, easy to produce eddy currents cause duct blockage and other shortcomings, MTW series European version of the mill used for the song and duct type air duct, cut smooth the flow of imports, resistance, internal export orientation in favor of dispersed material, not easy blocking material, greatly improving the efficiency of the fan.

5. Special grinding roller and grinding ring structure design, replaceable blade curved blade, so that the grinding efficiency, reduce costs: the traditional mill blade wear faster blade, blade for the whole blade, blade portion after wear, the need to replace the whole blade, material waste, increasing downtime replacement time. MTW series European version of the mill blade, the blade made of high wear-resistant alloy, long life, simply replace the replacement blade section, improve material utilization. Another conventional planar blade, after scooping up the material deposited on one level, so that the middle of the roller mill ring badly worn, curved blade type material can be oriented facade, so the roller mill ring, middle and lower part of the can grinding to uniform wear, but also increases the effective working area, thereby increasing the yield.

6. No resistance inlet volute (small observation door without vortex): a traditional mill inlet volute observed protruding outside the door for the department board, with inlet volute surface is not a plane, so easy to produce a vortex effect, increasing energy consumption. MTW series European version of the mill with internal door and the inner surface of the inner surface of the inlet volute on the same surface, so that we can effectively avoid eddy current effects.

7. Finished size adjustable control, high efficiency separator: analysis using variable frequency motor speed control, the speed is more accurate, according to customer requirements for product fineness can choose vane separator or cage separator, fines sorting effect is more.

8. finished powder high collection efficiency, high precision collected: Jane powder inside the isolated whirlwind powder mixed gas stream and ask the use of isolation structure, can effectively improve the efficiency and accuracy of the finished powder was collected; Bypass powder collector pressure loss small, high efficiency dust collection, particularly conducive to collect powder particles are generally difficult to collect the

powder collector.

9. The user-friendly design, easy to operate. European version of the mill not only uses a lot of advanced internal structure, but also the use of mesh beautifully curved exterior design, so that the entire machine is more humane, reducing unnecessary damage generated when the workers to operate.

10. environmentally friendly philosophy. Work equipment noise, equipped with advanced dust, dust emission concentration well below the national environmental regulations.

**二、整机的安装、调试:**

**整机的安装**

**(一) 安装前的准备事项**

1. 磨粉机运到现场还未安装前，应妥善保管，外露表面须涂上防锈油脂、并避免日晒雨淋，以防机体生锈进水，要建立保养制度。

2. 厂房和基础应根据基础图尺寸留有足够的高度和安装位置，磨机基础应采用高标号水泥，埋有钢筋后方能浇筑基础，并预埋穿线管或电缆沟。水泥基础浇好后，必须有15天的保养期。

3. MTW110应配有5-8吨起吊工具；MTW138应配有8-15吨起吊工具；MTW175应配有35吨以上起吊工具；供安装维修用。

4. 磨粉机从出厂到使用时间超过6个月者，对主机中心轴系统、传动装置、选粉机油池等应清洗检查，清洗检查完毕后应对各部件加入足够的润滑油脂。



 制作基础时应按照专用基础图在工程师指导下施工，若因特殊情况需要改动的，用户须事先联系公司更改图纸。

**2. Installation and Commissioning**

**The Whole Set Installation:**


**(1). Preparation for Installation**

1. Before installation, the grinding mill should be properly kept. To avoid the rain and sunshine, its exposed surface should be oil applied and maintenance regime is highly suggested.

2. Enough installation space for the workshop and foundation should be reserved according to the installation diagram. The foundation for installing the grinding mill should be built with high-grade cement, and before the building of the foundation, steel reinforcement should be laid. The tubes and trenches for electrical cable and other wire rod should also be embedded in the foundation. After the building of the foundation, 15 days of maintenance is required.

3. For the requirement of installation and maintenance, a crane of 5-8 ton is needed for MTW110; a crane of 35 ton is needed for MTW175;

4. If the time from the delivery date to the first use of the grinding mill has exceeded 6 months, the central axle system of the mainframe, the transmission gear, roller device and oil tank of the separator should be checked and cleaned, and then be grease applied again.

 Foundation-making should be in accordance with specific foundation drawing. if space constraints require changes, the user must contact the company in advance to change the drawing.

## (二) 磨粉机的安装

1. 主机安装。主机安装时应在主机机座下端平面与水泥基础接触处加橡胶垫板，地脚螺栓与机座间垫上橡胶垫套(见图2)，然后用框形水平仪校正机座“A”或“B”平面，校正点为交叉十字线四点，通过调整确保“A”或“B”平面保持水平(见图1)。

2. 主机电机的安装。主机电机的安装位置需保证大、小带轮的轴线相互平行，各带轮相对应的槽型对称平面应重合。

3. 选粉机的安装(见图3)。选粉机和主机间是通过橡胶条及压紧装置等进行的联接。首先将橡胶条安装在主机罩筒上端法兰内，然后将选粉机准确吊装在主机之上，并压紧主机与选粉机间的压紧装置。

4. 风机的安装(MTW110和MTW175)。按照安装基础图上的位置要求进行安装(见图4)，安装时同样需保证两三角带轮间的相对位置符合要求。

5. 集粉器的安装。按照安装基础图上集粉器的结构型式，将集粉器的直筒部分、锥筒部分、蜗壳部分、锥阀、支架支腿联在一起并用角钢加强，然后安放在其所在位置上。分别调整进排气口位置并与活法兰焊接。

6. 管道安装前应将主机、风机的地脚螺栓浇注固定，待初步凝固后，再进行管道的安装与连接。管道装置的位置和高度应按总图安装，不得任意改动和加高，各管道连接处应密封，紧固后不得有漏气现象。

7. 冷却管道的安装。用户应根据工作环境温度及试机时的主机齿轮箱和风机轴承座的温升情况决定是否安装冷却水管道。

## (2) The Installation of Grinding Mill

1. Install the mainframe: Put rubber pads at the interface between the bottom of the mainframe and the foundation surface, between the mainframe seat and foundation bolts. (see diagram 2) Then check and ensure the levelness of the mainframe seat surface A or B with sash shape gradienter by checking at 4 points on the intersectional crossing lines. Guarantee the levelness of surface A or B through adjustment. (see diagram 1)

2. Install motor for the mainframe: The installation of motor for the mainframe must ensure the axes of big and small belt are parallel to each other. Symmetrical planes of the two pulley grooves should coincide.

3. Install separator (see diagram 3): The separator is connected with mainframe by rubber band and fastening device. First, install rubber band in the upper flange of mill frame. Then accurately sling the separator on the mainframe and fasten the fastening device between the separator and the mainframe.

4. Install blower (MTW110 and MTW175): Install it in accordance with installation diagram (see diagram 4). And ensure the relative positions of the two pulleys are up to the requirement.

5. Install the collector: According to the installation diagram, join the straight, cone, cone valve and support legs and place them in their positions.

6. Before the installation of pipeline, the foundation bolts of mainframe and blower should be fixed through pouring. And after their initial solidification, install and connect the pipelines. The position and height of pipeline system should be installed strictly in accordance with the diagram. No change is permitted. The links of the pipelines should be sealed tightly to prevent air leakage. All the electrical devices should be reliably and precisely installed, and must be tested after all the components have been installed.

7. Install the cooling pipe: User should decide whether to install cooling water pipeline according to the working ambient temperature and the temperature rise of mainframe gear box when trial-run.



否平稳，有无异常噪音和振动，滚动轴承最高温度不得超过70℃，温升不超过35℃。

6. 如果主机齿轮箱体的油温及风机轴承座的温升超过了规定，用户需安装水冷管道，对其进行冷却。

7. 负荷运转试机时间不少于8小时，磨机工作正常后整机无异常噪音，各管道连接处无漏风现象，经试机后再次把各紧固件拧紧，即可投入正常使用。

## 8. 振动给料的控制及给料

电磁振动给料机的结构原理：电振机是一个双质点定向强迫振动系统，由料槽连接叉衔铁所组成，其悬挂在料仓下端并有一定的游动间隙呈自由状态，不得有卡住或与它物相碰现象，以免工作时产生噪音。

(1) 电振机安装后，将作用在定位连接叉上的螺钉松开(上三下一个)，松开后用螺母拧紧，打开电振器后盖，检查铁芯与衔铁间隙应在1.8-2.1毫米内，并两者应平行清洁。各螺钉应坚固，最后将盖装上固定。

(2) 通电空载试验，将电控箱调幅电位器R1由小逐渐加大，其振幅应在1.8-2.5毫米间，电流小于3.5安，连续工作数小时以上振幅电流是否稳定；正常后打开料仓闸门送料，观察其给料量电流是否稳定，允许振幅下降0.5毫米，如振幅电流均达额定值仍未满足给料量要求，需将振动给料机吊装倾斜一定的角度，使之满足给料量的要求为止。



本公司不负责电路布置，电路连接、变压器配置等，用户可根据产品电力配置由专业电工规划用电、连接线路。

## (3) Debugging ( Trial Run Without Load )

1. The lower the working length the pressure spring ( effective length after being compressed ) is, the more pressure roller exerting on material is, the higher the capacity is. However, load of main motor shall be taken into consideration. MTW110 working length of spring shall be controlled between 170-190mm. MTW138 working length of spring shall be controlled between 200-210mm. MTW175 working length of spring shall be controlled between 250-280mm.

2. Before the trial run, adjust the fastening device between the mainframe and the separator. Ensure the rubber pad between the mainframe and separator is fully pressed and tightly sealed.

3. Adjust the rotating speed of electromagnetic speed regulating motor to reach different finish fineness. The higher the rotating speed is, the smaller the fineness is.

4. Lubrication points of all the moving parts should be filled with lubricating grease in accordance with lubrication system diagram and lubrication position diagram. The trial run must be unloaded. Before trial run, the roller device should be tightly bound with steel cables to prevent collision of the rollers against the ring. The trial run without load should last not less than two hours. During the trial run, the mainframe should run smoothly and steadily, oil temperature in the mainframe gear box shall not surpass 75℃. with increase of temperature not over 40℃. And the oil temperature of separator gear box, mainframe bearing and roller device bearing shall not surpass 80℃. with increase of temperature not over 40℃. The rotation direction of the mainframe, the separator and the blower can be referred to diagram 5.1-5.2.

5. To start blower valve must be closed first. After it getting into normal operation, the valve can be opened (the valve is located on the return air pipe connecting to the blower inlet). The trial-run should be watched closely. Normally it should run smoothly and

steadily, and without unusual noise and vibration. The highest temperature of rolling bearing should below 70°C, with increase of temperature below 35°C.

6. If the oil temperature of mainframe gear box and blower bearing seat surpass the stated temperature, user should install water cooling pipeline for cooling.

7. The loaded trial run should last not less than 8 hours. The normal operation should be smooth, steady and noiseless, without air-leakage at the link of pipeline. After the trial, fasten every jolt, and then it can be put into use.

8. Vibrating feeder's operation and feeding:

Electromagnetic vibrating feeder's structure and working principle: Electromagnetic vibrating feeder consists of chute, yoke and armature. It is a directional compulsory vibrating system with double particles and is freely hanged at the lower end of the hopper with certain space for moving. For the sake of avoiding noise, it must be ensured that no jamor collision with other component would happen.

(1) After the installation of vibrator, unlock the screws on the directional yoke (three above and one below) and tighten them by screw nuts. Open the rear cover of the electromagnetic vibrator to make sure the gap between the steel core and the armature is 1.8-2.1 mm, and then tighten the screw and the cover.

(2) In the trial run without load, increase the potential device "R" gradually. The range of the amplitude should between 1.8-2.5mm and the current flow should less than 3.5A. Trial run should lasts for hours to make sure stable amplitude and the current flow, then to feed materials to test the stability of current flow. The amplitude is allowed to decrease by 0.5mm. If the amplitude and current flow have reached rated value and still can not meet the demand of feeding amount, lean the vibrating feeder by a certain angle to reach the feeding amount.



The company is not responsible for the circuit layout or connections, transformer configuration, the user should configure the product by a professional electrician electricity planning, connection lines.

### 三、磨粉机的操作规程

启动磨粉机前, 应检查所有检修门关闭是否严密, 检查颚式破碎机的颚板间隙是否符合进料粒度尺寸, 调整选粉机转速应达到近似成品粒度要求。最后按以下顺序开机:

1. 启动畚斗提升机;
2. 启动颚式破碎机;
3. 待料仓存有物料后, 启动选粉机;
4. 启动离心引风机(空负荷启动, 待正常运转后再加载);
5. 先启动主机, 后启动电磁振动给料机。此时粉磨工作即为开始;

操作顺序简易表示如下: “启动”、提升机→破碎机→(MTW175) 启动集粉器螺旋输送机→选粉机→风机→主机→给料机

停机时应按照下列顺序关闭各机:

1. 先关闭给料机停止给料;
2. 约一分钟后停止主机;
3. 吹净残留的粉子后停止离心引风机;
4. 关闭选粉机;

停机的顺序是: 给料机→主机→引风机→选粉机

注: (1) 提升机运输物料至料仓一定量后, 先停止破碎机而后再停止提升, 此项应随储料量变动。

(2) 磨粉机在正常工作时不准检修和加油, 以确保安全。磨粉机任何部位出现不正常噪音, 或负荷突然增

大应立即停机检查, 排除故障。如果磨机内物料较多, 再次开机前必须将磨机内已经存有的物料取出, 否则再次开机时会使启动电流过大, 造成启动困难甚至烧毁电机。

### 3. Operation Instruction

Before starting the grinding mill, check all the doors and ensure they are closed tightly, check and ensure the feed opening of jaw crusher is wide enough for the raw materials, adjust and ensure the speed of the separator is suitable to the required specification of powder-products.

Then start the equipments in the following sequence:

1. Start the bucket elevator.
2. Start the jaw crusher.
3. After the hopper is filled with stuff, start the separator.
4. Start the blower (first without load, after normal operation with load added).
5. Start the mainframe, instantaneously start the electromagnetic vibrating feeder.

So the whole set is operating.

Simple representation of operating sequence:

Start → elevator → crusher → (MTW175) start powder collector screw conveyor → powder selector → blower → main unit → feeder

Turn-off procedures:

1. Stop the feeder.
2. About one minute later, stop the mainframe.
3. After blowing all the leftovers, turn off the blower.
4. At last, turn off the separator.

Turn-off Procedure: Feeder → Main frame → Blower → Separator

Notes: (1) After the material in the hopper has reached the certain amount, the jaw crusher should be switched off first, and then the elevator. This rule depends on the variation of the starting amount.

(2) During the normal operation of the grinding mill, adding grease is forbidden. To ensure the safety during production, the grinding mill should be stopped to check and get rid of trouble when there's any unusual noise from any parts of grinding mill or sudden increase of loading. Take out all the leftovers before starting the machine again, or the motor will be burned out as a result of the oversize current when start it.

### 四、润滑系统

为了保证整机的正常运转, 应按下表要求和方法进行加油。润滑部位和油脂名称均在下表中表明。(润滑位置详见图9)

润滑部位	润滑形式		润滑油名称	润滑 点数	每次加油时间	备注
	人工	油箱				
主机主轴承部位	△		ZL-1锂基润滑脂	2	1-3天	
	△		ZL-1锂基润滑脂	10	2班	
引风机轴承座	△		ZL-1锂基润滑脂	2	一周	
选粉机轴承座	△		ZL-1锂基润滑脂	1	一周	
提升机轴承座	△		ZL-1锂基润滑脂	2	一周	
提升机蜗轮箱		△	HJ-40机械油	1	保持油位线	三个月换油一次
主机齿轮箱		△	L-CKC-68齿轮油 (L-FC68: 轴承油)		初次500小时 以后2000小时	保养、清洗、换油
选粉机油池		△	HJ-40机械油		初次500小时 以后2000小时	保养、清洗、换油

### 4. Lubrication System

To ensure the normal operation, lubrication should be done in accordance with the methods specified in the following table. The position for lubrication and types of grease are also clearly stated in the following diagrams. (The position for lubrication can be seen in diagram 9.)

Position for Lubrication	Methods		Types of Grease	Lubrication Point	Time	Notes
	Hand	Oil Case				
Upper bearing of mainframe's main shaft	△		ZL-1-lithium-based grease	2	1-3 days	
Rollers system	△		ZL-1-lithium-based grease	10	2 shifts	
Bearing seat of blower	△		ZL-1-lithium-based grease	2	1 week	
Bearing seat of separator	△		ZL-1-lithium-based grease	1	1 week	
Beating seat of elevator	△		ZL-1-lithium-based grease	2	1 week	
Gear box for elevator		△	HJ-40	1	Level mark	Change oil every three months
Gear box of mainframe		△	Gear oil L-CKC-68(can be replaced by bearing oil L-FC68)		First time 500 hours, after wards 2000 hours	Servicing, cleanness, replacement
Oil tank of separator		△	HJ-40		First time 500 hours, after wards 2000 hours	Servicing, cleanness, replacement

## 五、磨机的维护、保养

1.磨粉机使用过程中，应有固定人员负责看管，操作人员必须具备一定的技术水平，磨粉机安装前对操作有关人员必须进行技术培训，使之了解磨机的原理性能，熟悉操作规程。

2.为使磨机正常工作，应制订设备“维修保养安全操作制度”方能保证磨机长期安全运行，同时要有必要的检修工具以及润滑油和配件。

3.磨机使用一段时期后，应对磨辊、磨环、铲刀、衬板等易损件进行检修或者更换。磨辊装置在使用前后对连接螺栓螺母塞均应进行仔细检查，是否有松动现象，润滑油脂是否加足。如果不及时更换磨损严重的零件将导致严重后果！

4.磨辊部件使用时间超过500小时左右，应对辊套内的各滚动轴承检修，必要时更换磨损严重的零件。

5.磨辊部件在使用前或者加油时要检查各连接部位螺栓、螺母是否松动。

6.磨机中使用左旋螺母的位置有：主机主轴上端锁紧螺母、磨辊主轴最上端及最下端共9处(见图10)。

### 5.Maintenance and Repair

1.During the operation of the grinding mill, there must be permanent professional staff being in charge of it. Prior to installation of the equipment, people concerned with operation, maintenance and electricity must be technically trained, And let them know the principle and performance of the grinding mill, and be familiar with the operation procedures.

2.To ensure normal operation of the equipment, laying down maintenance and safe operation system of the equipment is required. Simultaneously, necessary tools for checking and repairing, lubricating oil and grease and spare parts must be available for immediate use.

3.After a period of usage, check the equipment and replace tear and wear parts such as rollers, rings and shovels. Be sure of fastening connecting-bolts and nuts. Be sure of lubricating the parts sufficiently. Serious results will be lead to if not change the badly worn spare parts timely.

4.Roller should be replaced after 500-hours use. To clean bearings in them and replace broken ones, and then fill enough oil and grease(with oil-pump or grease-gun).

5.The positions of left-handed nuts in the grinding mill: locknut at the upper end of main shaft, the top and lowest ends of-roller shaft in total 9 positions (see diagram 10).

## 六、常见故障及排除方法

磨粉机在使用过程中所出现的故障，可按如下表进行处理。

常见故障	产生原因	排除方法
1.不出粉或出粉少产量低	(1)锁粉器未调整好，密封不严 (2)铲刀磨损大物料铲不起。	(1)检查和调整好锁粉器密封，发现漏洞处应堵住。 (2)更换新铲刀。
2.成品粉子过粗，或过细	(1)选粉机叶片磨损严重，不起分级作用。 (2)风机风量不适当。	(1)更换叶片并适当关小风机进风量能解决过粗。 (2)过细应提高进口风量。
3.主机电流上升，机温上升，风机电流下降	给料过量，风道被粉料堵塞，管道排气不畅循环气流发热使主机电流，机温升高，风机电流下降。	(1)减少进料量，清除风道积粉。 (2)开大排气管阀门，进机物料湿度控制在6%以下。
4.主机噪音大并有较大振动	(1)进料量小，地脚螺栓松动。 (2)料硬冲击大，或无料层。 (3)磨辊磨环失圆变形严重。	(1)调整给料量，加固地脚螺栓。 (2)减少进料粒度。 (3)更换磨辊、磨环。
5.风机振动	(1)风叶上积粉或磨损不平衡。 (2)地脚螺栓松动。	(1)清除叶片积粉或更换叶片。 (2)拧紧地脚螺栓。
6.齿轮传动装置和选粉机油箱发热	机油粘度大，螺纹泵打不上去油使上部轴承缺油。	(1)检查机油的牌号和粘度是否与要求相符。 (2)检查选粉机运转方向。
7.进粉轴承易损坏	(1)断油、或密封圈损坏。 (2)长期缺乏维修和清洗。	(1)按规定时间及时加油。 (2)定期清洗，更换油封。

### 6.How to Fix Common-Disorders

The Methods to Fix Common-Disorders are Suggested in the Following Table:

Common Disorders	Causes	Ways to Fix
1.No or less powder-output,low capacity.	(1)Powder-locking device is not sealed-up. (2)Shovels worn out.	(1)Check powder-locking device and make it sealed-up (2)Replace the worn shovels
2.Powder too rough or too fine.	(1)Separator vanes worn out and can not function in grading. (2)Air flow is improper.	(1)Replace the vanes and decrease airflow if powder is too rough (2)Increase airflow if powder is too fine.
3.The mainframe electric current and the heat of the main motor goes up the current of the blower comes down.	Too much amount of feeding, blocking up of the flow channel, pipes not working well.	(1)Reduce feeding amount, clear-up the flow channel. (2)Open the valve of vent pipe wide, control the material humidity under 6%.
4.Abnormal noise and too much of the mainframe.	(1)Too small amount of feeding, loosening of foundation bolts. (2)Too hard material processed. (3)Rollers and tings distorted.	(1)Adjust the amount of feeding, fasten the foundation bolts. (2)Diminish feeding size. (3)Replace rollers and ring.
5.Vibration of blower.	(1)Too much powder on vanes or imbalance arousing by wear and tear of vanes. (2)Loosening of foundation bolts.	(1)Get rid of powder on the vanes or replace the vanes. (2)Fasten the foundation bolts.
6.Heat-up of transmission gear and separator's oil tank.	(1)Oil too sticky,pump can not function properly.	(1)Check and ensure the right oil used. (2)Check revolving direction of the separator.
7.Powder entering into roler assembly makes bearing wear out easily.	(1)Shortage of oil or breakdown of sealing ring. (2)Lacking maintenance and clearance for too long.	(1)Fill oil timely according to specified time. (2)Clear up and replace oil seal regularly.

## 七、主要部件的拆卸和安装

### 1. 主机齿轮箱部分的拆装(见图11)

#### (1) 拆卸顺序

胶管总成→冷却器→传动轴部件→主轴下端盖→轴承套→齿轮箱体→主轴最下端轴承→轴承垫→主轴下端轴承→泵油盘→主轴隔套→大锥齿轮→主轴上螺母→主轴。

#### (2) 拆卸方法

胶管总成、冷却器、传动轴部件、主轴下端盖、轴承套、齿轮箱体等依次拆卸后，如其余零件仍附着在主轴上，可用硬木块或软金属垫在大锥齿轮的上端面上，用重物击打大锥齿轮，使主轴上的其余零件脱落，实现拆卸的目的。

#### (3) 齿轮箱部位的安装

安装时将齿轮箱体、轴承套、主轴下端盖、主轴下端轴承及两轴承间的垫装到主机座上，而后将已经装上大锥齿轮、主轴隔套、泵油盘的主轴，从上往下装上即可。

### 2. 主轴上端轴承部位的拆卸和安装(见图1)

(1) 拆卸时应将磨辊吊架、铲刀架及其上的轴承、骨架油封、密封垫片等一同向上拉出，再将磨辊吊架和铲刀架卸开。然后分别将轴承、骨架油封、密封垫片从铲刀架中拆出。(注意：1.拆卸时应确定立式轴承座处于固定状态。2.在初步确定轴承和骨架油封的受损程度，再确定二者的拆卸方法)

(2) 安装时应先将铲刀架及下盘装上，并在铲刀架下盘的四周垫上10毫米厚的垫块，再分别装密封垫片、骨架油封、轴承、磨辊吊架、螺母止退垫、主轴上螺母。主轴上螺母拧紧前应将铲刀架下盘的垫块去掉。

### 3. 传动轴部件的拆卸和安装(见图12)

(1) 拆卸时应先将大带轮、大带轮涨套拆掉，而后将传动轴、小锥齿轮拉出、再分别将传动轴架内两端的轴承圈拉出即可。

(2) 安装时应先将轴承的内圈按照图中所示位置及朝向装到传动轴的两端，再装上小锥齿轮，然后装圆柱滚子轴承及圆锥滚子轴承的外圈及滚子，最后上传动轴隔套(含O形圈)、轴承压盖、骨架油封等。

### 4. 磨辊装置的拆卸和安装(见图13)

(1) 拆卸时应先去掉磨辊上端盖、磨辊螺母，再将磨辊轴连同磨辊、磨辊芯一同拉出，最后将其余零件分别取出即可。

(2) 安装时应先把磨辊套下端的轴承装到磨辊轴上，而后将二者一同装到磨辊套上，然后装压盖骨架油封、垫片、毛毡、压盖螺母等，再掉头装轴承、磨辊螺母、磨辊上端盖，最后装磨辊、磨辊芯等。(注意：装磨辊螺母时必须拧紧，且必须装上止退垫圈)。

## 7. Disassembly and Installation of Main Parts

1. Disassembly and installation of mainframe gear box(see diagram 11):

#### (1) Disassembly procedure

Hose assembly→Cooler→Drive shaft part→Lower cover of main shaft→Bearing sleeve→Gear box→Bearing pad→Lower bearing of main shaft→Pump oil pan→Main shaft bushing→Big cone gear→Upper nut of main shaft→Main shaft

#### (2) Disassembly method

Disassemble, cooler, drive shaft part, lower cover of main shaft, bearing sleeve and gear box in sequence. After this if there are still parts adhering to the main shaft, user should put hard wood block or soft metal pad on the upper end of big cone gear. Then hit it heavily to make the parts fall off and realize the purpose of assembly.

#### (3) Disassembly of gear box

Install gear box, bearing sleeve, lower cover of main shaft, lower bearing of main shaft and pad between the two bearing on the mainframe seat. Then install the main shaft fitted with big cone gear, main shaft bushing and pump oil pan from top to bottom.

2. Disassembly and installation of main shaft upper bearing(see diagram 11):

(1) When disassembling pull up roller hanger, shovel frame and its bearing, oil seal and gasket out of mill frame. Then disassemble the roller hanger and shovel frame, and disassemble the bearing, oil seal and gasket respectively from the shovel frame. (Note: 1. Make sure the vertical bearing seat is in a fixed state when disassembling. 2. Initially determine bearing and oil seal's degree of wear, and then determine their

disassembly methods.)

(2) When installation, first install the shovel frame and chassis and put padding blocks with 10 mm thickness around the chassis. Then install gasket, oil seal, bearing, roller hanger, retaining pad of upper nut and upper nut of main shaft. Remove the padding blocks before fastening the upper nut of main shaft.

3. Disassembly and installation of drive shaft(see diagram 12)

(1) When disassembly first take down the big pulley and expansion sleeve, and pull out the drive shaft and the small cone gear. Then pull out the bearings at the two end of the drive shaft.

(2) When installation first install the inner rings of bearing at the two ends of the drive shaft according to the position and direction shown in the diagram. And install small cone gear, cylindrical roller bearing and outer ring and rollers of tapered roller bearing in sequence. Then install drive shaft bushing(including O-ring), bearing cover and oil seal.

4. Disassembly and installation of roller assembly(see diagram 13)

(1) When disassembly first removes the top cover of roller and roller nut, and pull out roller shaft together with roller and roller core. Then take out the rest parts.

(2) When installation first installs the bearing 22326cc on the roller shaft, and installs them in the roller sleeve. Then install cover, oil seal, gasket, felt gasket and cover nut. Change to the other end and install bearing, roller nut and top cover of roller. At last, install roller and roller core. (Note: Roller nut must be tightened and must be installed with retaining washer.)

## 八、各部位易损件名称、数量

MTW欧版磨粉机所用易损件见下表。目的是方便用户，参考购置。

MTW110欧版磨粉机易损件清单如下：

序号	国标号	名称	数量	备注
01	GB/T288-94	调心滚子轴承23034CC/W33(φ179×φ260×67)	1	主轴上
02	GB/T288-94	调心滚子轴承22324CC(φ120×φ260×86)	1	主轴下
03	GB/T301-95	推力球轴承51328(φ140×φ240×80)	1	主轴最下
04	GB/T297-94	圆锥滚子轴承32315(φ75×φ160×58)	4	磨辊上
05	GB/T288-94	调心滚子轴承22319CC(φ95×φ200×67)	4	磨辊下
06	GB/T297-94	圆锥滚子轴承30315(φ75×φ160×400)	1	选粉机上
07	GB/T297-94	圆锥滚子轴承30312(φ60×φ130×33.5)	1	选粉机下
08	GB/T276-94	深沟球轴承6310(φ50×φ110×27)	1	选粉机横内
09	GB/T281-94	调心球轴承1311K(φ55×φ120×29)	1	选粉机横外
10	GB/T288-94	调心滚子轴22316CC/W33(φ80×φ170×58)	2	离心引风机
11	GB/T297-94	圆锥滚子轴承32216(φ80×φ140×35)	2	传动轴部件
12	GB/T283-94	圆柱滚子轴承NF2317M(×φ85×φ180×60)	1	传动轴部件
13	GB9877.1-88	骨架油封(FBφ180×210×15)	1	主轴上端
14	GB9877.1-88	骨架油封(Bφ100×φ125×12)	2	传动轴部件
15	GB9877.1-88	骨架油封(B×φ80×φ100×10)	4	磨辊上端
16	GB9877.1-88	骨架油封(B×φ105×φ130×12)	8	磨辊下端
17	GB/T3452.1-92	O型橡胶密封圈307×5.3	1	轴承套处
18	GB/T3452.1-92	O型橡胶密封圈250×5.3	1	主轴下端处
19	GB/T3452.1-92	O型橡胶密封圈77.5×3.55	1	传动轴隔套上
20	JB/T(6142.1-4)-92	锥密封棉线编织胶管总成10/M24×1.5-800	1	冷却器部位
21	JB/T(6142.1-4)-92	锥密封棉线编织胶管总成10/M24×1.5-500	1	冷却器部位
22	GB/T11544-1997	三角带SPB-2800	4	选粉机
23	GB/T11544-1997	三角带C-3150	6	风机电动机
24	GB/T11544-1997	三角带15N-3000	11	主机电动机
25		衬板	1	

序号	国标号	名称	数量	备注
26		大锥齿轮	1	主机齿轮箱内
27		小锥齿轮	1	主机传动轴上
28		铲刀刃	4	
29		铲刀座	4	
30		磨辊部件	4	
31		橡胶套	8	
32		磨辊	4	
33		磨辊轴	4	
34		横担轴	4	
35		磨环	1	
36		风机叶轮	1	
37		铲刀架下盘	1	
38		压盖	4	
39		选粉机叶片	80	
40		风道护板	10	
41		弹簧拉轴	4	
42		弹簧	4	
43		横担轴垫	8	
44		磨辊套	4	
45		横担轴套	8	
46		垫片	12	磨辊部件密封
47		磨辊套上压盖	4	
48		小锥齿轮	1	选粉机油池
49		大锥齿轮	1	选粉机油池
50		密封垫片	3	主轴上端
51		铰座	1	
52		磨辊螺母	8	
53		磨辊吊架	1	
54		压轴盖	8	

MTW138欧版磨粉机易损件清单如下：

序号	国标号	名称	数量	备注
01	GB/T288-94	调心滚子轴承23044CC/W33( $\phi 220 \times \phi 340 \times 90$ )	1	主轴上
02	GB/T288-94	调心滚子轴承22328CC( $\phi 140 \times \phi 300 \times 102$ )	1	主轴下
03	GB/T301-95	推力球轴承51334( $\phi 170 \times \phi 280 \times 87$ )	1	主轴最下
04	GB/T297-94	圆锥滚子轴承32319( $\phi 95 \times \phi 200 \times 71.5$ )	4	磨辊上
05	GB/T288-94	调心滚子轴承22326cc( $\phi 130 \times \phi 280 \times 93$ )	4	磨辊下
06	GB/T297-94	圆锥滚子轴承30315( $\phi 75 \times \phi 160 \times 40$ )	1	选粉机上
07	GB/T297-94	圆锥滚子轴承30312( $\phi 60 \times \phi 130 \times 33.5$ )	1	选粉机下
08	GB/T276-94	深沟球轴承63110( $\phi 50 \times \phi 110 \times 27$ )	1	选粉机横内
09	GB/T281-94	调心球轴承1311K( $\phi 55 \times \phi 120 \times 29$ )	1	选粉机横外
10	GB/T288-94	调心滚子轴承22320CC/W33( $\phi 100 \times \phi 215 \times 73$ )	2	离心引风机
11	GB/T297-94	圆锥滚子轴承32220( $\phi 100 \times \phi 180 \times 49$ )	2	传动轴部件

序号	国标号	名称	数量	备注
12	GB/T283-94	圆柱滚子轴承NF2320M( $\phi 100 \times \phi 215 \times 73$ )	1	传动轴部件
13	GB9877.1-88	骨架油封(FB $\phi 250 \times \phi 290 \times 15$ )	1	主轴上端
14	GB9877.1-88	骨架油封(8 $\phi 120 \times \phi 150 \times 12$ )	2	传动轴部件
15	GB9877.1-88	骨架油封(B $\phi 110 \times \phi 140 \times 12$ )	4	磨辊上端
16	GB9877.1-88	骨架油封(B $\phi 140 \times \phi 170 \times 15$ )	8	磨辊下端
17	GB/T3452.1-92	O型橡胶密封圈365 $\times 5.3$	1	轴承套处
18	GB/T3452.1-92	O型橡胶密封圈290 $\times 5.3$	1	主轴下端处
19	GB/T3452.1-92	O型橡胶密封圈97.5 $\times 5.3$	1	传动轴隔套上
20	JB/T(6142.1-4)-92	锥密封棉线编织胶管总成15/M30 $\times 2-1500$	1	冷却器部位
21	JB/T(6142.1-4)-92	锥密封棉线编织胶管总成15/M30 $\times 2-1500$	1	冷却器部位
22	GB/T11544-1997	三角带SPB-3150	4	选粉机
23	GB/T11544-1997	三角带SPC-3150	10	风机电动机
24	GB/T11544-1997	三角带25N-3600	8	主机电动机
25		毛毡圈	8	磨辊下端盖
26		衬板	1	
27		大锥齿轮	1	主机齿轮箱内
28		小锥齿轮	1	主机传动轴上
29		铲刀刃	4	
30		铲刀座	4	
31		磨辊部件	4	
32		橡胶套	8	
33		磨辊	4	
34		磨辊轴	4	
35		横担轴	4	
36		磨环	1	
37		风机叶轮	1	
38		铲刀架下盘	1	
39		压盖	4	
40		选粉机叶片	90	
41		风道护板	12	
42		弹簧拉轴	4	
43		弹簧	4	
44		横担轴垫	8	
45		磨辊套	4	
46		横担轴套	8	
47		垫片	12	磨辊部件密封
48		磨辊套上压盖	4	
49		小锥齿轮	1	选粉机油池
50		大锥齿轮	1	选粉机油池
51		密封垫片	3	主轴上端
52		铰座	1	
53		磨辊螺母	8	
54		磨辊吊架	1	
55		压轴盖	8	



MTW175版磨粉机易损件清单如下：

序号	国标号	名称	数量	备注
01	GB/T288-94	调心滚子轴23052( $\Phi 260 \times \Phi 400 \times 104$ )	1	主轴上
02	GB/T288-94	调心滚子轴22338( $\Phi 190 \times \Phi 400 \times 132$ )	1	主轴下
03	GB/T301-95	推力球轴承51344( $\Phi 220 \times \Phi 360 \times 112$ )	1	主轴最下
04	GB/T297-94	圆锥滚子轴32322( $\Phi 110 \times \Phi 240 \times 84.5$ )	4	磨辊上
05	GB/T288-94	调心滚子轴22328CC( $\Phi 140 \times \Phi 300 \times 102$ )	4	磨辊下
06	GB/T297-94	圆锥滚子轴30318( $\Phi 90 \times \Phi 190 \times 67.5$ )	1	选粉机上
07	GB/T297-94	圆锥滚子轴承30316( $\Phi 80 \times \Phi 170 \times 60$ )	1	选粉机下
08	GB/T276-94	深沟球轴承6416( $\Phi 80 \times \Phi 200 \times 48$ )	1	选粉机横内
09	GB/T288-94	调心滚子轴22316CC/W33( $\Phi 80 \times \Phi 170 \times 58$ )	1	选粉机横外
10	GB/T288-94	调心滚子轴22324CC/W33( $\Phi 100 \times \Phi 215 \times 73$ )	2	离心引风机
11	GB/T288-94	调心滚子轴23226( $\Phi 130 \times \Phi 230 \times 80$ )	1	传动轴部件
12	GB/T297-94	圆锥滚子轴32224( $\Phi 120 \times \Phi 215 \times 61.5$ )	2	传动轴部件
13	GB9877.1-88	骨架油封(FB $\Phi 280 \times \Phi 320 \times 20$ )	1	主轴上端
14	GB9877.1-88	骨架油封(B $\Phi 150 \times \Phi 180 \times 15$ )	2	传动轴部件
15	GB9877.1-88	骨架油封(FB $\Phi 120 \times \Phi 150 \times 12$ )	5	磨辊上端
16	GB9877.1-88	骨架油封(FB $\Phi 150 \times \Phi 180 \times 15$ )	10	磨辊下端
17	GB/T3452.1-92	O型橡胶密封圈462 $\times$ 7	1	轴承套处
18	GB/T3452.1-92	O型橡胶密封圈387 $\times$ 7	1	主轴下端处
19	GB/T3452.1-92	O型橡胶密封圈200 $\times$ 5.3	1	传动轴轴承压盖
20	GB/T3452.1-92	O型橡胶密封圈115 $\times$ 3.55	1	传动轴隔套
21	JB/T(6142.1-4)-92	锥密封棉线编织胶管总成15/M30 $\times$ 2-1500	1	冷却器部位
22	JB/T(6142.1-4)-92	锥密封棉线编织胶管总成15/M30 $\times$ 2-1500	1	冷却器部位
23	GB/T11544-1997	三角带SPB-3150	4	选粉机
24	GB/T11544-1997	三角带25N-4320	11	主机电动机
25		衬板	1	
26		大锥齿轮	1	主机齿轮箱内
27		小锥齿轮	1	主机传动轴上
28		铲刀刃	5	
29		铲刀座	5	
30		磨辊部件	5	
31		橡胶套	10	
32		磨辊	5	
33		磨辊轴	5	
34		横担轴	5	
35		磨环	1	
36		风机叶轮	1	
37		铲刀架下盘	1	
38		压盖	4	
39		选粉机叶片	120	
40		风道护板	12	
41		弹簧拉轴	5	
42		弹簧	5	

序号	国标号	名称	数量	备注
43		横担轴垫	10	
44		磨辊套	5	
45		横担轴套	10	
46		垫片	15	磨辊部件密封
47		磨辊套上压盖	5	
48		小锥齿轮	1	选粉机油池
49		大锥齿轮	1	选粉机油池
50		密封垫片	3	主轴上端
51		铰座	1	
52		磨辊螺母	10	
53		磨辊吊架	1	
54		压轴盖	10	

## 8. Type and Number of Wearing Parts

Tear and Wear Parts for MTW110 as Follow

NO	National Standard	Name	Qty	Notes
01	GB/T288-94	Self-aligning roller bearing 23034CC/W33( $\Phi 170 \times \Phi 260 \times 67$ )	1	Upper end of main shaft
02	GB/T288-94	Self-aligning roller bearing 22324CC( $\Phi 120 \times \Phi 260 \times 86$ )	1	Lower end of main shaft
03	GB/T301-95	Thrust ball bearing 51328( $\Phi 140 \times \Phi 240 \times 80$ )	1	Lowest end of main shaft
04	GB/T297-94	Conical roller bearing 32315( $\Phi 75 \times \Phi 160 \times 58$ )	4	Upper end of roller
05	GB/T288-94	Self-aligning roller bearing 22319CC( $\Phi 95 \times \Phi 200 \times 67$ )	4	Lower end of roller
06	GB/T297-94	Conical roller bearing 30315( $\Phi 75 \times \Phi 160 \times 40$ )	1	Upper end of separator
07	GB/T297-94	Conical roller bearing 30312( $\Phi 60 \times \Phi 130 \times 33.5$ )	1	Lower end of separator
08	GB/T276-94	Deep groove ball bearing 6310( $\Phi 50 \times \Phi 110 \times 27$ )	1	Horizontal axle of separator(inner)
09	GB/T281-94	Self-aligning ball bearing 1311K( $\Phi 55 \times \Phi 120 \times 29$ )	1	Horizontal axle of separator(outer)
10	GB/T288-94	Self-aligning roller bearing 22316CC/W33( $\Phi 80 \times \Phi 170 \times 58$ )	2	Blower
11	GB/T297-94	Conical roller bearing 32216( $\Phi 80 \times \Phi 140 \times 35$ )	2	Drive shaft parts
12	GB/T283-94	Cylindrical roller bearing NF2317M( $\Phi 85 \times \Phi 180 \times 60$ )	1	Drive shaft parts
13	GB9877.1-88	Framework oil seal(FB $\Phi 180 \times \Phi 210 \times 15$ )	1	Upper end of main shaft
14	GB9877.1-88	Framework oil seal(B $\Phi 100 \times \Phi 125 \times 12$ )	2	Drive shaft pans
15	GB9877.1-88	Framework oil seal(B $\Phi 80 \times \Phi 100 \times 10$ )	4	Upper end of roller
16	GB9877.1-88	Framework oil seal(B $\Phi 105 \times \Phi 130 \times 12$ )	8	Lower end of roller
17	GB/T3452.1-92	O-shaped rubber sealing ring 307 $\times$ 5.3	1	Bearing sleeve
18	GB/T3452.1-92	O-shaped rubber sealing ring 250 $\times$ 5.3	1	Lower end of main shaft
19	GB/T3452.1-92	O-shaped rubber sealing ring 77.5 $\times$ 3.55	1	Upper end of drive shaft
20	JB/T(6142.1-4)-92	Textile braiding rubber hose assembly sealing cone 10M24 $\times$ 1.5-800	1	Cooler
21	JB/T(6142.1-4)-92	Textile braiding rubber hose assembly sealing cone 10M24 $\times$ 1.5-500	1	Cooler
22	GB/T11544-1997	Cone belt SPB-2800	4	Separator
23	GB/T11544-1997	Cone belt C-3150	6	Motor for blower

NO	National Standard	Name	Qty	Notes
24	GB/T11544-1997	V-belt 15N-3000	11	Motor for main frame
25		Lining board	1	
26		Big cone gear	1	Gear box of mainframe
27		Small cone gear	1	Drive shaft of mainframe
28		Shovel	4	
29		Shovel seat	4	
30		Roller parts	4	
31		Rubber sleeve	8	
32		Roller	4	
33		Roller shaft	4	
34		Horizontal shaft	4	
35		Ring	1	
36		Impeller of blower	1	
37		Chassis of shovel frame	1	
38		Cover	4	
39		Vane of separator	80	
40		Guard plate	10	
41		Draw rod	4	
42		Spring	4	
43		Horizontal shaft pad	8	
44		Roller sleeve	4	
45		Horizontal shaft sleeve	8	
46		Gasket	12	Roller parts seal
47		Upper cover of roller sleeve	4	
48		Small cone gear	1	Oil tank of separator
49		Big cone gear	1	Oil tank of separator
50		Gasket	3	Upper end of main shaft
51		Hoisting holder	1	
52		Roller nut	8	
53		Roller hanger	1	
54		Cover	8	

**Tear and Wear Parts for MTW 138 as Follow**

NO	National Standard	Name	Qty	Notes
01	GB/T288-94	Self-aligning roller bearing 23044CC/W33( $\phi 220 \times \phi 340 \times 90$ )	1	Upper end of main shaft
02	GB/T288-94	Self-aligning roller bearing 2232goc( $\phi 40 \times \phi 300 \times 102$ )	1	Lower end of main shaft
03	GB/T301-95	Thrustball bearing 51334( $\phi 170 \times \phi 280 \times 87$ )	1	Lowest end of main shaft
04	GB/T297-94	Tapered roller bearing 32319( $\phi 95 \times \phi 200 \times 71.5$ )	4	Upper end of roller
05	GB/T288-94	Self-aligning roller bearing 22326CC( $\phi 130 \times \phi 280 \times 93$ )	4	Lower end of roller
06	GB/T297-94	Tapered roller bearing 30315( $\phi 75 \times \phi 160 \times 40$ )	1	Upper end of separator
07	GB/T297-94	Tapered roller bearing 30312( $\phi 60 \times \phi 130 \times 33.5$ )	1	Lower end of separator
08	GB/T276-94	Deep groove ball bearing 6310( $\phi 50 \times \phi 110 \times 27$ )	1	Horizontal axle of separator(inner)

NO	National Standard	Name	Qty	Notes
09	GB/T281-94	Self-aligning ball bearing 1311K( $\phi 55 \times \phi 120 \times 291$ )	1	Horizontal axle of separator(outer)
10	GB/T288-94	Self-aligning roller bearing 22320CC/W33( $\phi 100 \times \phi 215 \times 73$ )	2	Blower
11	GB/T297-94	Tapered roller bearing 32220( $\phi 100 \times \phi 180 \times 49$ )	2	Drive shaft pans
12	GB/T283-94	Cylindrical roller bearing NF2320M( $\phi 100 \times \phi 215 \times 73$ )	1	Drive shaft pans
13	GB9877.1-88	Framework oil seal(FB $\phi 250 \times \phi 290 \times 15$ )	1	Upper end of main shaft
14	GB9877.1-88	Framework oil seal(B $\phi 120 \times \phi 150 \times 12$ )	2	Drive shaft parts
15	GB9877.1-88	Framework oil seal(B $\phi 110 \times \phi 140 \times 12$ )	4	Upper end of roller
16	GB9877.1-88	Framework oil seal(B $\phi 140 \times \phi 170 \times 15$ )	8	Lower end of roller
17	GB/T3452.1-92	O-sealing ring 365 $\times$ 5.3	1	Bearing sleeve
18	GB/T3452.1-92	O-sealing ring 290 $\times$ 5.3	1	Lower end of main shaft
19	GB/T3452.1-92	O-sealing ring 97.5 $\times$ 5.3	1	Upper end of drive shaft bushing
20	JB/T(6142.1-4)-92	Rubber seal assembly 15/M30 $\times$ 2-1500	1	Cooler
21	JB/T(6142.1-4)-92	Rubber seal assembly 15/M30 $\times$ 2-1500	1	Cooler
22	GB/T11544-1997	V-belt SPB-3510	4	Separator
23	GB/T11544-1997	V-belt SPC-3510	10	Motor for blower
24	GB/T11544-1997	V-belt 25N-3600	8	Motor for main frame
25		Felt ring	8	Lower cover of roller
26		Lining board	1	
27		Big cone gear	1	Gear box of mainframe
28		Small cone gear	1	Upper end of mainframe's drive shaft
29		Shovel	4	
30		Shovel seat	4	
31		Roller pans	4	
32		Rubber sleeve	8	
33		Roller	4	
34		Roller shaft	4	
35		Horizontal shaft	4	
36		Ring	1	
37		Impeller of blower	1	
38		Chassis of shovel frame	1	
39		Cover	4	
40		Vane of separator	90	
41		Guard plate	12	
42		Draw rod	4	
43		Spring	4	
44		Horizontal shaft pad	8	
45		Roller sleeve	4	
46		Horizontal shaft sleeve	8	
47		Gasket	12	Sealing for roller parts
48		Upper cover of roller sleeve	4	
49		Small cone gear	1	Oil tank of separator
50		Big cone gear	1	Oil tank of separator
51		Gasket	3	Upper end of main shaft

NO	National Standard	Name	Qty	Notes
52		Hoisting holder	1	
53		Roller nut	8	
54		Roller hanger	1	
55		Cover	8	

**Tear and Wear Parts for MTW110 as follow**

NO	National Standard	Name	Qty	Notes
01	GB/T288-94	Self-aligning roller bearing 23052( $\phi 260 \times \phi 400 \times 104$ )	1	Upper end of main shaft
02	GB/T288-94	Self-aligning roller bearing 22338( $\phi 190 \times \phi 400 \times 132$ )	1	Lower end of main shaft
03	GB/T301-95	Thrust ball bearing 51344( $\phi 220 \times \phi 360 \times 112$ )	1	Lowest end of main shaft
04	GB/T297-94	Tapered roller bearing 32322( $\phi 110 \times \phi 240 \times 84.5$ )	4	Upper end of roller
05	GB/T288-94	Self-aligning roller bearing 22328CC( $\phi 140 \times \phi 300 \times 102$ )	4	Lower end of roller
06	GB/T297-94	Tapered roller bearing 30318( $\phi 90 \times \phi 190 \times 67.5$ )	1	Upper end of separator
07	GB/T297-94	Tapered roller bearing 30316( $\phi 80 \times \phi 170 \times 60$ )	1	Lower end of separator
08	GB/T276-94	Deep groove ball bearing 6416( $\phi 80 \times \phi 200 \times 48$ )	1	Horizontal axle of separator(inner)
09	GB/T288-94	Self-aligning ball bearing 22316CC/W33( $\phi 80 \times \phi 170 \times 58$ )	1	Horizontal axle of separator(outer)
10	GB/T288-94	Self-aligning roller bearing 22324CC/W33( $\phi 100 \times \phi 215 \times 73$ )	2	Blower
11	GB/T288-94	Tapered roller bearing 23226( $\phi 130 \times \phi 230 \times 80$ )	1	Drive shaft pans
12	GB/T297-94	Cylindrical roller bearing 32224( $\phi 120 \times \phi 215 \times 61.5$ )	2	Drive shaft pans
13	GB9877.1-88	Oil seal(FB $\phi 280 \times \phi 320 \times 20$ )	1	Upper end of main shaft
14	GB9877.1-88	Oil seal(B $\phi 150 \times \phi 180 \times 15$ )	2	Drive shaft pans
15	GB9877.1-88	Oil seal(FB $\phi 120 \times \phi 150 \times 12$ )	5	Upper end of roller
16	GB9877.1-88	Oil seal(FB $\phi 150 \times \phi 180 \times 15$ )	10	Lower end of roller
17	GB/T3452.1-92	O-sealing ring 462 $\times$ 7	1	Bearing sleeve
18	GB/T3452.1-92	O-sealing ring 387 $\times$ 7	1	Lower end of main shaft
19	GB/T3452.1-92	O-sealing ring 200 $\times$ 5.3	1	Upper end of drive shaft bushing
20	GB/T3452.1-92	O-sealing ring 115 $\times$ 3.55	1	Drive shaft distance bushing
21	JB/T(6142.1-4)-92	Rubber seal assembly 15/M30 $\times$ 2-1500	1	Cooler
22	JB/T(6142.1-4)-92	Rubber seal assembly 15/M30 $\times$ 2-1500	1	Cooler
23	GB/T1544-1997	V-belt SPB-3150	4	Separator
24	GB/T1544-1997	V-belt 25N-4320	11	Motor for mainframe
25		Lining board	1	
26		Big cone gear	1	Gear box of mainframe
27		Small cone gear	1	Upper end of mainframe's drive shaft
28		Shovel	5	
29		Shovel seat	5	
30		Roller parts	5	
31		Rubber sleeve	10	
32		Roller	5	
33		Roller shaft	5	
34		Horizontal shaft	5	
35		Ring	1	
36		Impeller of blower	1	

NO	National Standard	Name	Qty	Notes
37		Chassis of shovel frame	1	Sealing for roller parts
38		Cover	4	Oil tank of separator
39		Vane of separator	120	Oil tank of separator
40		Guard plate	12	Upper end of main shaft
41		Draw rod	5	
42		Spring	5	
43		Horizontal shaft pad	10	
44		Roller sleeve	5	
45		Horizontal shaft sleeve	10	
46		Gasket	15	
47		Upper cover of roller sleeve	5	
48		Small cone gear	1	
49		Big cone gear	1	
50		Gasket	3	
51		Hoisting holder	1	
52		Roller nut	10	
53		Roller hanger	1	
54		Cover	10	

Note: 1. Tear and wear parts are not in the guaranty limitation. 2. See drawing 15 to find the spare parts position.

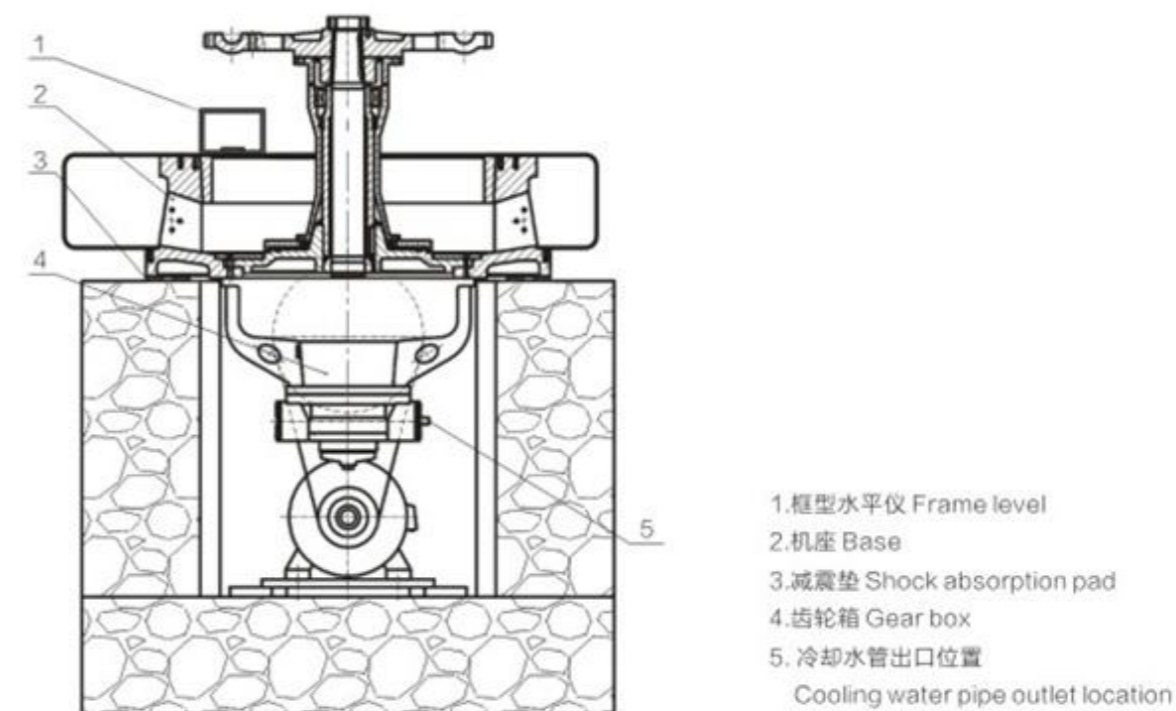
**十一、附图(本册图示仅供参考, 具体以实物为准)**


图1: 磨机安装示意图  
 Diagram 1: Installation of grinding mill

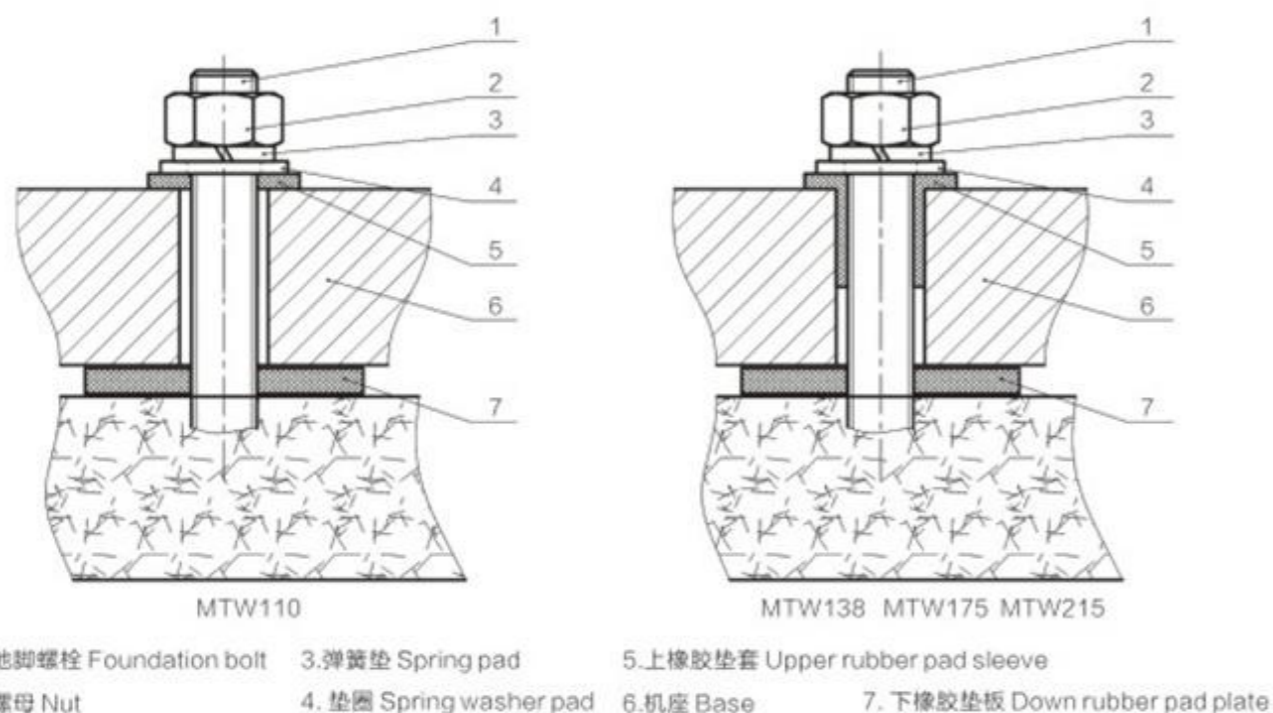


图2：安装防震橡胶垫套及下橡胶垫板示意图

Diagram 2: Installation of shockproof upper rubber pad sleeve and down rubber pad plate

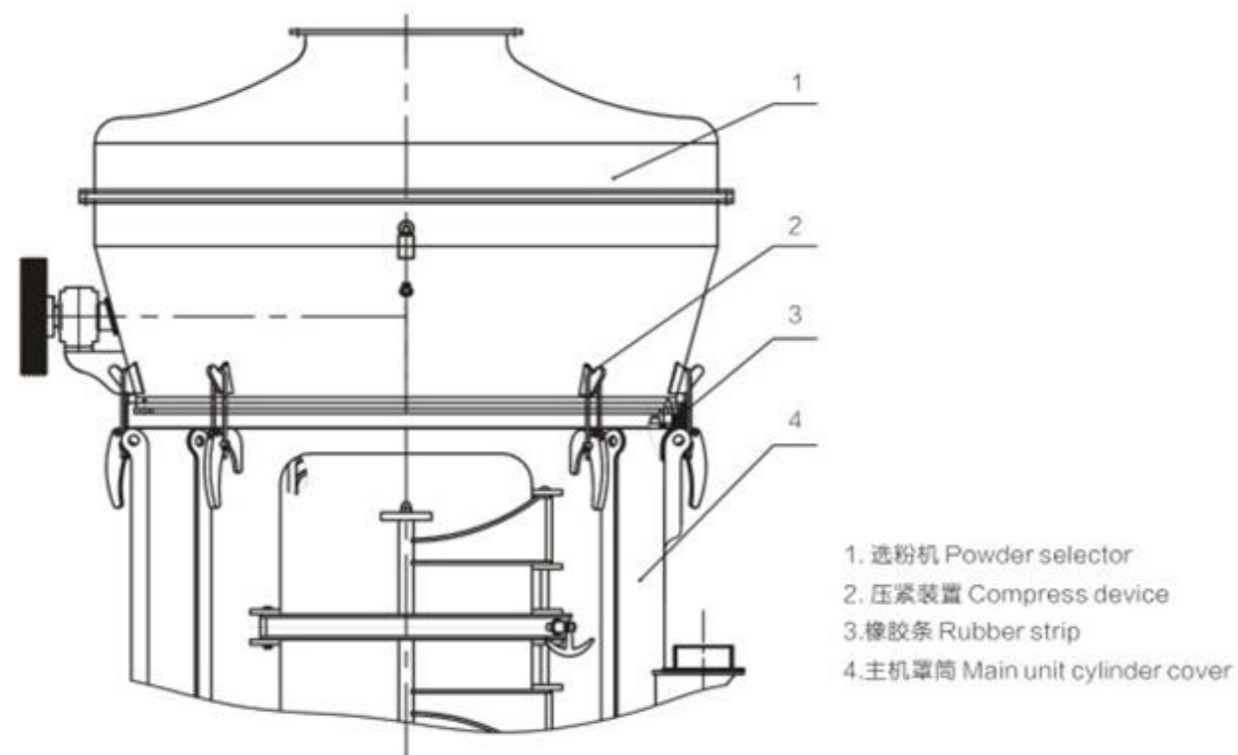


图3：选粉机安装调整示意图

Diagram 3: Installation and adjustment of powder separator

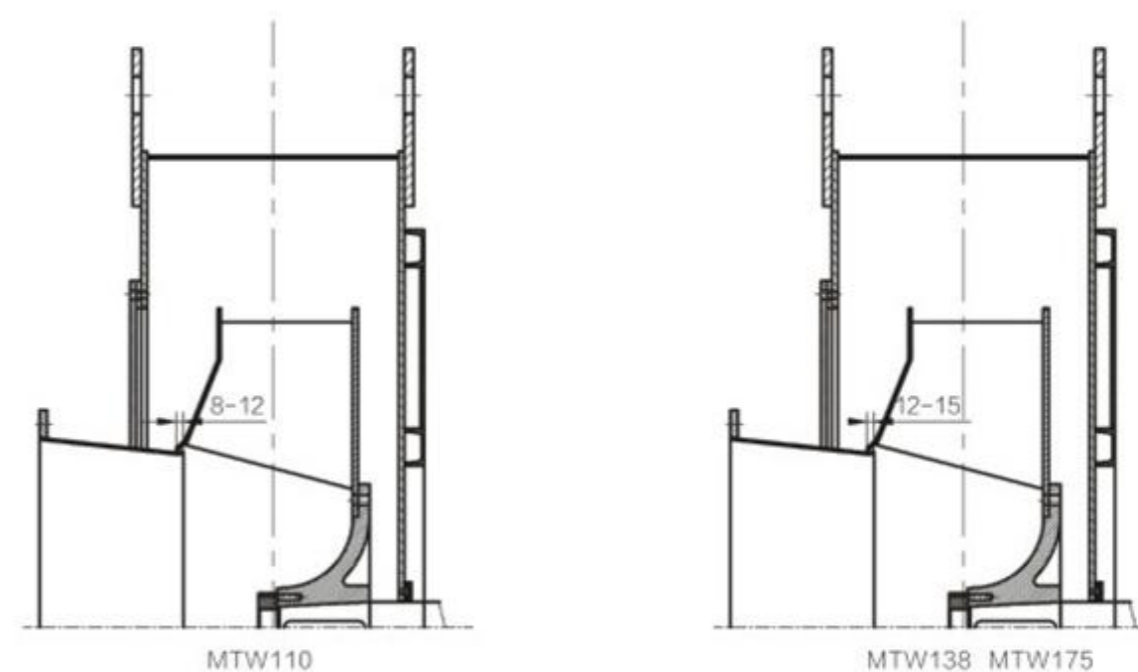


图4：风机安装示意图

Diagram 4: Installation of blower

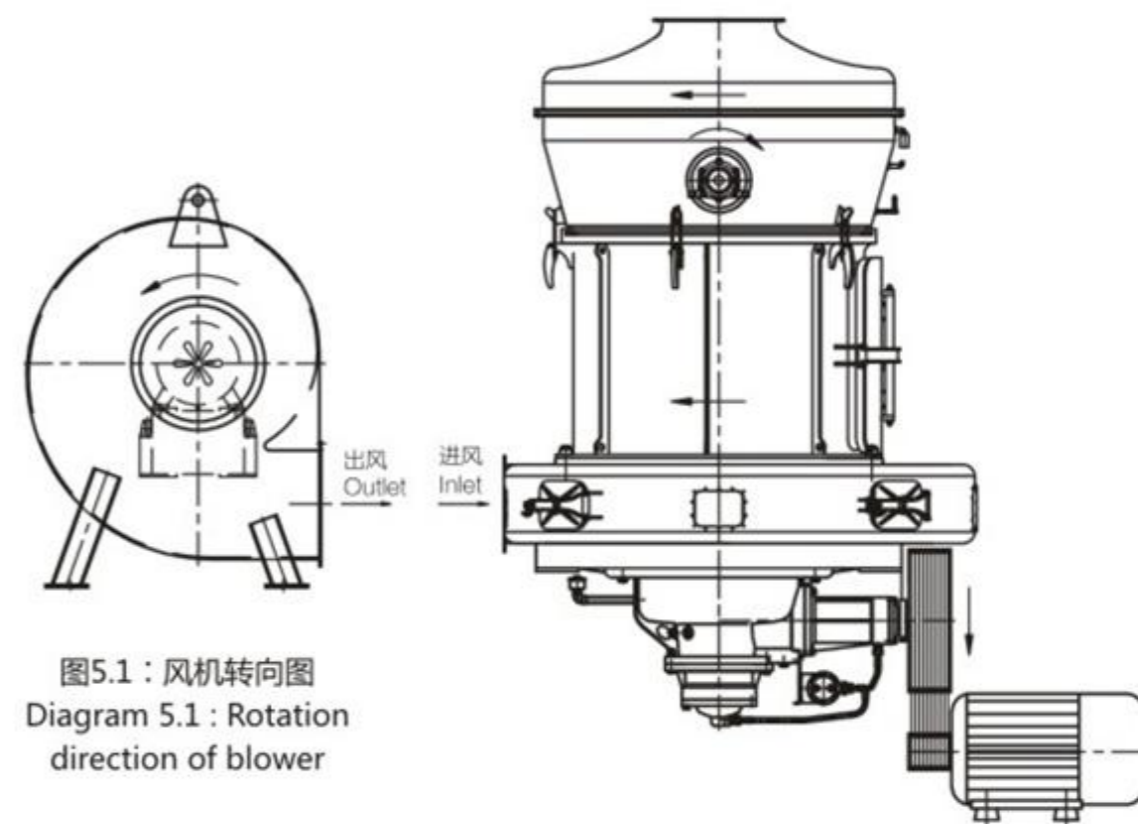
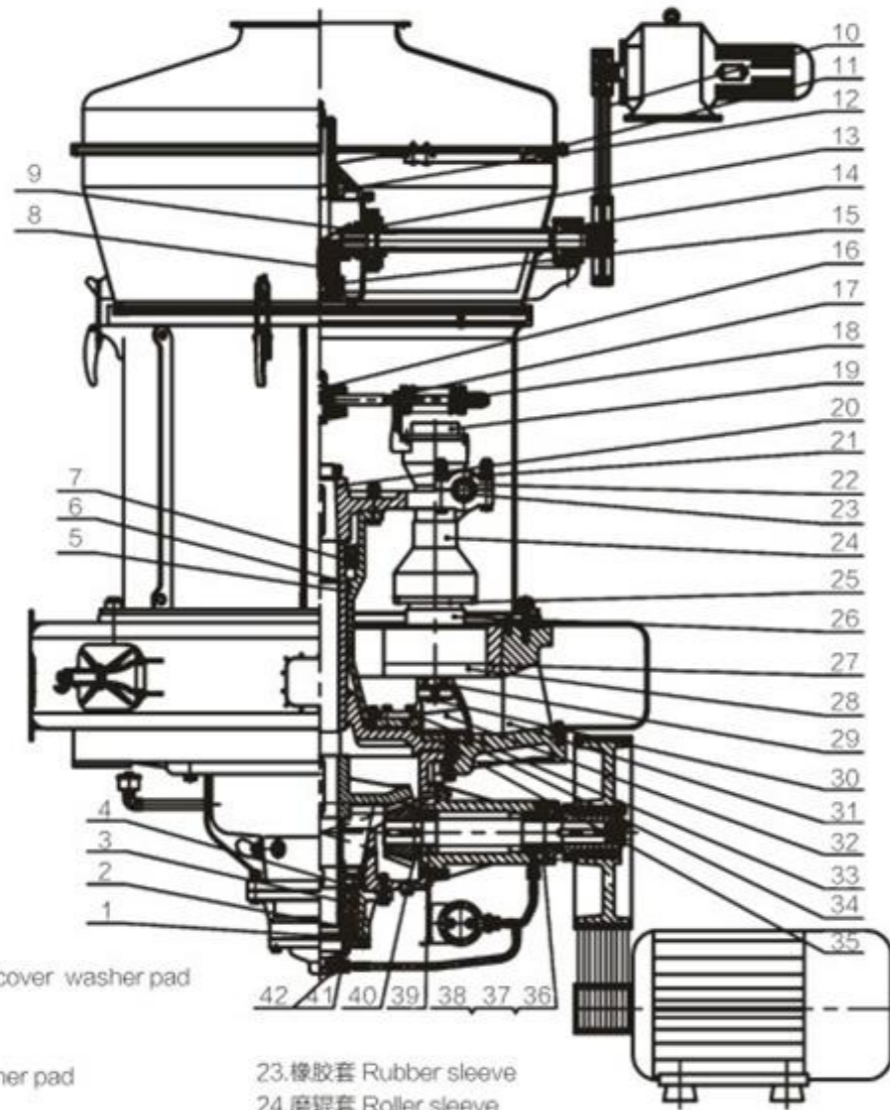


图5.1：风机转向图

Diagram 5.1: Rotation direction of blower

图5.2：主机、选粉机转向图

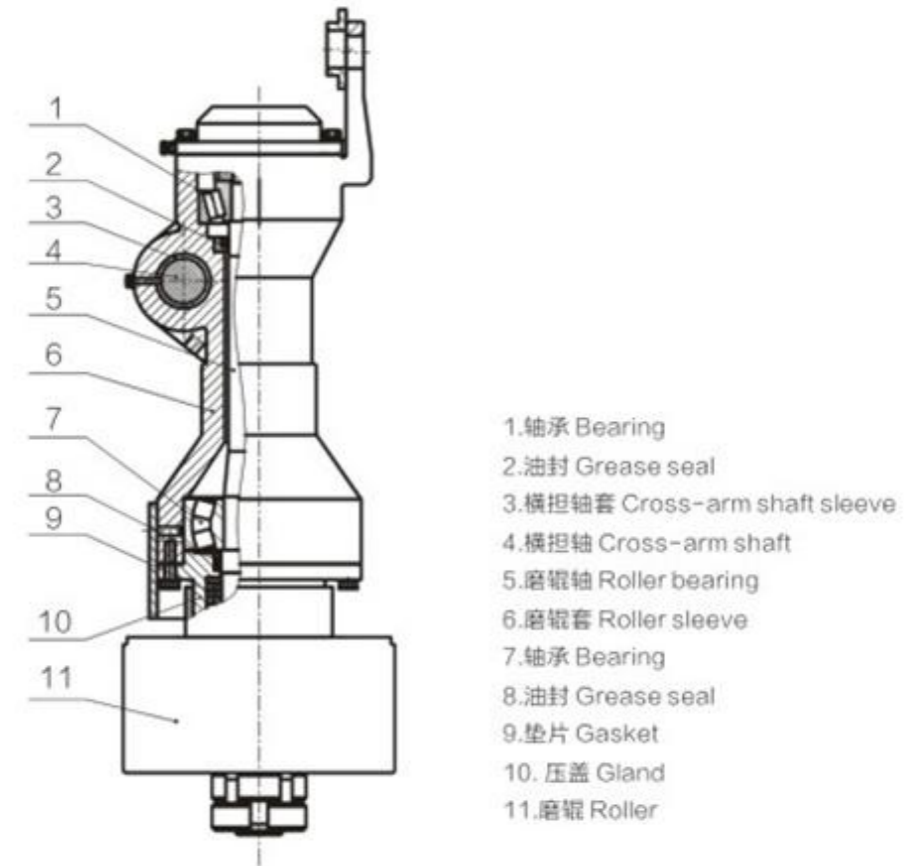
Diagram 5.2: Rotation of main unit and powder separator



- |   |  |
|---|--|
| 1.主轴下端盖 上型圈 Spindle bottom cover washer pad                                       | 23.橡胶套 Rubber sleeve                             |
| 2.轴承 Bearing  | 24.磨辊套 Roller sleeve                             |
| 3.轴承 Bearing  | 25.压盖, 垫片 Gland, Gasket                          |
| 4.轴承套上型圈 Bearing sleeve washer pad  | 26.衬套 Bush                                       |
| 5.密封垫片 Gasket seal  | 27.磨环 Ring                                       |
| 6.主轴上端油封 Spindle upper grease seal  | 28.磨辊 Roller                                     |
| 7.轴承 Bearing  | 29.磨辊螺母 Roller screw nut                         |
| 8.大锥齿轮 Large bevel gear   | 30.磨辊轴 Roller bearing                            |
| 9.小锥齿轮 Small bevel gear   | 31.风道护板 Panels of wind panels                    |
| 10.三角带 V-belt   | 32.铲刀刃 Shavel edge                               |
| 11.选粉机叶片 Powder selector blade  | 33.铲刀座 Shavel seat                               |
| 12.轴承 Bearing   | 34.衬板 Liner plates                               |
| 13.轴承 Bearing   | 35.铲刀架下盘 Shavel frame bottom plate               |
| 14.轴承 Bearing   | 36.轴承 Bearing                                    |
| 15.轴承 Bearing   | 37.轴承 Bearing                                    |
| 16.铰座 Hinge block   | 38.传动轴上油封 Transmission shaft upper grease seal   |
| 17.弹簧 Spring  | 39.传动轴隔套 型圈 Transmission shaft spacer washer pad |
| 18.弹簧拉轴 Spring pulling bearing  | 40.主机上小锥齿轮 Small bevel gear of main unit         |
| 19.磨辊套上压盖 Roller sleeve upper press cover   | 41.主机上小锥齿轮 Small bevel gear of main unit         |
| 20.磨辊吊架 Roller hanger frame   | 42.胶管总成 Hose assembly                            |
| 21.压轴盖 Finale cover   |  |
| 22.横担轴 横担轴套 横担轴垫<br>Cross-arm shaft Cross-arm shaft sleeve Cross-arm shaft Gasket |  |

图6：主机, 选粉机易损件位置图

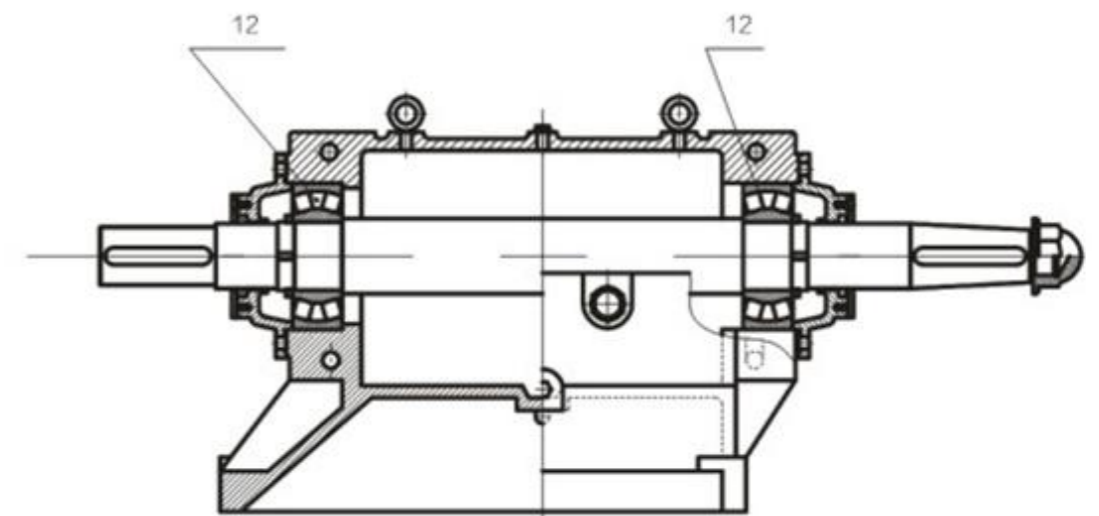
Diagram 6: Wearing parts position of main unit and powder separator



- |                               |
|-------------------------------|
| 1.轴承 Bearing                  |
| 2.油封 Grease seal              |
| 3.横担轴套 Cross-arm shaft sleeve |
| 4.横担轴 Cross-arm shaft         |
| 5.磨辊轴 Roller bearing          |
| 6.磨辊套 Roller sleeve           |
| 7.轴承 Bearing                  |
| 8.油封 Grease seal              |
| 9.垫片 Gasket                   |
| 10.压盖 Gland                   |
| 11.磨辊 Roller                  |

图7：易损件位置图

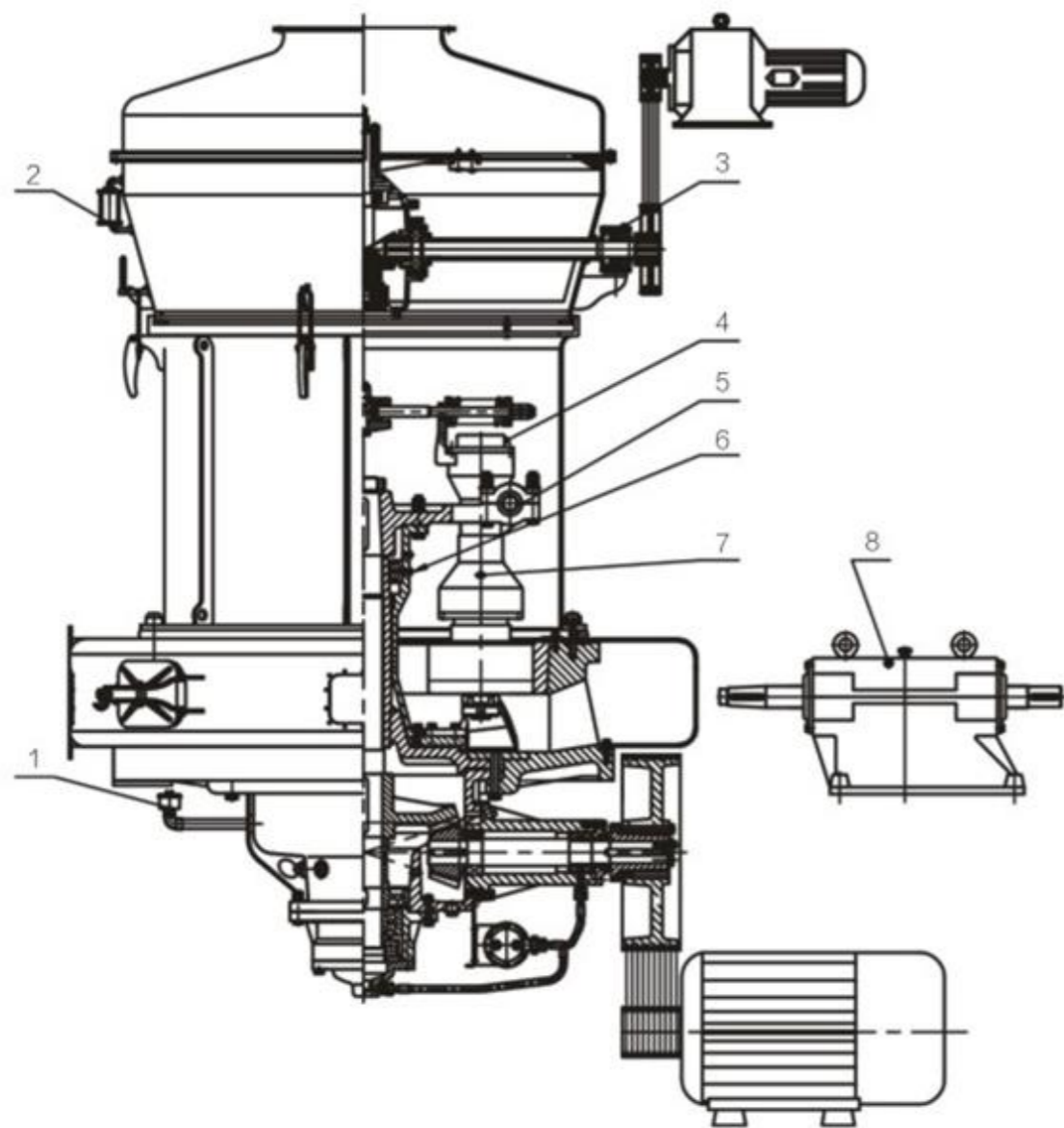
Diagram 7: Wearing parts' position



12.轴承 Bearing

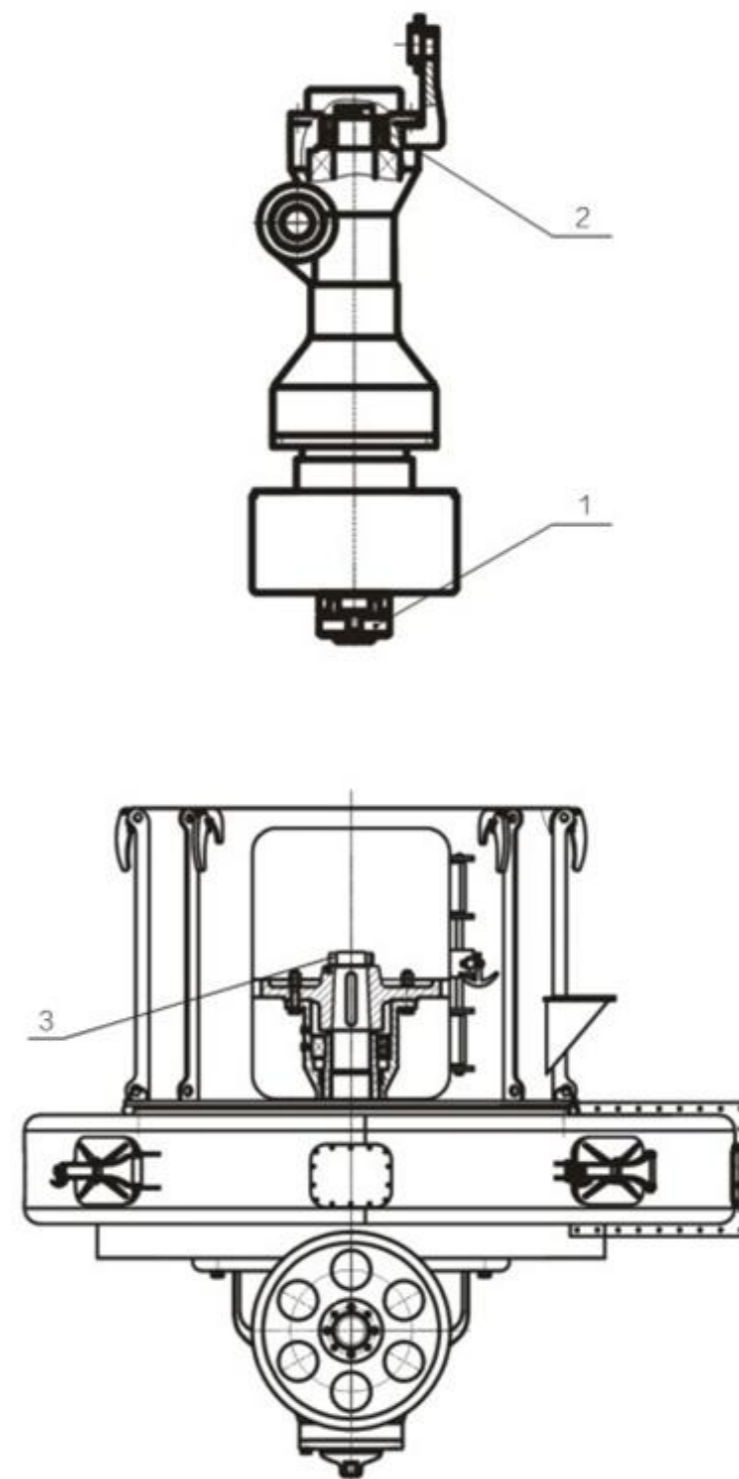
图8：离心引风机轴承座轴承位置图

Diagram 8: Bearing and bearing seat's position of centrifugal fan



序号	1	2	3	4	5	6	7	8	9
名称 Name	主机减速机 加油口 Main unit reducer oil filler	选粉机油油 加油口 Powder selector oil tank oil filler	选粉机 轴承座 Powder selector bearing seat	磨辊上 加油口 Roller upper oil filler	横担轴 加油口 Cross-arm shaft oil filler	主轴上 加油口 Spindle upper oil filler	磨辊下 加油口 Roller lower oil filler	主轴下 加油口 Spindle lower oil filler	风机轴承座 加油口 Blow bearing seat oil filler
润滑油/脂 Lubricating oil / grease	齿轮油 L-CKC-68 Gear oil L-CKC-68	HJ-40 机械油 HJ-40 Engine oil	ZL-1 锂基润滑油 ZL-1 Lithium grease	ZL-1 锂基润滑油 ZL-1 Lithium grease	ZL-1 锂基润滑油 ZL-1 Lithium grease	ZL-1 锂基润滑油 ZL-1 Lithium grease	ZL-1 锂基润滑油 ZL-1 Lithium grease	ZL-1 锂基润滑油 ZL-1 Lithium grease	HJ-40 机械油 HJ-40 Engine oil

图9：主机，选粉机，离心引风机轴承座润滑位置图  
Diagram 9: Bearing seat lubricating position of main unit, powder separator and centrifugal induced fan.



- 1.左旋螺母/磨辊轴最下端 Left-handed nut/bottom of roller bearing
- 2.左旋螺母/磨辊轴最上端 Left-handed nut/upper of roller bearing
- 3.左旋螺母/主轴最上端 Left-handed nut/upper of spindle

图10：磨粉机中使用左旋螺母的位置  
Diagram 10: Left-handed nut position in the grinding mill.

- 1.主轴下端盖 Spindle bottom cover
- 2.轴承 Bearing
- 3.轴承垫 Bearing gasket
- 4.轴承套 Bearing sleeve
- 5.轴承 Bearing
- 6.泵油盘 Pump oil dials
- 7.主轴隔垫 Spindle septa
- 8.大锥齿轮 Large bevel gear
- 9.齿轮箱体 Bevel gear box
- 10.主轴 Spindle
- 11.骨架油封 Skeleton grease seal
- 12.轴承 Bearing
- 13.铲刀架 Shovel frame
- 14.磨辊吊架 Roller hanger frame
- 15.主轴上螺母 Spindle upper nut
- 16.上螺母止退垫 Spindle upper nut washer pad
- 17.衬板 Liner plates
- 18.立式轴承座 Vertical bearing seat
- 19.传动部件 Transmission parts
- 20.胶管总成 Hose assembly
- 21.冷却器 Coolers

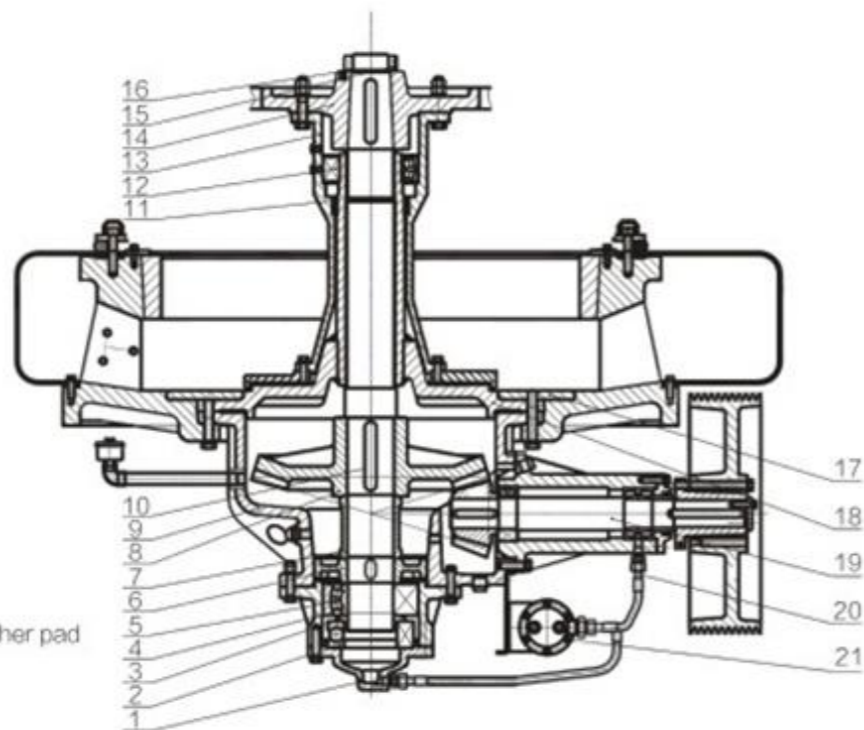


图11：主机齿轮箱及主轴部分拆装简图

Diagram 11: Dismantling and assembly diagram of main unit gear box and spindle parts.

- 1.小锥齿轮 Small bevel gear
- 2.轴承 Bearing
- 3.管堵 Pipe plug
- 4.传动轴 Transmission shaft
- 5.传动轴架 Transmission shaft frame
- 6.轴承 Bearing
- 7.轴承压盖 Bearing press cover
- 8.骨架油封 Skeleton oil seal
- 9.传动轴隔套 Transmission shaft Spacer
- 10.大带轮胀套 Large pulley expansion sleeve
- 11.端压盖 Press cover

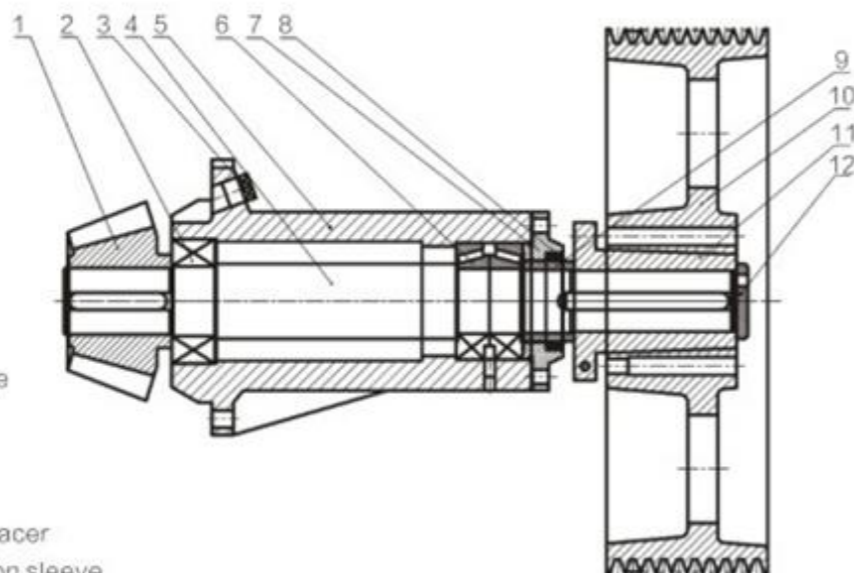
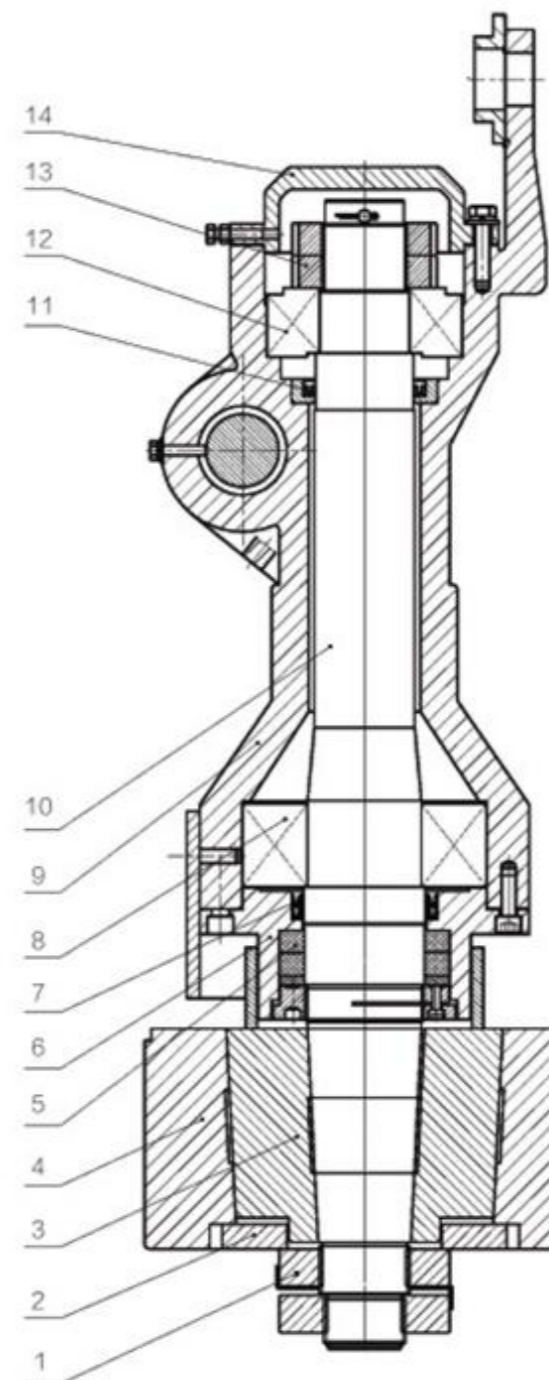


图12：传动轴部件拆装简图

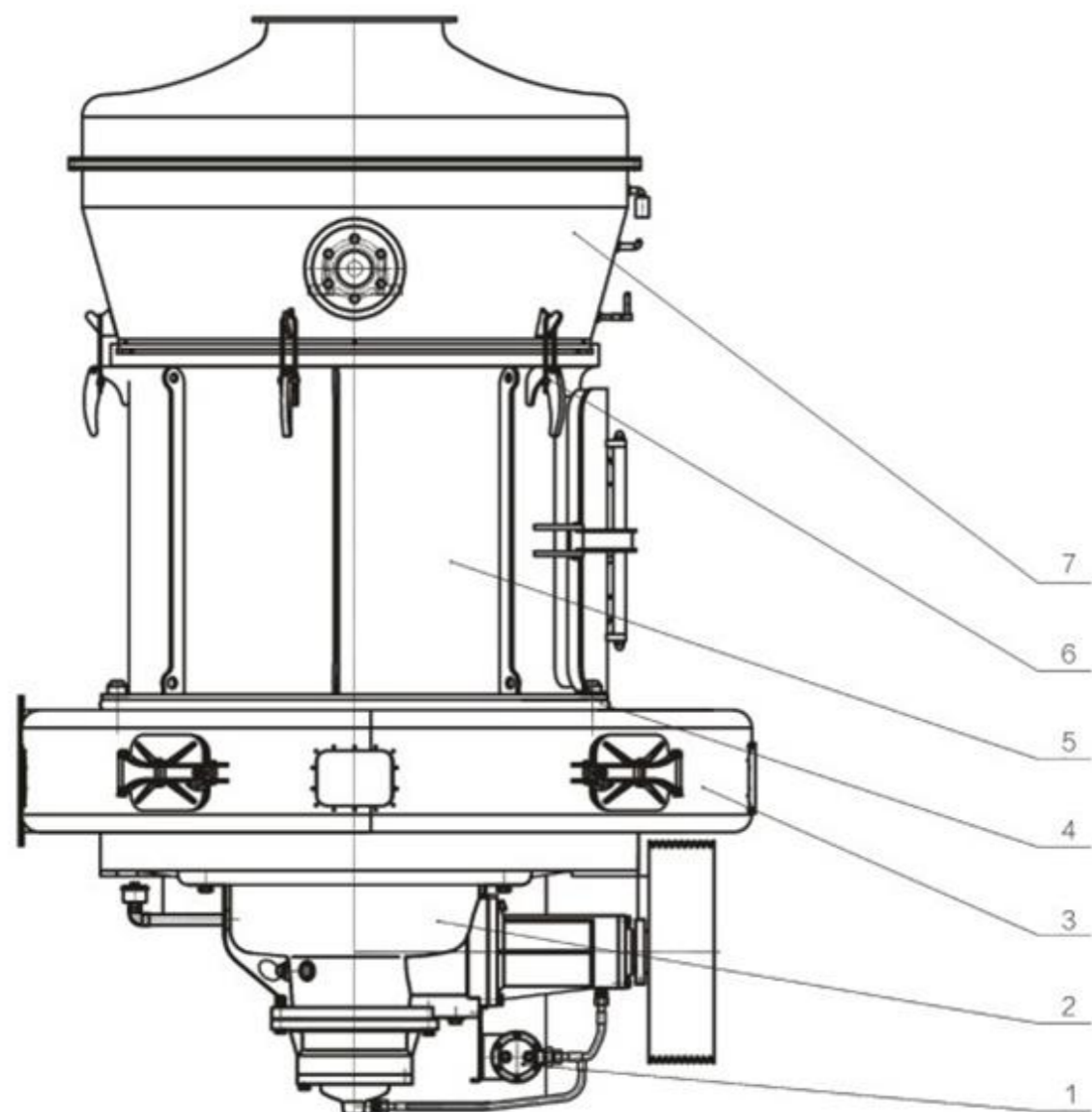
Diagram 12: Dismantling and assembly transmission shaft parts



- 1.磨辊螺母 Roller nut
- 2.磨辊压板 Roller platen
- 3.磨辊芯 Roller core
- 4.磨辊 Roller
- 5.垫片 Gasket
- 6.压盖 Gland
- 7.下端油封 Bottom grease seal
- 8.轴承 Bearing
- 9.磨辊套 Roller sleeve
- 10.磨辊轴 Roller shaft
- 11.上端油封 Upper grease seal
- 12.轴承 Bearing
- 13.磨辊螺母 Roller nut
- 14.磨辊上端盖 Roller upper cover

图13：磨辊部件拆装简图

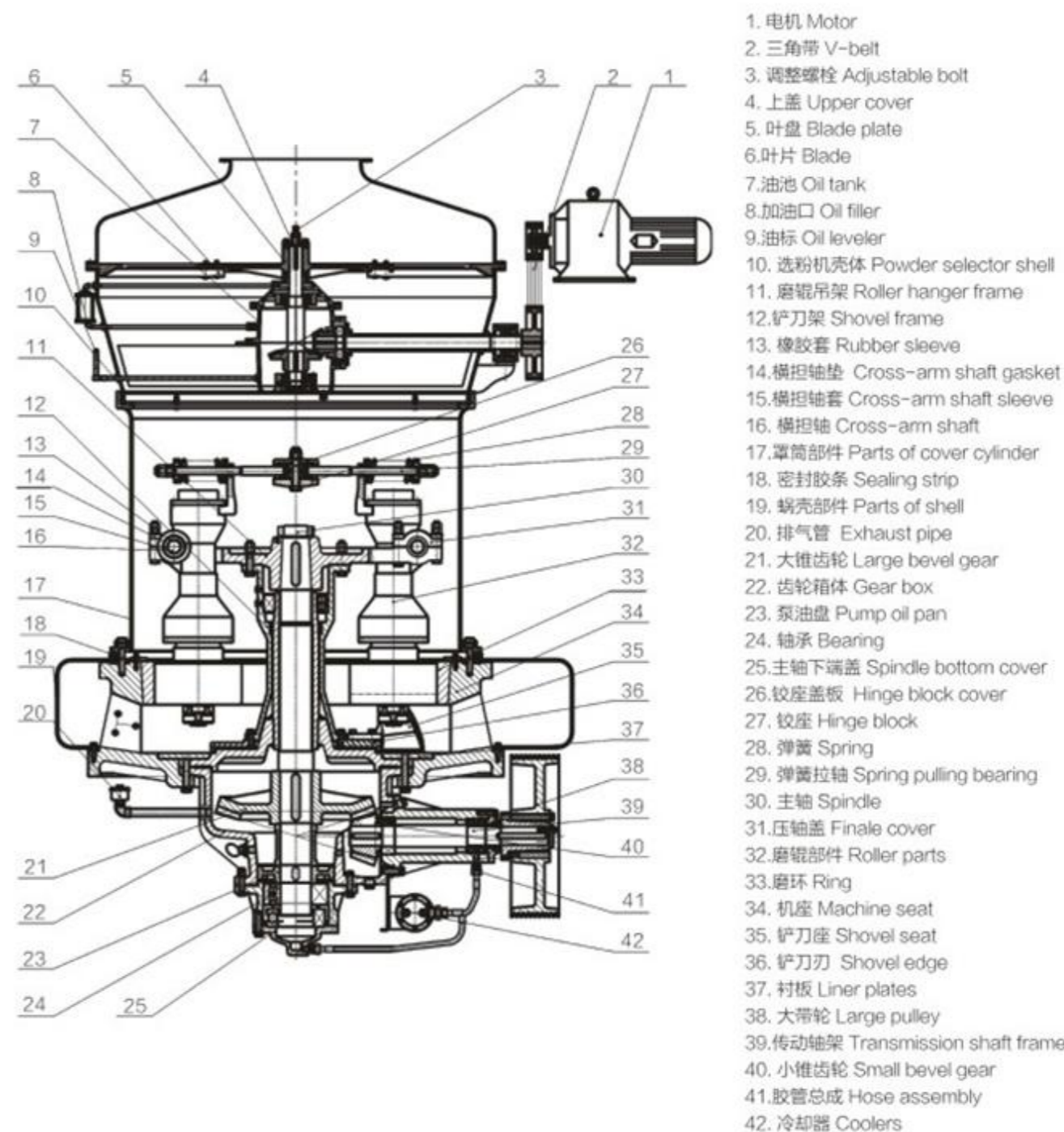
Diagram 13: Dismantling and assembly diagram of roller parts



- 1.含冷却器 Including coolers
- 2.齿轮箱体 Gear box
- 3.进风蜗壳 Air inlet volute
- 4.密封垫 Seal gasket
- 5.主机 Main unit
- 6.压紧装置 Hold-down gear
- 7.选粉机 Powder separator

图14：磨机主机，选粉机，外形简图

Diagram 14: Overall simple graph of grinding mill main unit, powder separator.



1. 电机 Motor
2. 三角带 V-belt
3. 调整螺栓 Adjustable bolt
4. 上盖 Upper cover
5. 叶盘 Blade plate
6. 叶片 Blade
7. 油池 Oil tank
8. 加油口 Oil filler
9. 油标 Oil leveler
10. 选粉机壳体 Powder selector shell
11. 磨辊吊架 Roller hanger frame
12. 铲刀架 Shovel frame
13. 橡胶套 Rubber sleeve
14. 横担轴垫 Cross-arm shaft gasket
15. 横担轴套 Cross-arm shaft sleeve
16. 横担轴 Cross-arm shaft
17. 罩筒部件 Parts of cover cylinder
18. 密封胶条 Sealing strip
19. 蜗壳部件 Parts of shell
20. 排气管 Exhaust pipe
21. 大锥齿轮 Large bevel gear
22. 齿轮箱体 Gear box
23. 泵油盘 Pump oil pan
24. 轴承 Bearing
25. 主轴下端盖 Spindle bottom cover
26. 铰座盖板 Hinge block cover
27. 铰座 Hinge block
28. 弹簧 Spring
29. 弹簧拉轴 Spring pulling bearing
30. 主轴 Spindle
31. 压轴盖 Finale cover
32. 磨辊部件 Roller parts
33. 磨环 Ring
34. 机座 Machine seat
35. 铲刀座 Shovel seat
36. 铲刀刃 Shovel edge
37. 衬板 Liner plates
38. 大带轮 Large pulley
39. 传动轴架 Transmission shaft frame
40. 小锥齿轮 Small bevel gear
41. 胶管总成 Hose assembly
42. 冷却器 Coolers

图15：欧版磨主机，选粉机，结构简图

Diagram 15: Structure simple graph of MTW grinding mill main unit and powder separator.