

# G213

Model SG818

***MANUAL SURFACE GRINDER***

OPERATION MANUAL

**TH-MJ1640**

**Table Size : 400×160mm**

**TOWNHERO MACHINERY CO., LTD.**

**YUNNAN P.R.C**

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- O. Shortcomings of the grinding surface and amending measures

This machine tool has been tested thoroughly and adjusted into permitted tolerances before leaving the factory. For not to damage, be aware of not hitting as that is most important in carrying and installing.

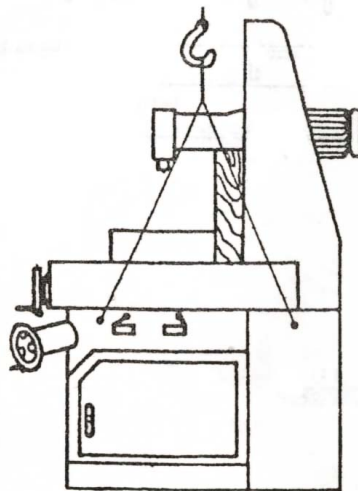
A. Transportation

With using crane, place the machine according to the following.



B. Transportation with lift hook

With using lift hook, sling up the four lift bolts of the base. Be aware of keeping balance.



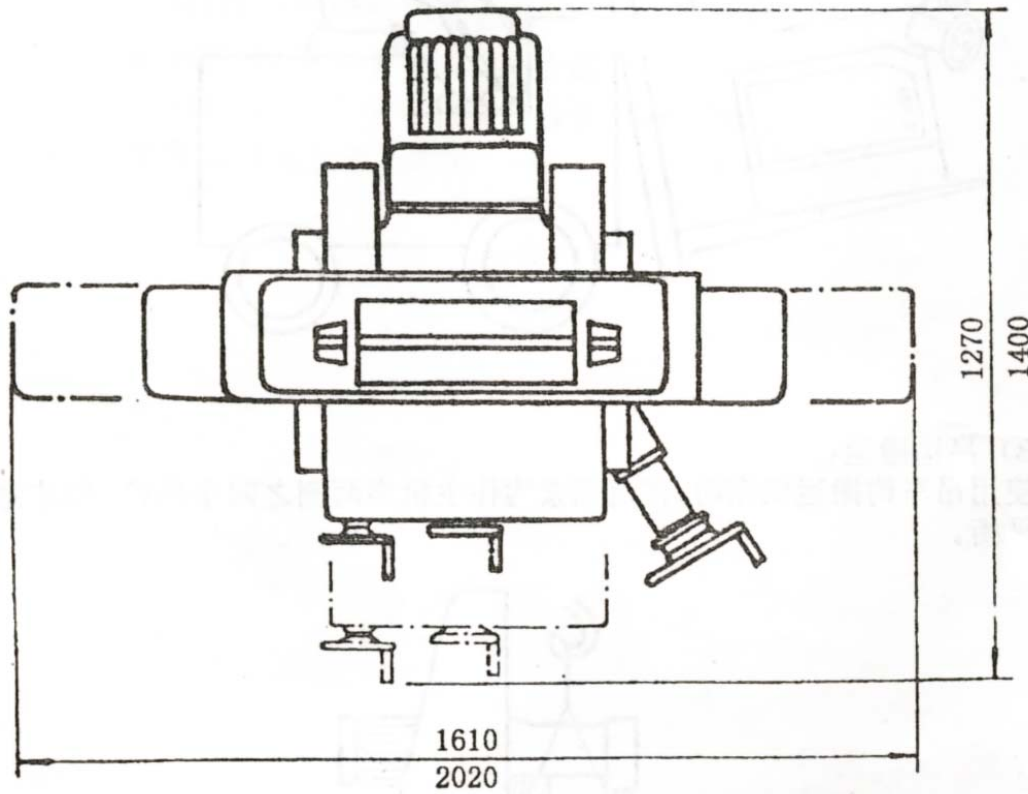
C. Selection of the installing location

The machine and the grinding precision are greatly influenced by the location of machinery installation. As a result, the grinder should be dealt with most careful as well as the boring machine. After all, It is needed to do the most precious working, no matter what kind of grinding machine.

Although grinding machine is usually placed among millers; gear shapers; drillers etc, these arranges don't consider the effect as vibrations; jolts of the other machine tools would transfer to the grinding machine which would make figures by external vibrations.

Don't install the grinding machine on non-consolidated floor, which would make the machine tool out of the shape.

The Occupied Area



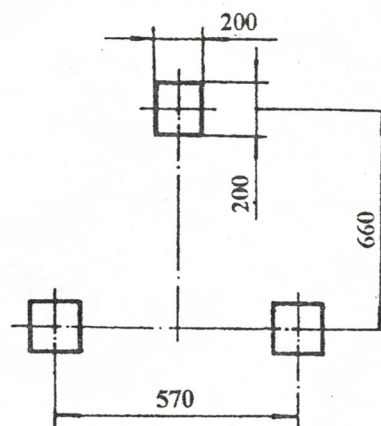
D. Machinery installation

a.) Power consumption

Unit: KW/Hr

Item	Model	TH-MJ1640
Base of the machine		1.1KW
Draining system		0.075KW
Dust collector system		0.37KW
Total		1.545KW

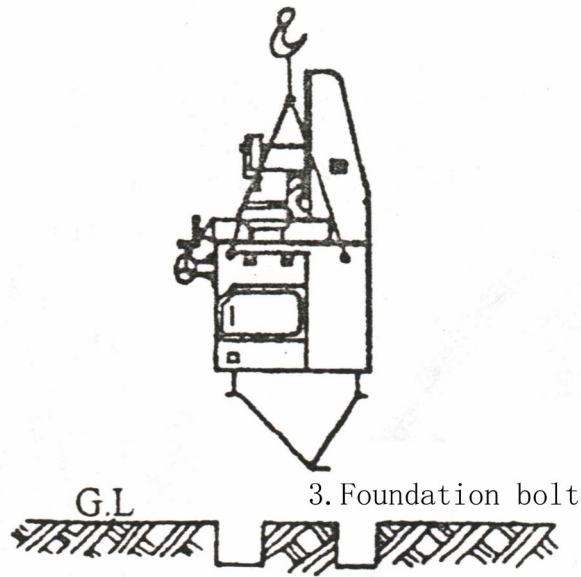
b.) Foundations drawing



(a). Positions of the foundation bolts

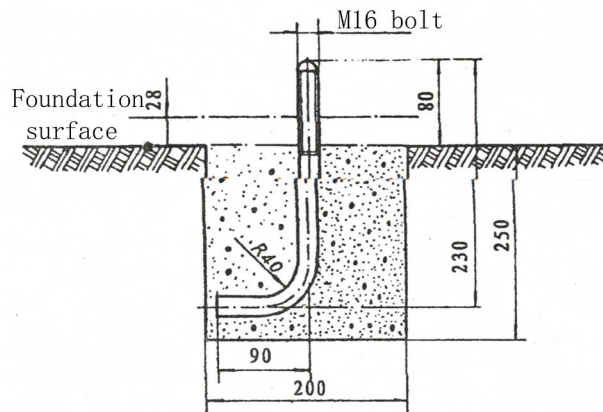
(b). Usage of the "L" shape foundation bolt

Fasten the foundation bolts on the machine tool with nuts, and leave 30mm long screw in air to adjust. Put the machine tool slowly down, let the bolt align the bore. Level the machine with wedges.

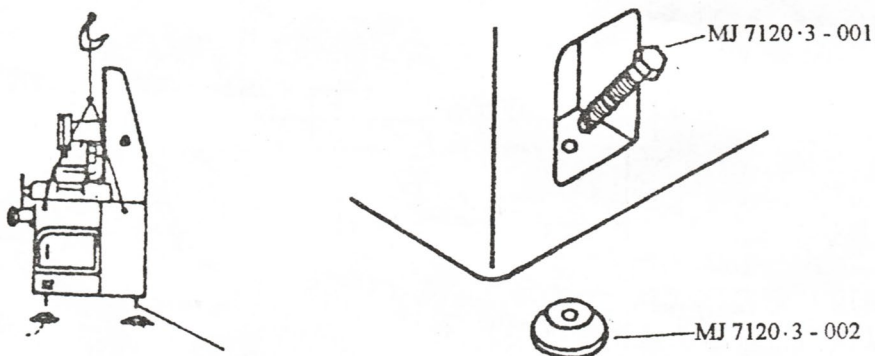


Fill the foundation holes with concrete.

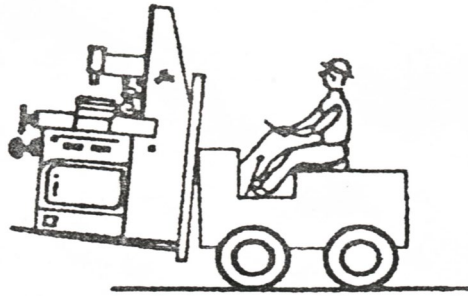
Foundation bolts and dimensions of the holes



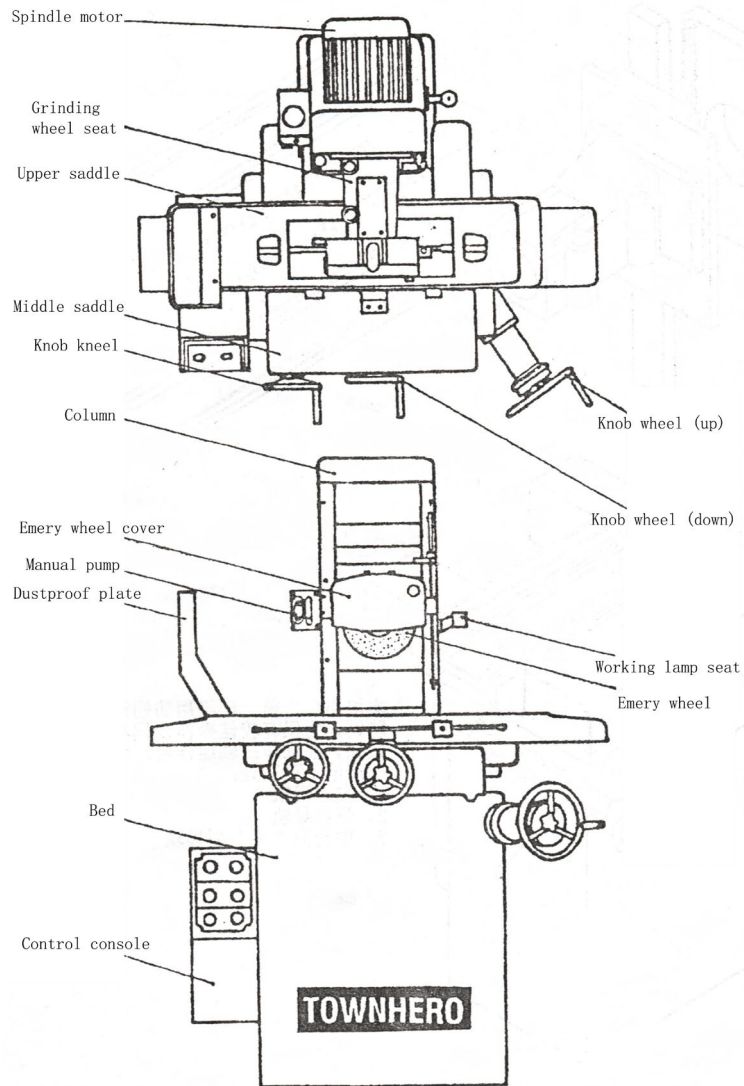
- (c). In case of applying the cushion and screw  
Drive the bolt into the base hole (as illustrated).



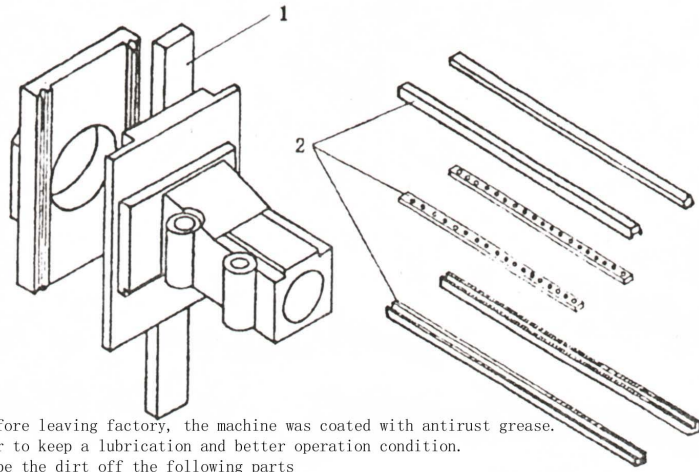
For easier to adjust horizon line more stable, spin the screw as deeper as possible.  
Put the machine tool slowly down place the foundation bolt into the center hole.  
Adjust horizon line of the machine tool.  
Caution: Depart the machine tool from floor as following illustration shown when using crane instead of hoist.



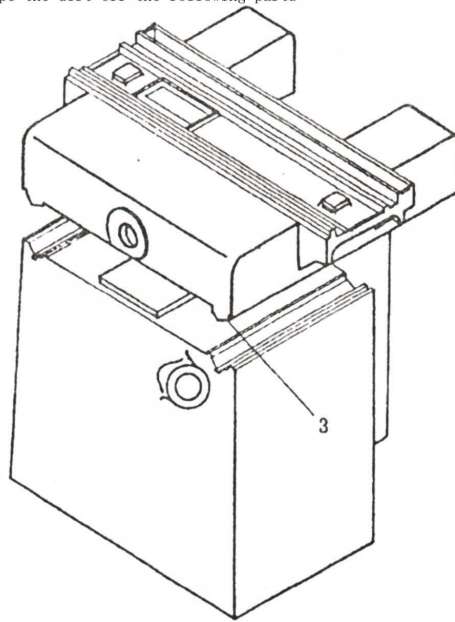
c.) Configurations and the name  
a. TH-MJ1640



d.) Cleaning of the machine



Before leaving factory, the machine was coated with antirust grease.  
 For to keep a lubrication and better operation condition.  
 Wipe the dirt off the following parts

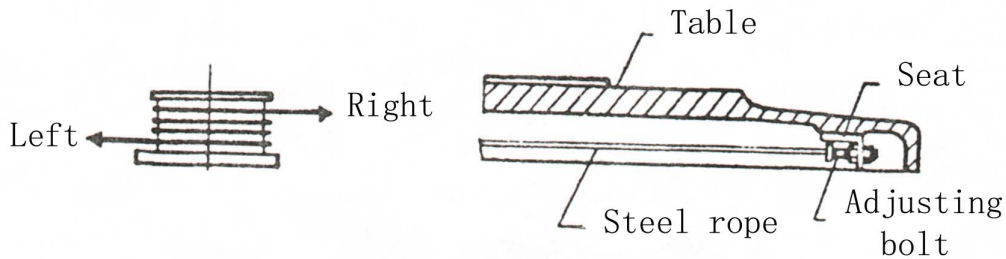


- 1.Sliding track
- 2.Steel-ball guiders
- 3."V" shape guider  
on the middle saddle

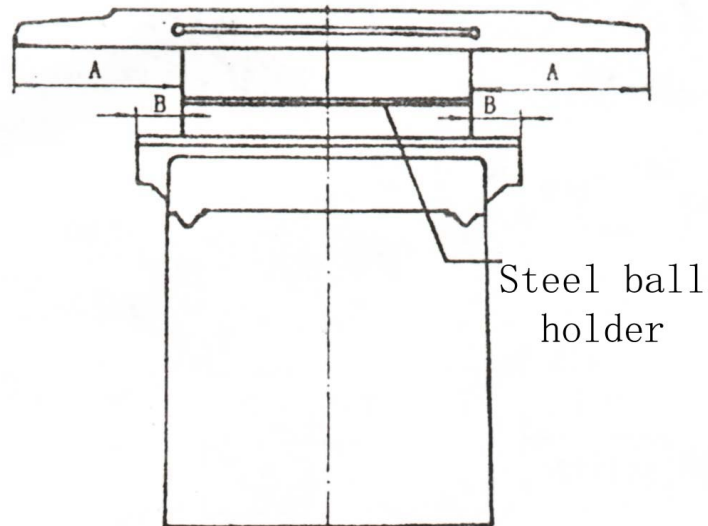
e.) Installation of the table  
 1. Model TH-MJ1640

This machine tool is integral in transporting to protect the sliding tracks, except the worktable. Please install the worktable according to the following steps  
 Manual model:

(1). Wind the steel rope around the wheel axle four circles (as illustrated) and should fasten around the axle temporarily simultaneously.

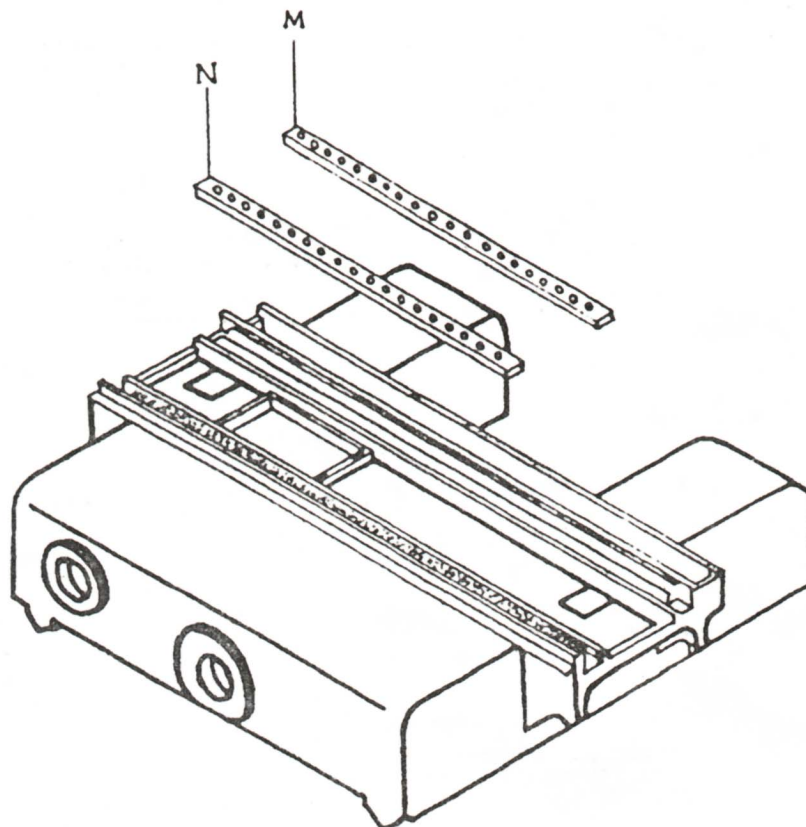


(2). Place the steel balls and the holders on steel ball guiders, a longer rope place on backside, and a shorter place on front side (close to the worker).



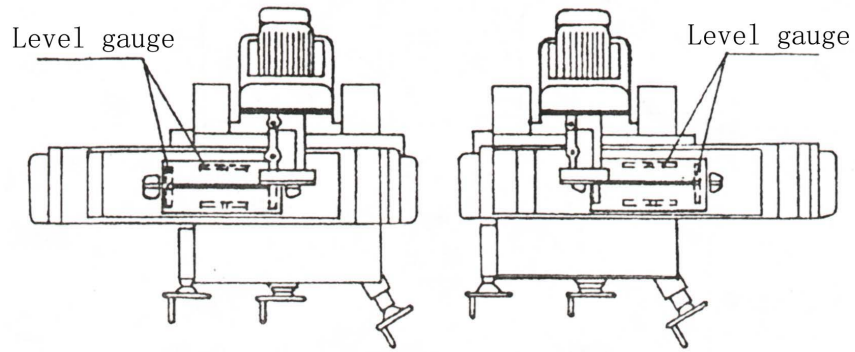
- (3). Lift up the work table, place it on the holder slightly carefully as prevent damaging the steel balls and the sliding tracks
- (4). Set the steel rope in the set-seat under the two ends of the table.
- (5). After a certain period of time, adjust the steel ropes under the table to the correct tightness for the smooth movement of the table.

2. Quantity of the steel ball (table sliding tracks)

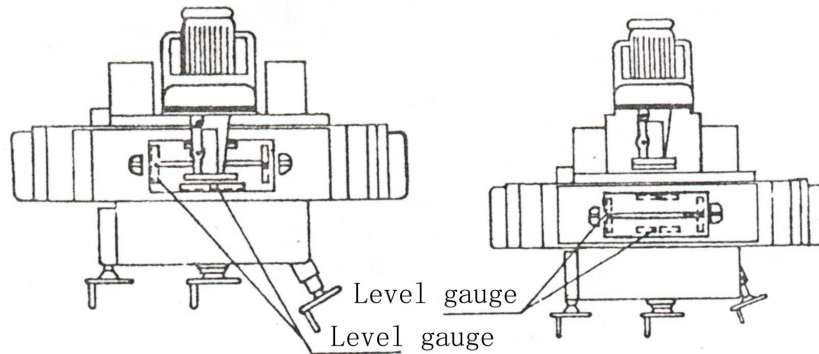


Model	N	M	
TH-MJ1640	19	20	39

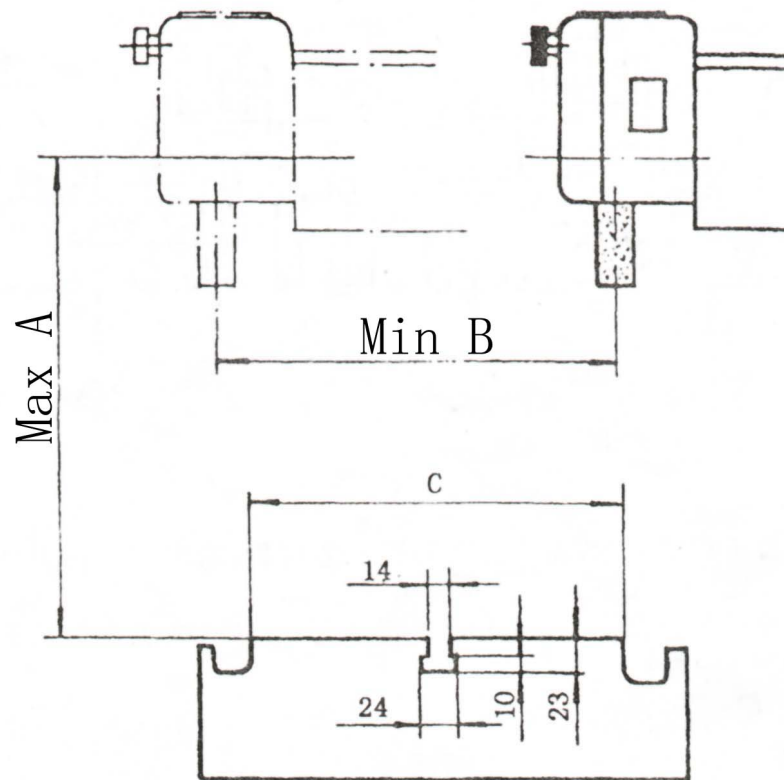
f.) Adjusting procedure for leveling the machine



Level the machine by moving the table that is the left.  
 Level the machine by moving the table that is the right.



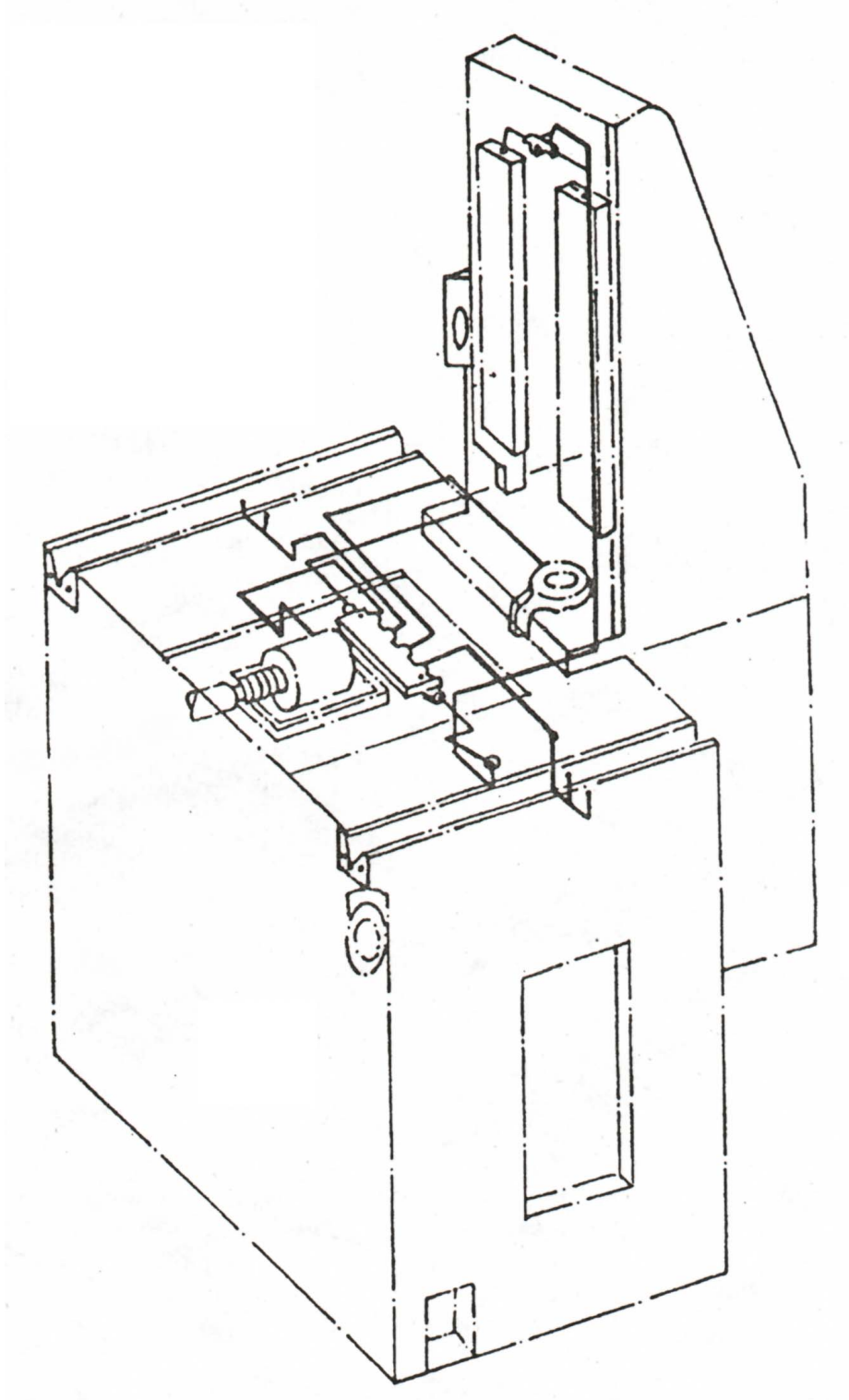
Level the machine by moving the table that is the back  
 Level the machine by moving the table that is the front  
 g.) Table size and the grinding surface area.



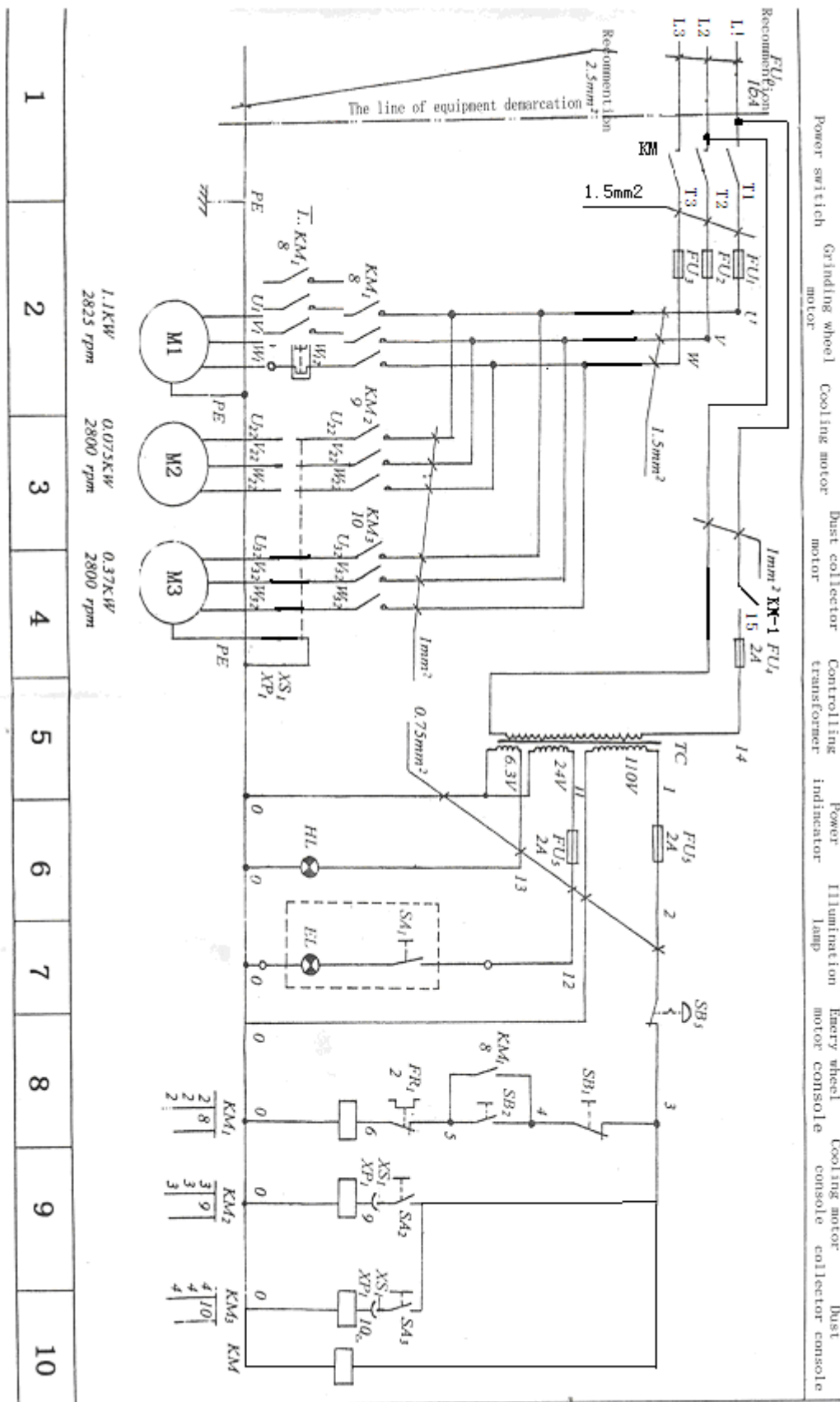
Unit: mm

Model	A	B	C
TH-MJ1640	375	180	160

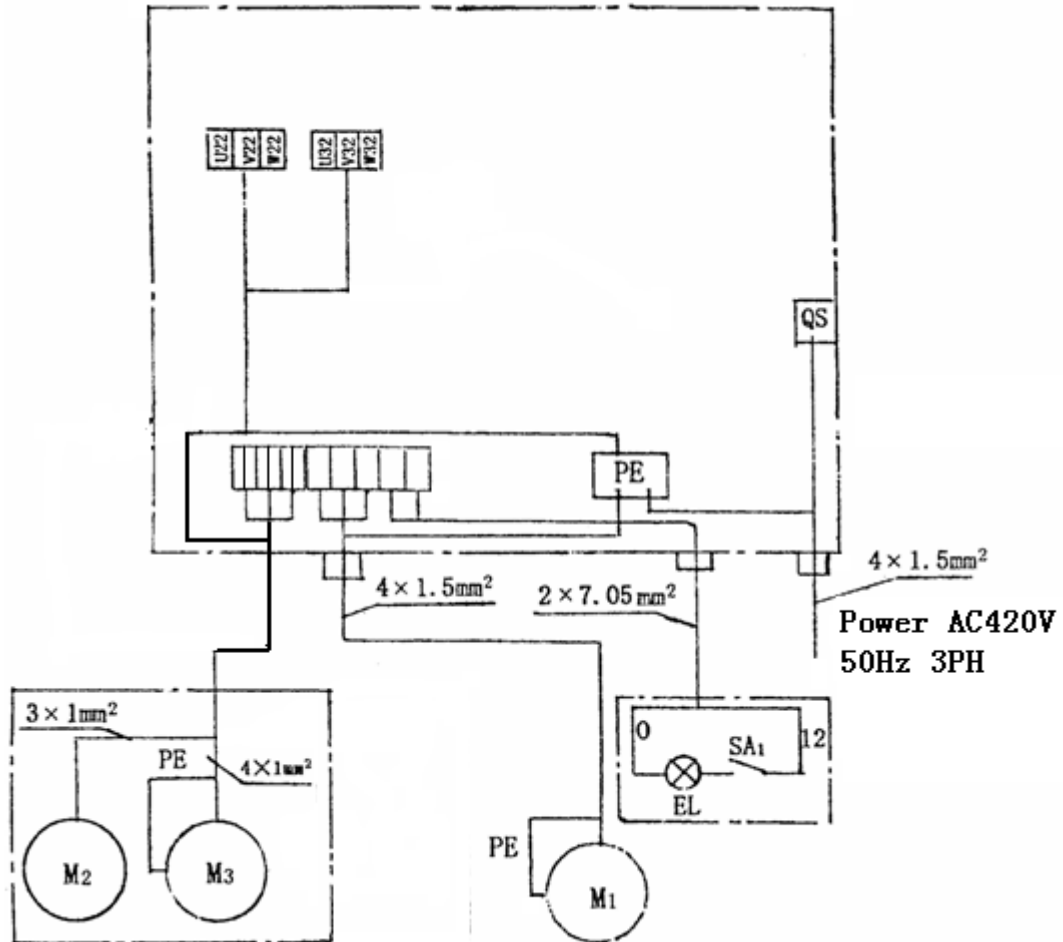
h.) Lubricating system illustration



i.) Electric principle drawing

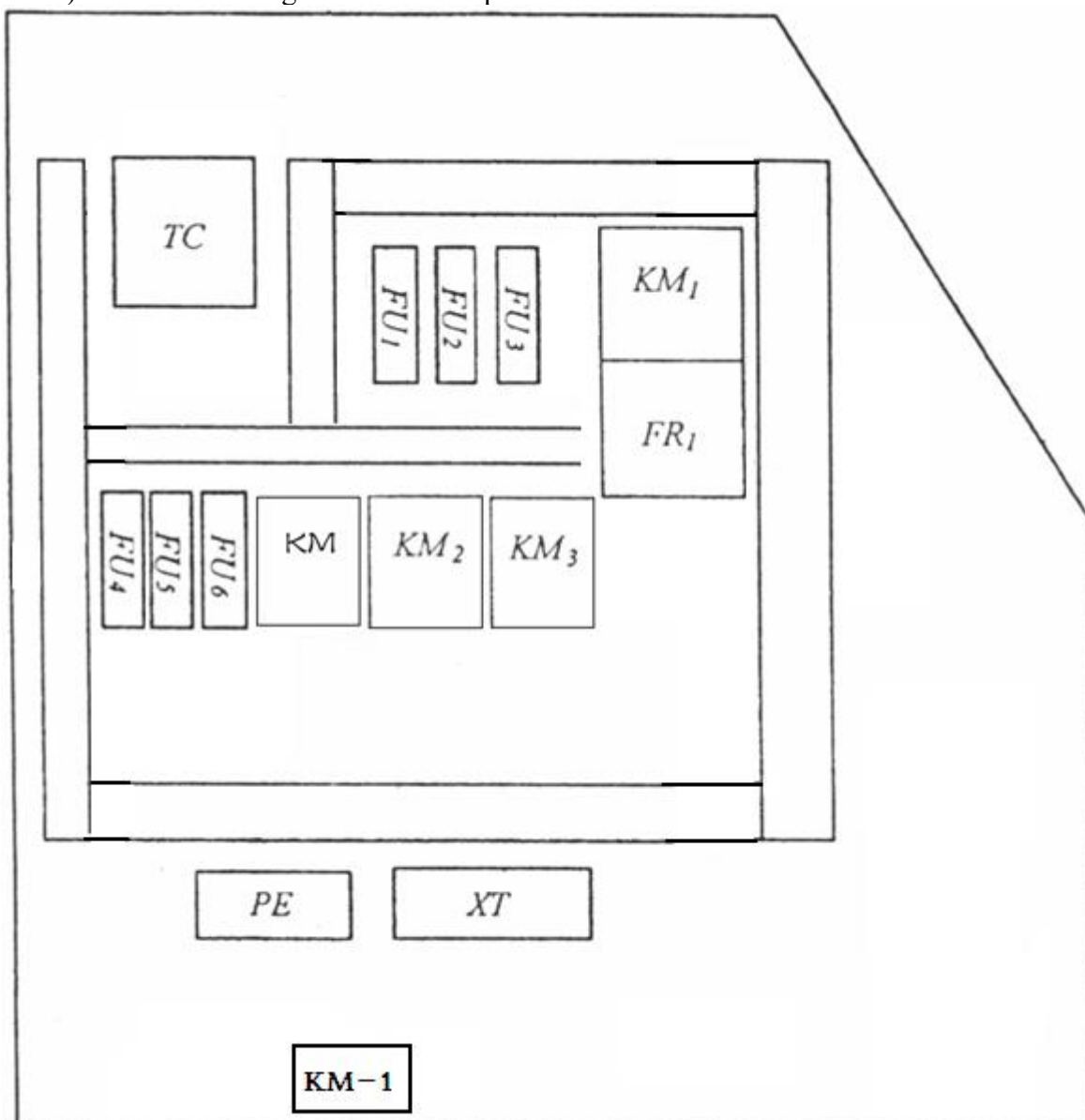


j.) Wiring drawing



XS1			XP1				
No.	Wire No.	No.	Wire No.	No.	Wire No.	No.	Wire No.
1	U22	4	PE	7	W32	10	
2	V22	5	U32	8			
3	W22	6	V32	9			

k.) Location drawing of electric components



### 1.) Detailed list of electric components

Code	Name and usage	Technical specs 380V 50Hz	Quantity	Model
M1	Emery wheel motor	1.1KW 2.5A 2825rpm	1	Y802-2
M2	Cooling motor	40W 0.19A 2800rpm	1	YSB-12
M3	Dust collector motor	0.37KW 0.96A 2800rpm	1	B02-8012
KM	AC contactor switch	Coil voltage 110V	3	CJX2-091 0
KM1-3	AC contactor switch	Coil voltage 110V	3	CJX2-091 0
FR1	Heat relay	Range 1.5-4A Rated 2.5A	1	JR16B-20 D
JC	Control transformer	420V/110V 100VA 2.4V 50VA 6.3V 10VA	1	JBK4-160
FU1-3	Fuse	16A	3	RT18-32
FU4-6	Fuse	4A	3	RT-18-32
HL	Indicator	6.3V White	1	XDY1-B/ 11
EL	Illumination lamp	24V 40W	1	JC15
SB1 SB3	Press button switch	Red	2	LAY3-11
SB5	Press button switch	Red mushroom-like top	1	LAY3-MS/ 18
SA2 SA3	Selector switch	Black	2	LAY3-11
KM-1	Door switch		1	LMK-11
	Lock of the electric control console		1	MS304-1

### m.) Balance the emery wheel

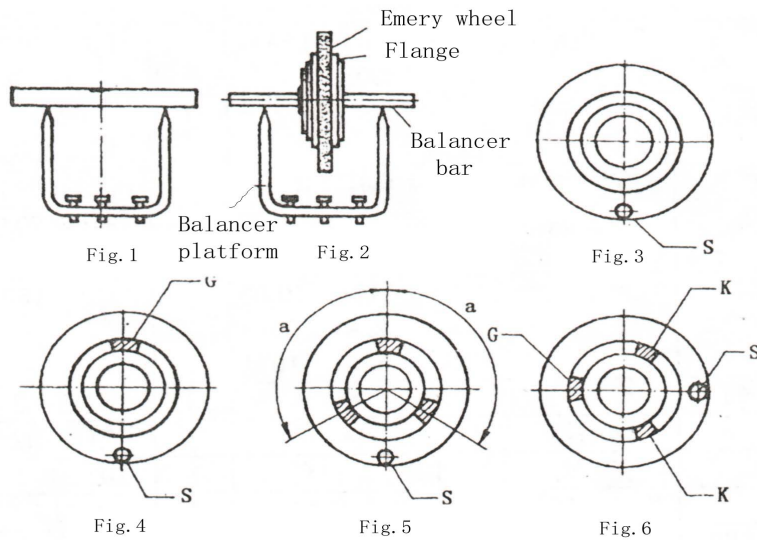
When emery wheel is well balanced, its internal stress will be relieved and higher precision may be obtained.

The precision of grinding, grinding surface, service life of the bearing, the spindle are all concerned with emery wheel.

In general, to attain such a target static equilibrium is enough.

As far as the emery wheel, mount the emery wheel flange and the balancer bar correctly, among which places two parallel blade or balance plat form, and balance according to the following steps (Fig.2)

- 1) The balancer platform should be corrected horizon line firstly.
- 2) Wring the emery wheel on the platform and mark the sign "S" with chalk (Fig.3).
- 3) Fasten the first balancer "G" opposite to "S", be aware of not removing "G".
- 4) Mount the other two balancers any places on the arc with equidistance "a" from "G".
- 5) With rotating 90 degrees each time and check whether balance or not, remove "K" balancer plate until could balance at any position.
- 6) The balanced emery wheel should be trial run in normal speed, five minutes at least.



The primary balanced emery wheel should remount on the spindle and would be trimmed with the parallel trimmer wheel on the spindle front seat or the trimmer on the worktable.

Caution: With applying diamond trimmer on the worktable that should fix with traveling direction, then spin the manual wheel.

The emery wheel should be trimmed into completely accurate what can be confirmed by the grinding surface.

The wheel that balance in mentioned ways should dismount again, place it on the platform, balance carefully, remount on the spindle again and trim the wheel until it is exactly accurate.

The well-balanced emery wheel would occur un-poised for losses yet, so it is necessary examining it regularly and should balance again if it necessary.

The emery wheel could absorb the draining water at the lowest point, so don't turn on the water when the wheel is not running, otherwise the wheel would occur un-balanced appearances as well as the wheel don't idle for a while, and the wheel could resume balance by idling that could remove damp by the centrifugal force.

The wheel should have had a thorough cleaning of the female wheel flange pusher and the spindle pusher, then push the emery wheel on the spindle pusher with hand. Fasten the wheel with the set bolts and nuts.

Dismantle the emery wheel flanks with dismantled screw.

Fig.8 to 10

Common style spindle use fixed screw: M8\*30 hollow-head set screw

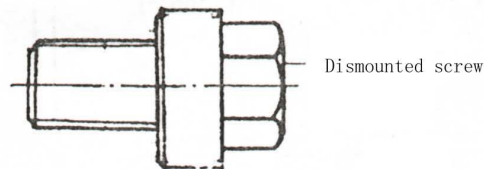


Fig. 8

American style spindle apply

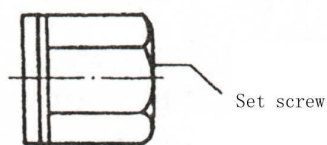


Fig. 9

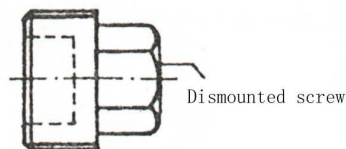


Fig. 10

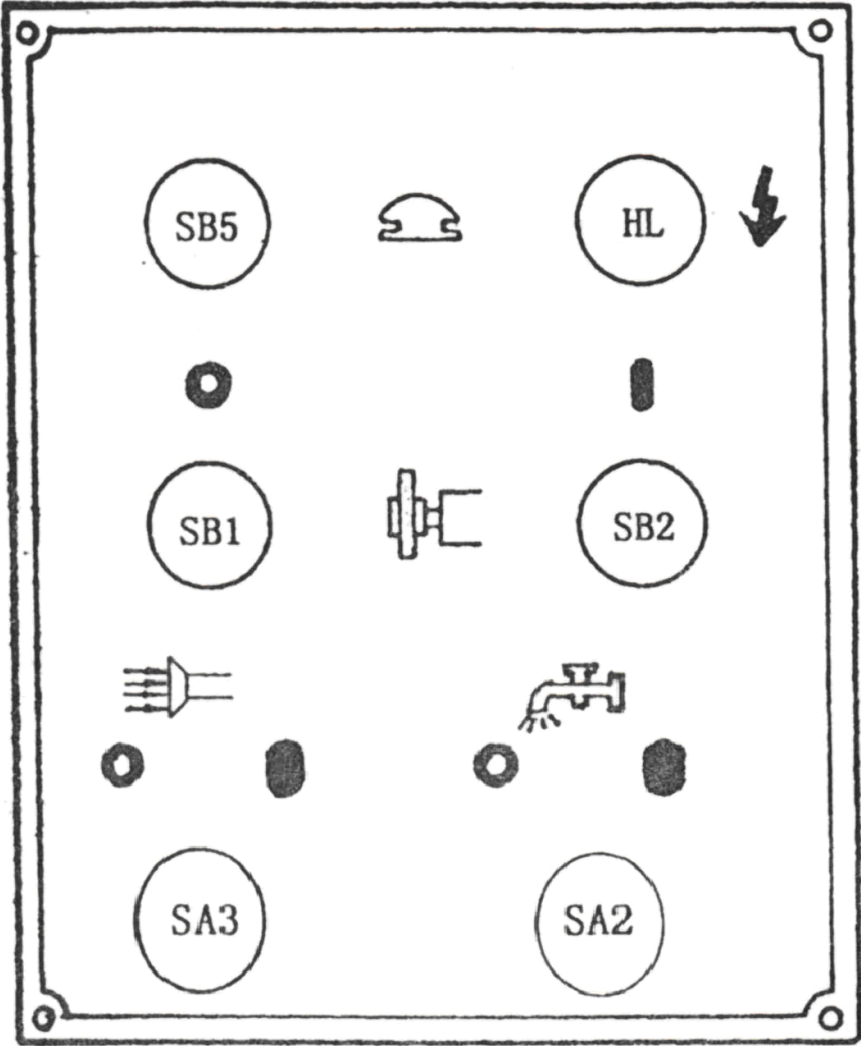
Whether grind different material, change the emery wheel accordingly. Whether dismantle

flange for the replaced emery wheel would don't meet the economic benefit, because would take too much unnecessary time resuming balance and amending.

We recommend that have the special flange for the special wheel what would save up so much time, simplify troubleshooting and meet the economic benefit more.

E. Control console and its directions

(a). TH-MJ1640



- HL: Power indicator
- SB1: Spindle motor “stop” press button
- SB2: Spindle motor “run” press button
- SB3: Dust collector, cooling draining motor “stop” press button
- SB4: Dust collector, cooling draining motor “run” press button
- SB5:”Urgent” “Stop” press button
- SA2: Cooling “run” “stop” optional press button
- SA3: Dust collector “run” “stop” optional press button

F. General grinding terms

The right options of the emery wheel and proper operation would affect greatly on the grinding effect.

(1). Efficiency of cutting

It apply rough granular emery wheel for rough cutting, and could be more efficient in cutting as the surface of the emery wheel would be rougher by the trimmer passing through quickly.

(2). Finish grinding

When precious grinding, the fine granular is available as the trimmer pass through slowly.

(3). Deforming of the work piece

Whether work become deformed largely by grinding may be caused by great metal allowance of the cutting or the slowly movement of the worktable or the blunt wheel or scraps adhering on the wheel.

G. Examinations of the emery wheel

Be aware of obeying such regulations absolutely. The view of this point is to protect workers from dangers]

Examinations and installations of the emery wheel

The wheel should have had examinations before installing. In general, testing echoes of the wheel is appropriate. Use a spindle through the emery wheel as a bracket, then hit slightly with wooden hammer.

Even if cracks can't be perceived could discriminate by apparently different echoes.

A complete wheel would have an explicit echo, and the bad one absolutely not.

There are two pieces of paper on both sides of the emery wheel could be used as cushion between the wheel and the flange. Don't tear it off as installing, and then slide the wheel into the flange slightly by hand without exerting. The flange should clean clearly, especially of the positioning, fixing surfaces. As the wheel spin in the draining water for several days the paper cushion will spoil. Tighten the wheel at this time.

h. Trimming and usage of the trimmer

There is a trimmer adhering on the magnetic plate or a parallel trimming wheel on the worktable could be available as the wheel trimmer. The embedded diamond trimmer should make angle of 5 degree with the wheel, since the consumption part of the diamond could in line with the rotation way, and could keep the trimmer acute in trimming.

As rotation speed is changed finish would change also.

Whether the grinding depth is 0.2-0.3mm, rough trimming which could be gotten by rotating the manual wheel rapidly, passing the trimmer through quickly, and what could get the larger scraps. And if precious grinding is available for the same wheel, the wheel should re-trim, trim two to three times carefully and slowly, with each time trimming depth is 0.01mm.

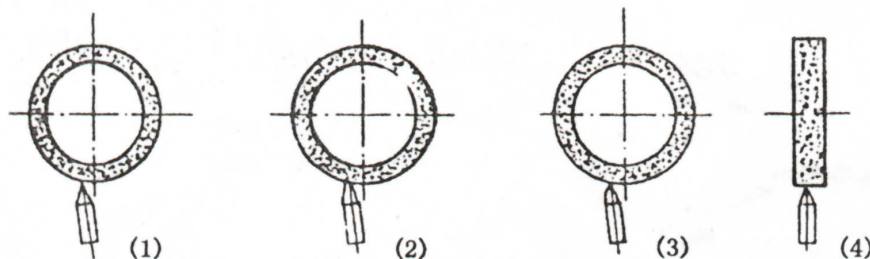
In general, as far as the service life for the wheel, light trimming is better for the hard one.

With trimming, the diamond should keep as cooler as possible. Cooling sharply is fairly dangerous yet and could cause diamond engender cracks as well as a slight hitting, since diamond is tough and hard.

Begin trimming with the central part. The consumption of the center is more than the sides.

Whether begin with one of two sides would stress inside what will cause the possibility of being split.

As far as hi-precision grinding, the trimmer adhering on the magnetic plate is better than the parallel trimming wheel mounting on the front seat of the spindle (because the trimmer adhering on the magnetic plate is more stable.)



- (1). New diamond trimmer make angle about 45 degree with the emery wheel.
- (2). The consumed diamond keep on using in acute with turning over.
- (3). The turned over diamond trimmer have the same action point with the emery wheel.
- (4). The circumstances of trimming begin with the central part.

## I. Store of the emery wheel

The emery wheel should be stored in the dry stand, and avoid vibration and hitting.

The principle of storing of the emery wheel is standing in upright of the thick one, placing in horizon of the thin one or the edged one.

Don't stain the wheel with grease or oil. The stained wheel would not only slip for no contacted surface but also shorten the life service.

J. Outlines of selecting the emery wheel

The code name of the emery wheel as WBA46ZRI as example:

WB: Categories of the grinding material

46: Grade of fineness

ZRI: Grade of binding

A: Binding compound

(a). Categories of the emery wheel:

GZ or GB: ideal for harder material that is steel, alloy steel etc. after heat treatment.

TF or GW: is available for harder alloy steel, especially for high-speed steel.

TH or TL: is available for cast iron and nonmetal and nonferrous metal.

DL: ideal for super-hardness material that is calcium wolfram.

(b). Grade of granular

Rough: 10,12,14,16,20,24

Intermediate: 30,36,46,54,60

Fine: 70,80,90,100,120,150,180

Grade of fineness	Rough	Fine
Grinding terms		
Grinding scales:	Much	Little
Degree of out-finish	Rough	Fine
Hardness of part:	Soft	Tough
Contacted area	Wide	Narrow
Diameter of the wheel	Large	Small

(c). Degree of bonding: Indicate strengths of the grits binding.

Soft: CR, R1, R2,

Intermediate: ZR1, ZR2, Z1, Z2.

Hard: ZY1, ZY2, ZY3, Y1, Y2, CY.

Degree of bonding	Soft	Hard
Grinding terms		
Work's hardness	Soft	Hard
Contacted area	Wide	Small
Table speed	Slow	Rapid
Rotating speed of the wheel	Rapid	Slow

(d). Binding compound

A: Porcelain binder

X: Robber binder

S: Resin binder

k. Lists of selecting emery wheel

Material of work		Diameter of emery wheel	
		Less than 205mm	205-355mm
Steel	HRC20	GZ46ZY1 GB46ZY1	GZ46ZY1 GB46ZY1
	HRC25	GB46ZR1	GB46ZR1
Alloy steel	HRC55	GZ46ZR1 GB46ZR1	GZ46ZR1 GB46ZR1
	HRC55	GZ46R2 GB46R2	GZ46ZR1 GB46ZR1
Tool steel	HRC60	GZ46ZR1 GB46ZR1	GZ46R2 GB46R2
	HRC60	GZ46R2 GB46R2	GZ46R2 GB46R2
Stainless steel		GZ46R2 GB46R2	GZ46R2 GB46R2
Cast iron		TH46ZR1	TH46ZR2
Brass		TL30ZR1	TL30ZR2
Alloy aluminum		TL30ZR1	TL30ZR2
Tungsten carbide		DL60R2	DL60R2
Glass		TL60ZR1	TL60ZR1
Marble		TL36ZR2 DL36ZR2	TL36ZR2 DL36ZR2

l. Lists of grinding terms for emery wheel

(1). Wheel feed downwards

Work	Feed downwards and upwards			Feedforwards and downwards
	Cast iron, mild steel, harden steel	Stainless steel	Tool steel	
Precious cutting	0.0002-0.0004 0.005-0.01mm		0.002-0.0006 0.005-0.015mm	Less than 1/4t thickness of the wheel thick
Rough cutting	0.0006-0.0012 0.015-0.03mm	0.0008-0.0012 0.02mm	0.0008-0.0012 0.02-0.03mm	Less than 1/2 thickness of the wheel thick

Influences of feeding scales

Feed down and upwards	Large	Small
	Grinding appearance	
Grinding resistances	Much	Little
Heat	Much	Little
Roughness	<u>Rough</u>	<u>Fine</u>
Consumption of emery wheel	Much	Little

(2). Forwards and backwards feed

Feeding scale	Large	Small
Grinding resistances	Much	Little
Heating	Much	Little
Roughness	Rough	Fine
Consumption of emery wheel	Much	Little

(3). Feed rightwards and leftwards

Moving speed of the worktable	Rapid	Slow
Grinding resistances	Much	Little
Heat	Much	Little
Roughness	Rough	Fine
Consumption of emery wheel	Much	Little

Moving speed of the table

Material	Mild steel	Harden steel	Tool steel	Cast steel
Speed: M/min	6-15	20-25	6-25	16-20

(4). Linear velocity of the emery wheel appropriate for 1200M/min-1800M/min

Grinding circumstances	Linear velocity of the emery wheel	
	Rapid	Slow
Grinding resistances	Little	Much
Heating	Much	Little
Roughness	Fine	Rough
Consumption of the wheel	Little	Much
Security	Bad	Good

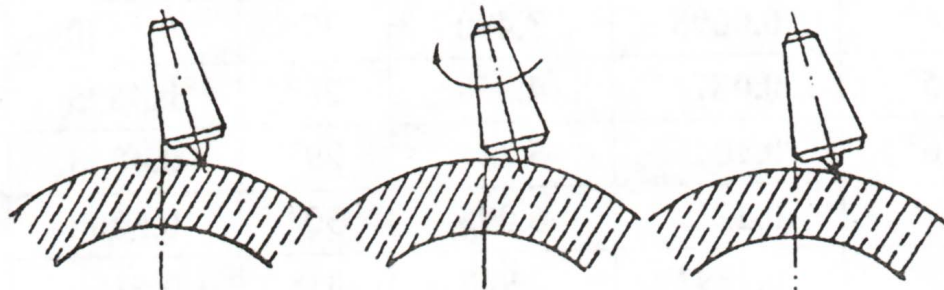
Material of work	Linear velocity
Steel	20-30M/Min
Cast iron	18-20M/MIN
Tungsten carbide	8-18M/Min
Zinc alloy light metal	15-30M/Min

m. Usage of the special accessories

(a). Parallel trimmer

The trimmer could be the trimmer adhering on the magnetic plate or the parallel trimmer on the front seat. The diamond trimmer should make angle five degree with the wheel because another side could keep acute and keep on using as turning over a certain angle when the trimmer have been grinded, and such way could keep the sharp edge of the diamond. The trimming methods and action points are same as trimming of the emery wheel.

The experiences show that the trimmer adhering on the electronic clipping plate is better for the parallel trimmer on front seat of the spindle, because the former is more stable the latter may generate slight vibrations of the emery wheel surface (for the slight vibrations coming from the spindle)



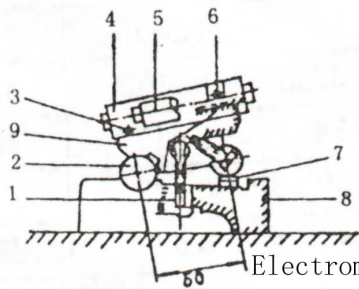
(b). Angle shaper

(1). The angle shaper adhering on the magnetic plate makes right angle with the emery wheel, and the magnetic plate should keep level.

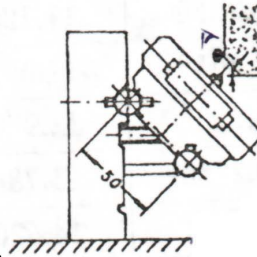
(2).  $B = \sin A * 50$  Determine the value of B by the sinus value of angle A-multiplying 50

(3). Make the thickness of the united lump gauge or a block equal up the value of B.

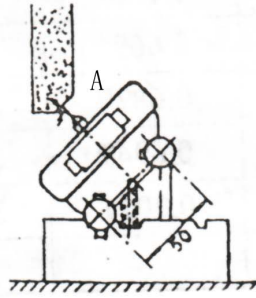
(4). Begin trimming until the slip gauge is fixed up by the bolt that place under the bar gauge.



Electromagnetic chuck



A more than 45 degrees



A less than 45 degrees

- (1). Set bolt
- (2). Datum line
- (3). Plus-minus screw of the bolt
- (4). Slipping platform
- (5). Knob
- (6). Fixing bore of the diamond trimmer
- (7). Slip gauge
- (8). Angle shaper seat
- (9). Bar gauge platform

(5). Reference list of angle and thickness of the slip gauges

Angle	Sinus (Sine)	Thickness of slip gauge	Angle	Sinus (Sine)	Thickness of slip gauge
1°	0.0175	0.875	24°	0.4067	20.335
2°	0.0349	1.745	25°	0.4226	21.130
3°	0.0523	2.615	26°	0.4384	21.920
4°	0.0698	3.490	27°	0.4540	22.700
5°	0.0872	4.360	28°	0.4695	23.475
6°	0.1045	5.225	29°	0.4848	24.240
7°	0.1219	6.095	30°	0.5000	25.000
8°	0.1392	6.960	31°	0.5150	25.750
9°	0.1564	7.820	32°	0.5299	26.495
10°	0.1736	8.680	33°	0.5446	27.230
11°	0.1908	9.540	34°	0.5592	27.960
12°	0.2079	10.395	35°	0.5736	28.680
13°	0.2250	11.250	36°	0.5878	29.390
14°	0.2419	12.095	37°	0.6018	30.090
15°	0.2588	12.940	38°	0.6157	30.875
16°	0.2756	13.780	39°	0.6293	31.465
17°	0.2924	14.620	40°	0.6428	32.140
18°	0.3090	15.450	41°	0.6561	32.805
19°	0.3256	16.280	42°	0.6691	33.455
20°	0.3420	17.100	43°	0.6820	34.100
21°	0.3584	17.920	44°	0.6947	34.735
22°	0.3746	18.730	45°	0.7071	35.355
23°	0.3907	19.535			

When using the bar gauge, the list could be adopted as far as thickness of the slip gauge multiplies two.

(c). Bar gauge

Bar gauge is adopted to correct the bevel angle of the electromagnetic chuck when the angle shaper processed area is larger.

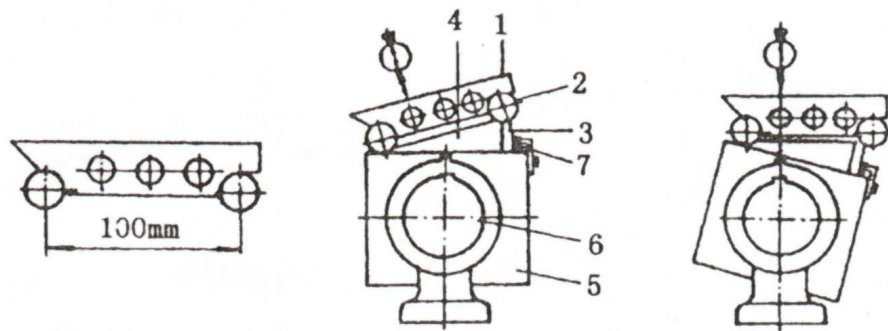
(1).  $B = \sin A * 100$  Determine the value of B by the sinus value of angle A multiplying 100.

(2). Take slip gauges whose thickness equal up the the value of B.

(3). Place such slip gauge adhering under the inclinable electronic chuck under one end of bar gauge that should be parallel with forwards and backwards moving direction of machinery.

(4). Move the table by rotating frond ward and backward knob wheel to correct the angle of the electromagnetic chuck with the dial gauge indicating.

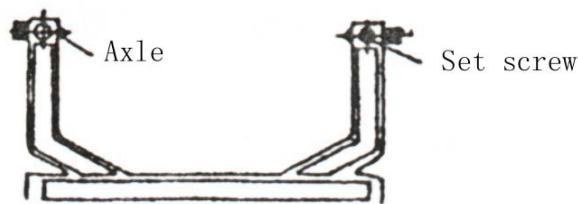
1. Bar gauge
2. Datum line
3. Slip gauge
4. Usage of trigonometry
5. Inclinable electromagnetic chuck.
6. Datum line of the inclinable electromagnetic chuck
7. Stopper



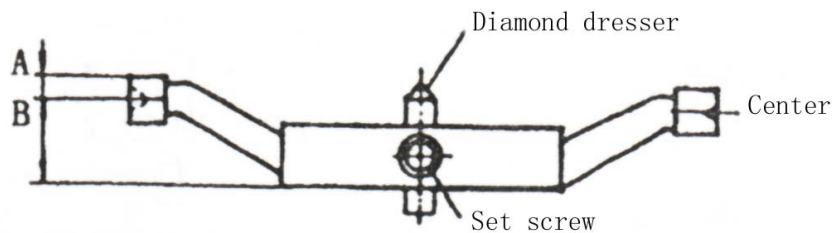
(D). "R" shaper

The "R" shaper consists of a seat, several rocking bars and a diamond trimmer

(1) Setting



(2). The dimensions of A. B mark on the plaque of the rocking bars and the diamond trimmer.



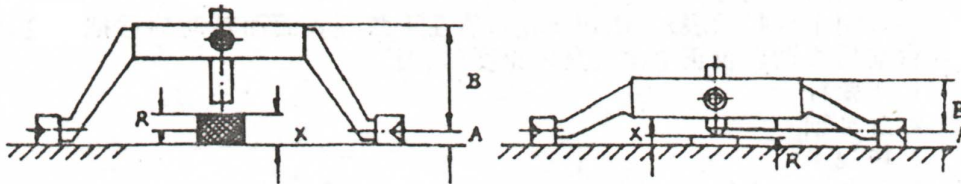
A, The distances between the center and the upside of the gauge

B. The distances between the center and the downside of the gauge

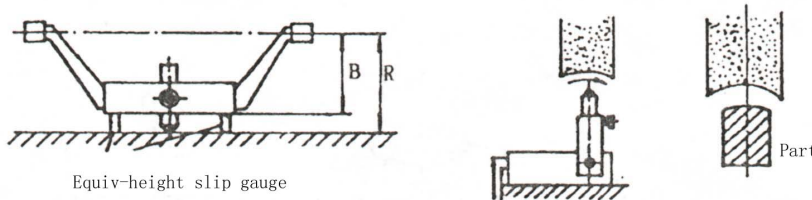
“R” shaper is obtained by adjusting the distance between the diamond trimmer and the center of the rocking bars.

(3). How to determine the convex and concave curvature (R)

- a. If the edge of the head of the diamond trimming blade coincide of the central line of the rocking bars, R equal O. ( $R=0$ )
- b. The evaluation of the convex curvature (R)  
Place the rocking bars on the plate, and place the slip gauge with the certain thickness under the trimmer, ( $R=X-A$ ) X minus A is R.
- c. The evaluation of the small scale concave curvature (R) A minus X is R (see the right lower figure)



- d. The evaluation of the large scale concave curvature (R).  
B adds X is R ( $R=B+X$ )

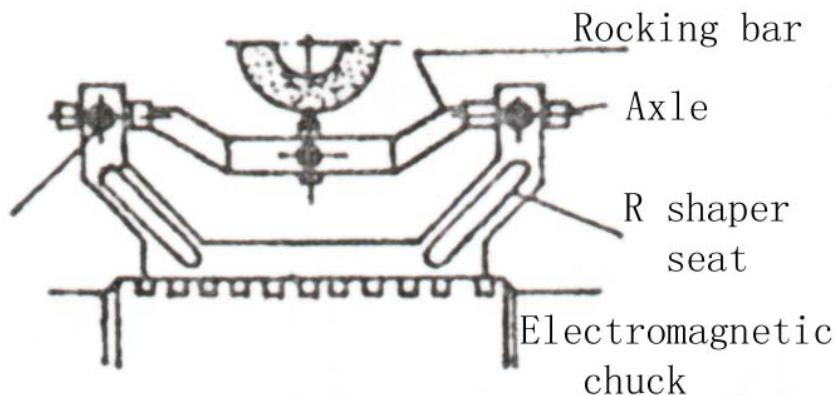


The same thickness slip gauge (X) work.

- e. Cautions
  1. The bottom and the side of the grinding wheel should keep integral.
  2. “R” Shaper is in parallel direction with the emery wheel
  3. The diamond trimmer is in parallel direction with the “R” shaper

(4). The directions of “R” shaper operation

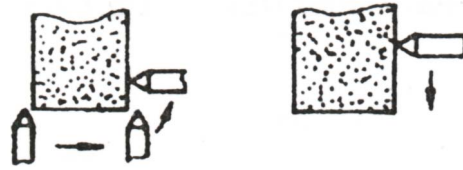
- (a). Find out the central point of the emery wheel, and fix the worktable then.



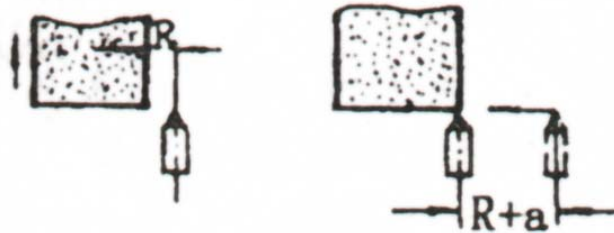
- (b). Feed the diamond trimmer into the emery wheel about 0.0002mm at the point of 1/3 thickness of the emery wheel thick by rotating upward and downward knob wheel. And turn graduation disc of the upward and downward knob wheel to zero.



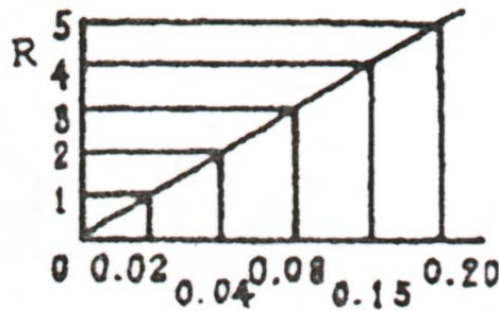
(c). Turn around the diamond trimmer angle 90 degrees and raise it to a certain height. (More than the size of evaluation R)



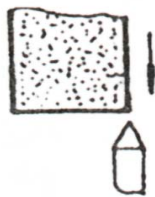
(d). Raise the emery wheel to depart the diamond trimmer, make the distances between the side of the emery wheel and the diamond trimmer is exactly the evaluation of R



(e). Move the diamond trimmer leftwards of the value R+A. This is evaluated by the following list.



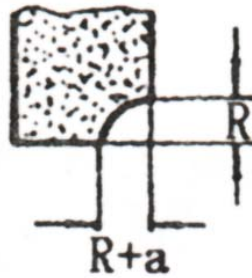
(f). Move the emery wheel close to the diamond trimmer .by rotating the upward and downward knob wheel.



(g). Rotate the rocking bars and make angle of 90 degrees every time, and the feeding scale is 0.05mm by each, until the ideal is obtained.



(h). The shaped emery wheel is shown in the lower.



E. The draining system

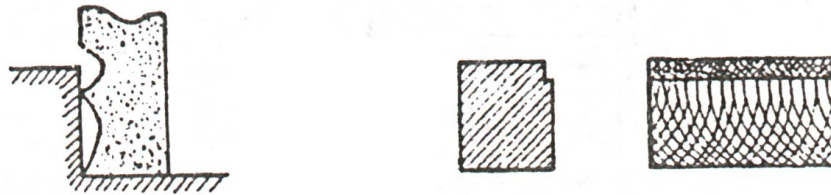
Put the power plug into the draining motor outlet.

The pump will rotate in clockwise when the pump button is pressed, if not, change any two cables of the three. And then rotate the ball valve to an appropriate volume.

F. General terms of lateral grinding



(1). The effect and accuracy is the best when the lateral grinding mentioned above has the smallest contacting areas with parts.



(2). The effect and accuracy is better when the lateral grinding mentioned above has the smaller contacted areas with parts.



(3). The emery wheel mentioned above has no escaping angle and contacts fully with the whole surface of the part that could make the processed surface rough and uneven, even leaving scorch and cracks.



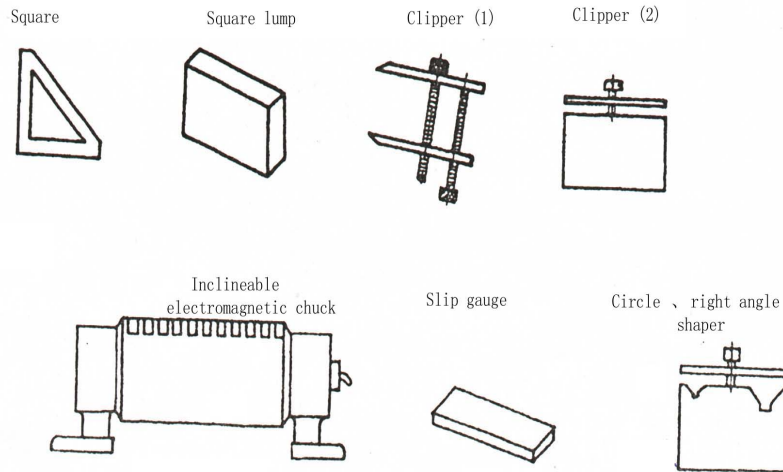
(4). Escaping angle of the emery wheel mentioned above is lower than the work surface with which the processed surface contacted in dual sections, the upper of which is similar with (3) the down side of which is similar with (1), Escaping angle of the wheel should expand to be higher

than the work surface. If the spindle isn't vertical with the worktable surfaces the lateral grinding is shown as follows.



### G. Vertical grinding

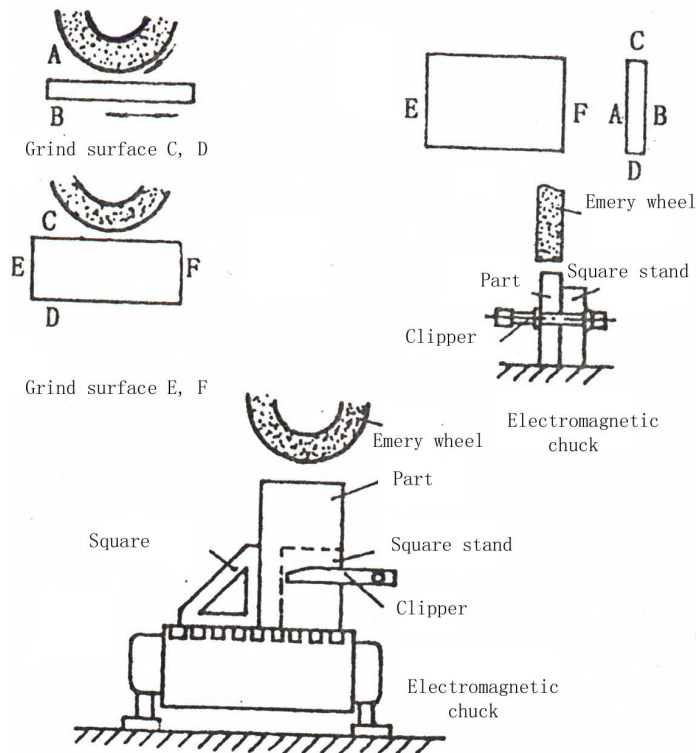
#### (1) Usage of tools



(2). Usage of the tools: For example grinding A, B, C, D, E, F, six surfaces.

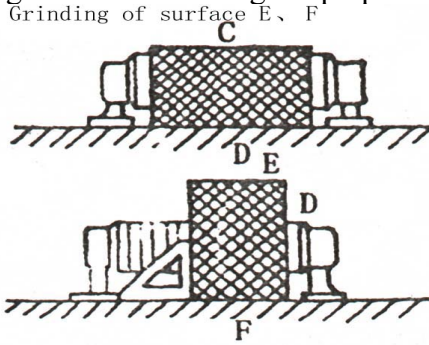
a. More than 200mm

Grind datum surface firstly, such as grinding A, B surfaces.



b. Less than 200mm

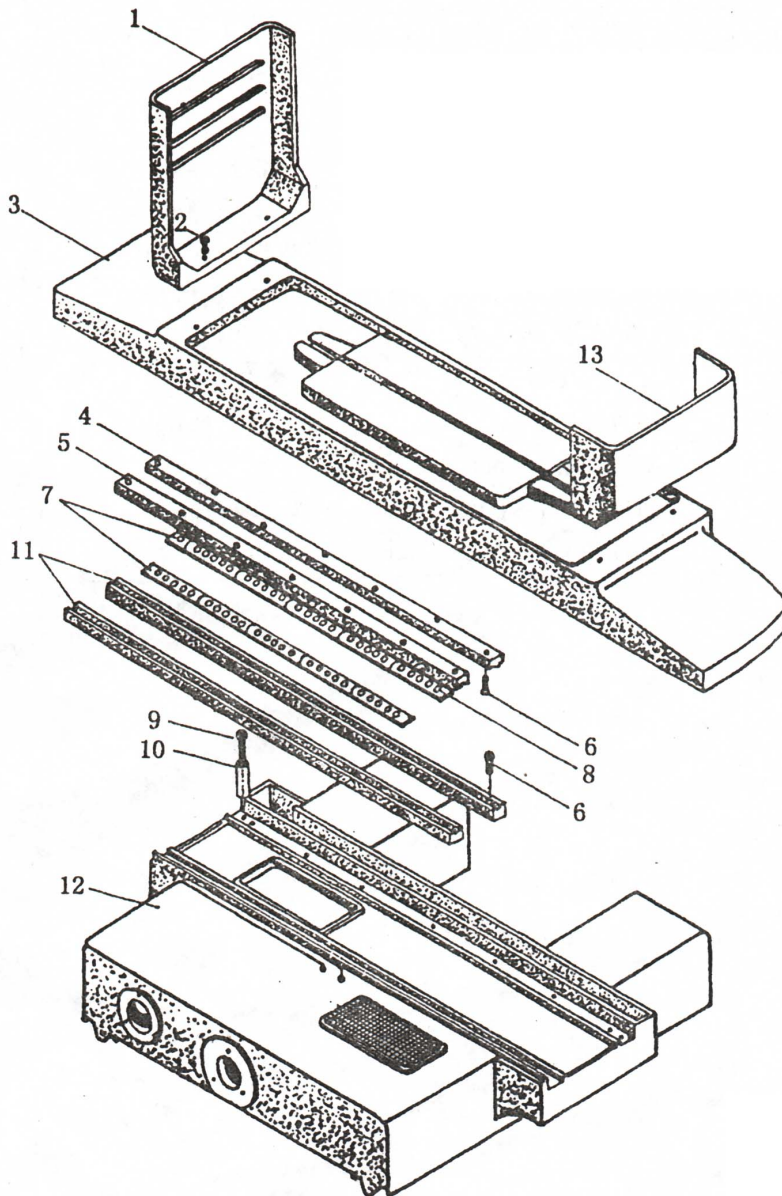
Grind the datum surface such as A, B surface. Grind C, D surface as turning the inclinable electromagnetic chuck 90 degrees and correcting the perpendicularity with the dial gauge.



(3). Caution: The precision of vertical grinding depends on patience and carefulness of workers such as removing of burrs, cleaning of the worktable, precision of the square.

N. Assembly drawings and lists

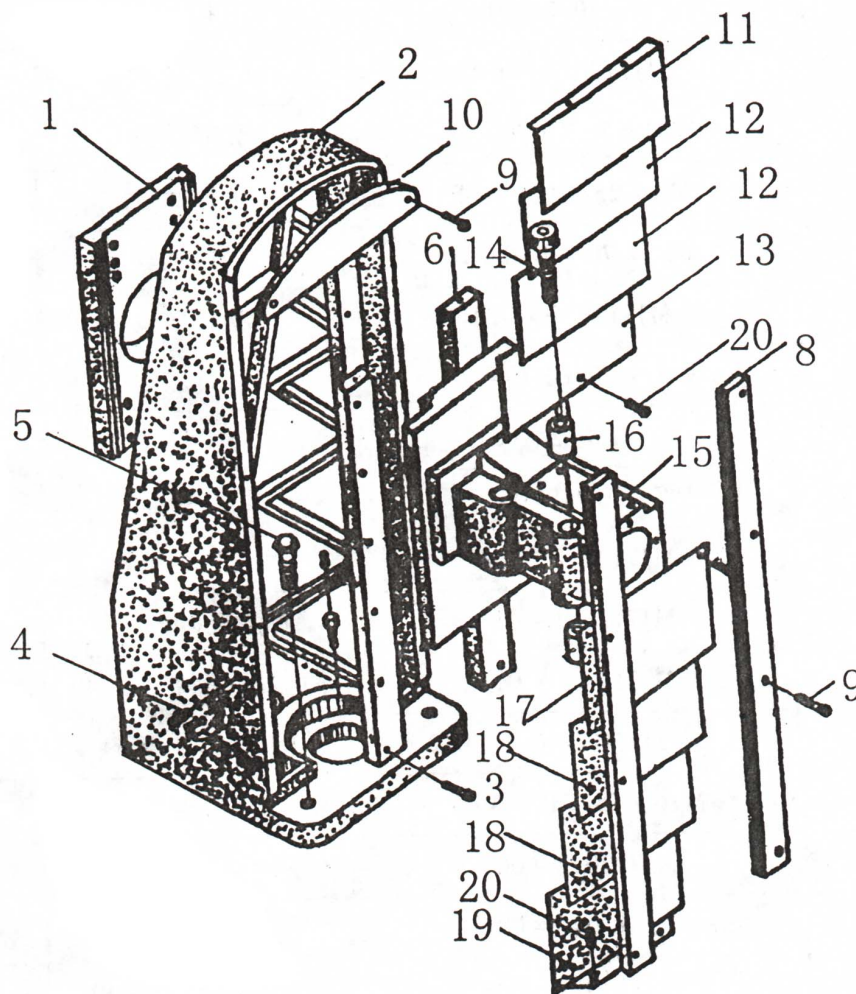
i. Model TH-MJ1640 upside and middle table assembly drawing



Model TH-MJ1640 up and middle table assembly list

No.	Item	Name	Number
1	TH-MJ1640.3-006	Dustproof (left)	1
2	M8×18/GB70-85	Dustproof screw	2
3	TH-MJ1640.1-003	Table	1
4	TH-MJ1640.1-040	Steel ball guider	1
5	TH-MJ1640.1-061	Steel ball guider	1
6	M6×20/GB70-76	Steel ball guider screw	28
7	TH-MJ1640.1-041	Steel ball holder	8
8	5/8"/GB308-77	Steel ball	39
9	M6×22/GB70-85	Fix screw	4
10	TH-MJ1640.1-063	Steel ball blocker	4
11	TH-MJ1640.1-060	Steel ball guider	4
12	TH-MJ1640.1-002	Middle table	1
13	TH-MJ1640.1-064	Dust proof (right)	1

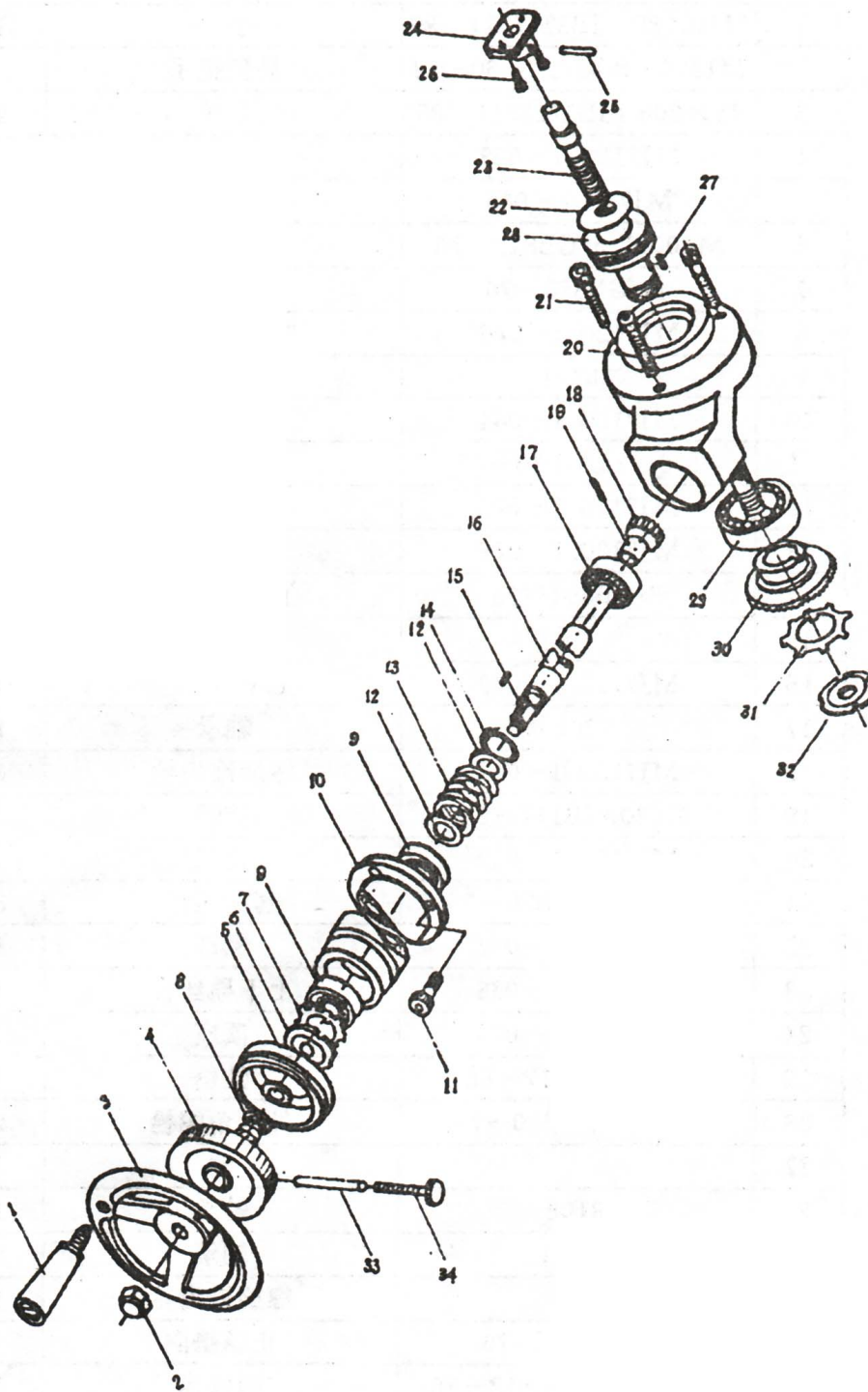
ii. TH-MJ1640 column assembly drawing



TH-MJ1640 column assembly list

NO.	Code	Name	Number
1	TH-MJ1640.1-018	Saddle	1
2	TH-MJ1640.1-004	Column	1
3	M12×50/GB70-76	Socket bolt	3
4	M8×25/GB77-85	Check screw	14
5	M20×70/GB30-76	Hexagon screw bolt	4
6	TH-MJ1640.2-020	Left and right guiders	2
7	M10×30/GB70-76	Socket screw	14
8	TH-MJ1640.2-021	Dustproof guider	2
9	M6×20/GB70-76	Socket screw	10
10	TH-MJ1640.2-024	Upside frame cover	1
11	TH-MJ1640.1-014	Dustproof (upside #1)	1
12	TH-MJ1640.1-013	Dustproof (upside #2.3.4)	2
13	15-311 TH-MJ1640.1-012	Dustproof (Upside #5)	1
14	M15×75/GB70-76	Socket screw	22
15	TH-MJ1640.2-001	Grinding tools seat	1
16	TH-MJ1640.2-002	Spindle sleeves	2
17	TH-MJ1640.2-009	Dustproof (downside #1)	1
18	TH-MJ1640.1-010	Dustproof (downside #2.3.)	2
19	TH-MJ1640.1-011	Dustproof (downside #5)	1
20	M5×10/GB68-85	Minus sunk screw	4

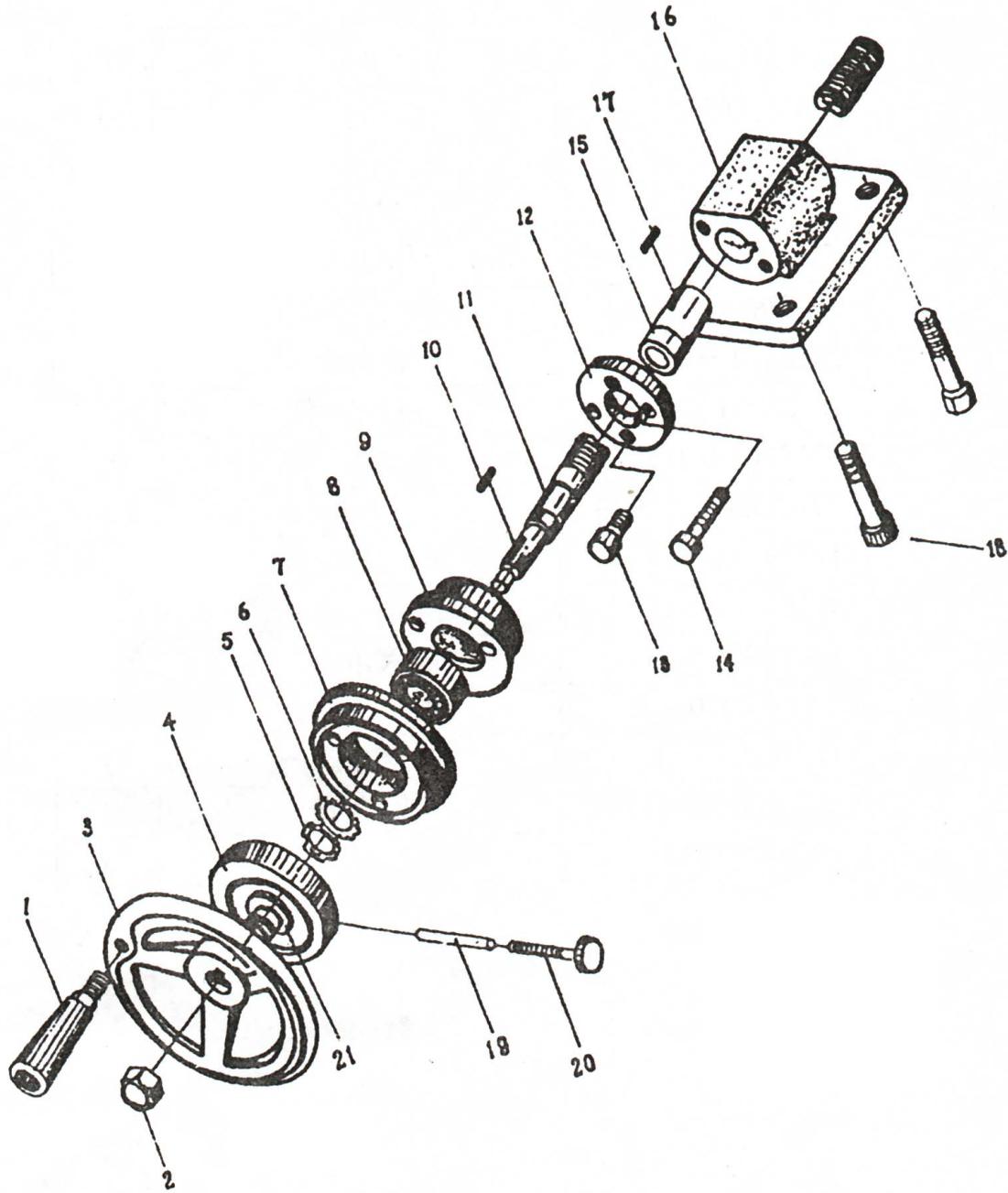
iii. TH-MJ1640 upward and downward mechanism assembly drawing



TH-MJ1640 upward and downward mechanism assembly

Part No.		Upward and downward mechanism assembled	
No.	Item	Name	Number
1	M10×80JB2717.11-85	Knob wheel	1
2	M1250B/JB1360-73	Radial knob	1
3	18×200JB3717.11-85	Knob wheel	1
4	TH-MJ1640.1-023	Graduation disc	1
5	TH-MJ1640.1-045	Slider disc	1
6	M40×1.5/GB812-76	Round nut	1
7	40/GB858-76	Check washer	1
8	TH-MJ1640.1-046	Graduation disc socket	1
9	36204	Bearing	1
10	TH-MJ1640.1-044	Driving shaft seat	1
11	M8×25/GB70-85	Socket screw	3
12	TH-MJ1640.1-077	Washer	2
13	TH-MJ1640.1-078	Spring	1
14	8/GB894-76	Male clip ring	1
15		Key	1
16	TH-MJ1640.1-043	Driven shaft	1
17	204	Bearing	1
18	TH-MJ1640.1-042	Spiral bevel gear	1
19	6×30/GB117-86	Bevel gear	1
20	GB7120.1-039	Bracket	1
21	M12×50/GB70-85	Socket screw	3
22	TH-MJ1640.1-037	Nut	1
23	TH-MJ1640.1-036	Up and down leading screw	1
24	TH-MJ1640.1-035	Top seat	1
25	6×30/GB117-86	Taper pin	1
26	M8×25/GB30-76	Hexagon screw bolt	2
27		Key	1
28	8108	Bearing	1
29	46111	Bearing	1
30		Spiral bevel gear	1
31	40/GB812-76	Check washer	1
32	M40×105/GB812-76	Round nut	1
33	TH-MJ1640.1-020	Set bolt	1
34	TH-MJ1640.1-021	Plus-minus screw	1

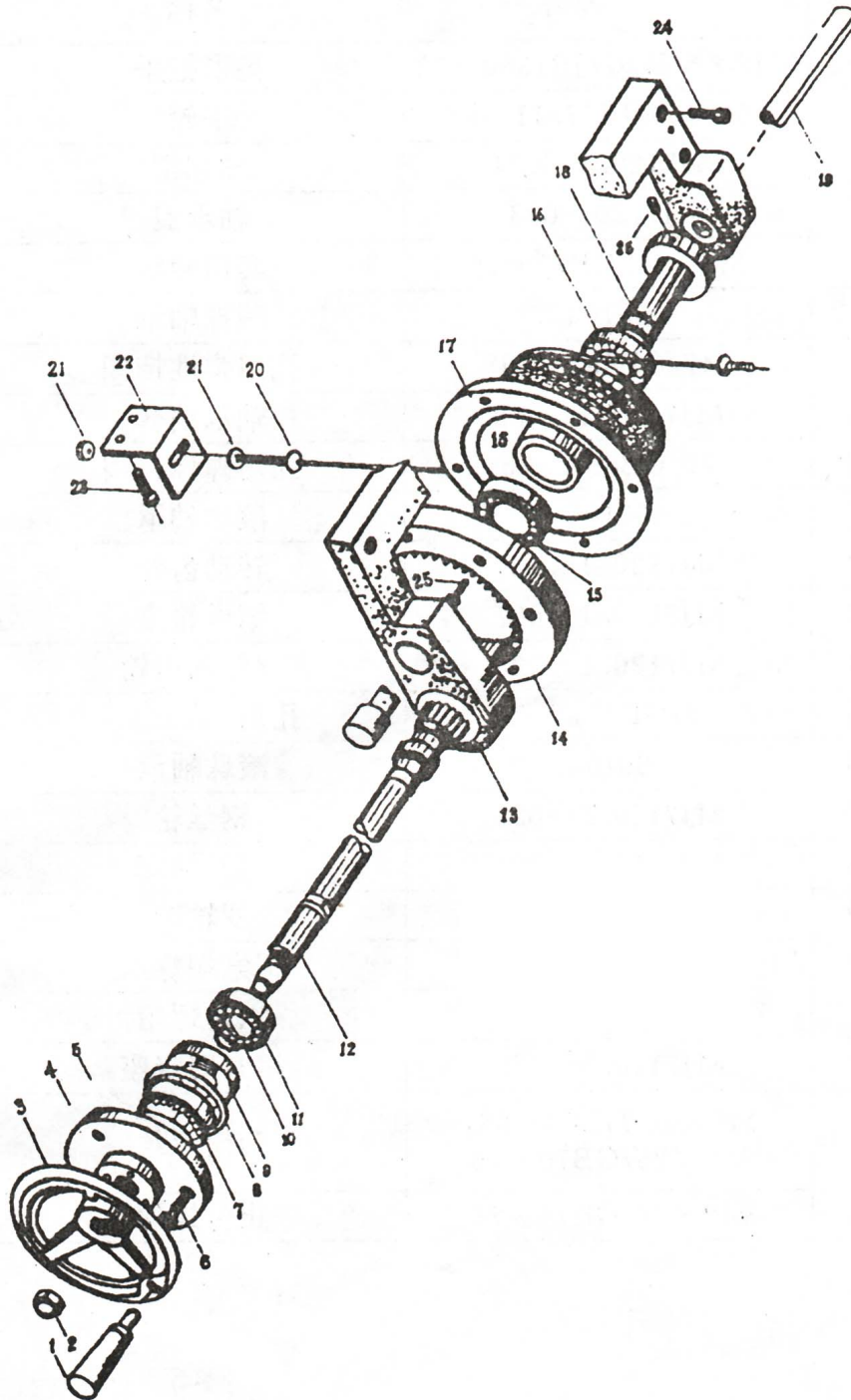
iii. Model TH-MJ1640 forward and backward manual mechanism assembly drawing



Model TH-MJ1640 Forward and backward manual mechanism assembly list

No.	Item	Name	Number
1-2	M12×50B/JB1360-73	Radial knob	1
3	16×160/JB3717.9-85	Knob wheel	1
4	TH-MJ1640.1-047	Graduation disc	1
5	M20×105/GB812-76	Round nut	1
6	20/GB858-76	Check washer	1
7	TH-MJ1640.1-019	Slider disc	1
8	36204	Roller bearing	1
9	TH-MJ1640.1-018	Bearing seat	1
10	5×5×36/GB1096-79	Flat key	1
11	TH-MJ1640.1-017	Forward and backward leading screw	1
12	TH-MJ1640.1-012	Screw sleeve cover	1
13	M8×18/GB70-85	Hollow-head set screw	2
14	M8×18/GB70-85	Hollow-head set screw	2
15	TH-MJ1640.1-016	Screw sleeve	1
16	TH-MJ1640.1-015	Screw sleeve seat	1
17	8×730/GB1096-79	Flat key	1

iv. Model TH-MJ1640 Right and left ward manual mechanism assembly drawing



Model TH-MJ1640 Rightward and leftward manual mechanism assembly list

No.	Item	Name	Number
1-2	M12×50B/JB1360-73	Radial knob	1
3	16×160/JB37.11-85	Knob wheel	1
4	TH-MJ1640.1-034	Nut	1
5	TH-MJ1640-033	Bearing cover	1
6	M6×14/GB70-76	Socket screw	3
7	60104	Roller bearing	1
8	47/GB893-76	Female clip ring	1
9	TH-MJ1640.1-032	Shaft sleeve	1
10	20/GB894-76	Female clip ring	2
11	60104	Roller bearing	1
12	TH-MJ1640.1-031	Rotation toothed bar	1
13	TH-MJ1640.1-027	Steel rope wheel seat	1
14	TH-MJ1640.1-026	Annular gear	1
15	25/GB894-76	Female clip ring	1
16	60104	Roller bearing	2
17	TH-MJ1640.1-025	Steel rope wheel	1
18	TH-MJ1640.1-024	Axle sleeve	1
19	TH-MJ1640.1-029	Axle spindle	1
20	TH-MJ1640.1-069	Steel rope holding screw	2
21	M8GB6172-86	Hexagon nut	4
22	TH-MJ1640.1-059		2
23-24	M6×16/GB70-85		4
	M8×25/GB70-76		4
25	M8×14/GB74-76		3

## O. Shortcomings of the grinding surface and amending measures

Shortcomings	Causes	Amending measures
Corrugations on part's	The worktable vibrate irregularly	Balance the emery wheel according to the general way
		Examine the pump and the pipes
		Examine the spindle coupling
		Examine bolt of the bed
Surface	Unstable	Trim tow sides of the emery wheel to a correct shape
		Balance the emery wheel again
		Examine the work table speed
		Decrease the downwards cutting allowance
	Emery wheel is too tough or stuffed by impurity	Decrease the forward cutting allowance
		Use the softer or the larger fineness emery wheel
		Decrease the downward cutting allowance (as grinding)
		Examine the consumption of the trimmer
		Trim the emery wheel into a larger granular
		Increase the times of trimming
Leave scorches on the part's surface	The emery wheel is too tough or the granular is too fine	Use softer and rougher emery wheel or decrease the linear velocity of emery wheel
	The emery is too blunt or being stuffed	Trim the emery wheel and use the rougher one
	The feed of cutting downwards is too large	Decrease the feed of cutting downward and forward
	The action of the draining water is not enough	Increase the volume of the draining water or fill the tank
		Filter the draining water
		Use mixed coolant for cooling