

SUPRA. 550 BENCH LATHE

# OPERATION MANUAL

MAX. SWING OVER BED  $\phi$  250mm

MAX. LENGTH OF WORKPIECE 550mm

## 1. Main Features & Application

This machine is designed to machine cast iron pieces, steel pieces, non-ferrous metal and non-metal pieces up to  $\phi 250\text{mm}$ . The size of the spindle bore allows bar stocks up to  $\phi 20\text{mm}$  to go through it. It can work out cylinder, cone, steps, end-surface, holes (drilling and boring), threads (Metric and Imperial), on parts of general purpose.

This machine features high accuracy, reliable quality and easy operation.

As no concrete foundation is necessary, the installation is as simple as fixing in on an iron or wood working table. Iron working table is available upon special order. The leadscrew is made of cold-reduced trapezoidal steel for higher surface hardness, wear resistance and durability. It is your ideal choice for shops, instrument factories, household maintenance, auto repair, light industry machinery factories for piece production or batch production. It is also ideal for school training.

## II. Main Specifications

Max. Swing over bed	250mm(10")
Max. Length of working piece	550mm(22") 720mm(25/32")
Spindle bore	M.T.3
Spindle speed(6 steps)	125-2000r.p.m.(50Hz) 160-2470r.p.m.(60Hz)
imperial feed	0.1-0.2mm/rev(0.0039-0.01")
Sectional area of cutter shank	14 × 14mm(9/16" × 16")
Metric thread	0.4-3mm
Number of pitch	12
Imperial thread	10-44/25.5mm
number of pitch	8
Sleeve taper of taistock	M.T.2
Power of Motor 50/60Hz	550w 110v/240v/400v
Overall dimensions(LXWXH)	1185/550 × 565mm (37" × 23" × 22")
Net Weight	110/242bs
Gross Weight	150/330bs

### III. Drive System

See Fig.1, Table 1, Component Drawing  
1500

The headstock spindle and the feed system are driven by Jz7134 motor installed at the rear of the bde. Parts like the driving protecting. and shaft are assembled on overplate 1505 attached to the headstock. The drive system can be exposed by opening the portecting cover of the motor. When the V-belt is hooked to the spindle will run at high speed, ie, 620, 1000 or 2000 rpm; when the V-belt is hooked to the synchronized counter pulley 1502 which is driven by the motor through a tooth belt, the spindle will run at low speed, ie, 125, 210 or 420 rpm, thus resulting in altogether six speeds of the spindle. The clockwise and counter-clockwise running of the machine is achieved through a switch in the control box.

The tension pulley of the driving belt is composed of two 21 singlerow anular bearing which is lubricated by a white grease for less power consumption. This pulley is assembled on the fan-support 1516 to be adjusted in two direction. If the belt gets loose, it can be tightened for proper operation through the tension pulley 1512 in the fan-support, tighten the V-belt to a proper extent and then retighten retighten the bolt.

#### Feed System

Different feeding speeds of the tool rest is obtained by engaging the gear on the rear of the spindle, to change gears of different teeth in the change gear box to turn the spindle, and then closing the clasp nut by means of lever 608 on the apron. Similarly, different cutting pitch can be reached.

When the headstock spindle runs in

its normal direction, Right threads are cut. If you need to cut left threads, just take the set of 4 teeth gear bolt component from the accessories and fix it under the spindle, engaging it to the original 40 teeth tear-bolt component, the lead screw 114 sill then run in the reverse direction to cut left threads.

### IV. Bed

See Fig.100

All the components of CJD are assembled on the bed, which is made of cast iron HT200 and inner-stress released through heat treatment to ensure no deformation will occur after long-term application, and the bed will have rigidity to sustain working load. Rhombus guides are fixed on the bed for linear movement of the carriage and the tailstock. The drive lead screw 114 is set on the bed. The lead screw is driven by the spindle gear and the change gear in the change gear box. The apron is driven by the lead screw. Before leaving factory, the moving accuracy of the scriw 114 and the rack 115 against the guides has been finely adjusted against the technical specifications, no adjustment is necessary by the user.

After long-usage, if excessive axial movement of the lead screw is found, following steps can be taken:

1. Open the protecting cover 104 on the left, to expose the left support of the lead screw 101.
2. Unfasten the screw 112, pull the taperpin 113 out, and take off the right support of the lead screw 111.
3. Unfasten the screw 116, take off the change gear and flat key on the left of the screw.

4. Close the clasp of the apron to engage the lead screw. Remove the left support to the right by turning handle, then take off the adjusting disc 117.

5. Machine the pressing surface of the adjusting disc based on the clearance to extend the axial supporting length and eliminate the clearance, then fix all the components back according to the dismounting order.

## V. Headstock

See component Drawing No.200 and 900

As the stepped pulley belt drive is adopted, the headstock is very simple. Mainly composed is very simple. Mainly composed of case, spindle, bearings, check ring, pulley, nut etc. The headstock is the key part of machine tools, and critical to the cutting accuracy and surface finish. Therefore, high precision is maintained during its manufacturing. The two supports of the spindle are of highly accurate 2007107D Single Row Taper Roller Bearing capable of sustaining radial and axial cutting load, thus ensuring light dynamic rigidity and turning accuracy of the spindle. The clearance of the spindle bearings has been well adjusted before leaving factory and customers don't have to readjust. When the machine has been used for long, its accuracy may reduce and there may be vibrations during cutting. The bearing can be adjusted in the following manner.

Loosen the outside Nut 209 and tighten the inside nut to limit the axial movement to 0-0.015mm, then tighten both nuts. If the two nuts are tightened too tight, the spindle may overheat at high speed, but as long as the temperature rise does not exceed 50, the spindle accuracy can be restored.

The chuck is fixed on the end of spindle with screws\*903.

## VI. Tailstock

See Fig.300

The tailstock is composed of the body, the tailstock leadscrew, the baseplate and others. It moves along the guides on the bed. To conduct drilling, tapping, reaming, turning and other operations, move the tailstock to an appropriate position, fix it with nut 304 and move the tailstock sleeve back and forth with Handle 320.

The manufacturing accuracy of the tailstock is maintained within allowable tolerance. "0" line is cut on both Bed 305 and baseplate 326 for alignment. If any deviation of the tailstock axial line is needed, the following steps should be taken:

1. Unfasten Nut 304, the tailstock is loosened from the bed;
2. Unfasten Screw 315 at end and screw 301;
3. Finely adjust 315 so as to move the tailstock to the required position;
4. Fasten screw 315, 301 and nut 304, it's ready for operation.

## VII. Rest & Saddle

See Component Drawing No.400, 500

The cutter rest and the saddle are connected, and composed mainly of the carriage, screw, apron, square rest, indexed base. Its longitudinal and transverse movement is possible both mechanically and manually. The rest can revolve 60° to left or right. There is an index ring on the hand lever, which can be used to cut cylinder, cone, flat surfaces of relatively higher accuracy. However, after much

usage, the dove-tail guide of the saddle, the carriage of the rest and the clamp plate of the saddle may cause excessive wear of the bed guides, so many the saddle leadscrew to the nut, thus lowering the cutting accuracy. TO eliminate the excessive clearance, adjust as follows;

- 1.adjustment of clearances of saddle carriage dove-tails and clamp plate to the bed guides; Unfasten nut 513, adjust screw 514 until clearance is eliminated. refasten nut 513. Adjust clearances of the rest carriage and saddle clamp plate 521 in a similar manner.

2. Adjustment of clearance of saddle leadscrew to nut.

Unfasten the two screws 535 and 517, take off the whole set of the leadscrew, fasten the two screw 510 to an appropriate extent, the clearance will be considerable reduced. Reinstall the leadscrew set and turn handwheel 501 back and forth. You may find the blank travel is substantially reduced, which means the working accuracy is enhanced.

revolving of the slotted disc, the cutter rest is moved forward. The moving speed of the cutter rest is preselected in accordance with the gear-change table. When cutting ends, pull back the clasp-nut lever and push is handwheel 619, and return the rest to the original position manually. For the sake of safety, pull out this handwheel then feeding is done mechanically.

The precision of the threads cut and the amount of feed are guaranteed by the clasp-nut 630 and the proper tolerance of the dovetail guides.

After long usage, the guides will unavoidably get down. so it is necessary to adjust the clearance between the clasp-nut can and the dove-tail guides.

Do it in the following way:

Unfasten nut 606, tighten screw 605 to such a degree that the clasp-nut can still glide on the guide without any jamming, fasten the nut.

## VIII. Apron

See component Drawing No.600

The Apron is the longitudinal drive component of the cutter rest, operable both mechanically or manual. It is composed of the case, the gears, shafts, the clasp-nut, and the operating lever.

To start cutting, press hand lever 608 down about 45°, the clasp-nut will engage the long leadscrew as result of the revolving of the slotted behind lever 608 down about 45°, the clasp-nut will engage the long leadscrew as result of the revolving of the slotted behind lever 608 down about 45°; the clasp-nut will engage the long leadscrew as a result of the

## Ix. Change Gear Box

See Component Drawing No.800

The change gear box is composed of the change gears, the shaft bolt, fixing shaft

Bolt and square nut etc. The change gear box is fixed of the left support of the leadscrew 101; To cut threads, select the proper change gears according to change gear engage with only about 0.1 mm tolerance in between, then fix screw 835.

The fixed shaft bolt 825 under the spindle is used for right hand cutting and threading. The set of fixed shaft bolt in the accessory kit is provided to work in combination with the original set of shaft bolt to reverse the rotation of the long leadscrew or left-hand threading and cutting.

The change gear for metric or inch threading is selected according to change gear table. The feed amount depends on the material to be cut, the surface roughness and finish requirement. If the two setting, 0.1 0.2, of the change gear table do not meet the requirement, the operator can add change gears. If the No. of teeth of our supplied change gear table do not meet the requirement, the operator can add change gears. If the No. Of teeth of our supplied change gears do not coincide with the calculated teeth numbers, just use gears with similar Numbers of teeth. However, in doing so, the following relationship of the driving shafts must be met:  $Z_3 + Z_4 > Z_2 + Z_5$ , (Fig a)

Otherwise the addendum of circles of  $Z_2$  and  $Z_5$  will hit each other.

eg: request feed distance 0.3/spindle round

Given: spindle gear  $Z=40$

$$\text{Feed Distance} = \frac{Z_1}{Z_2} \times \frac{Z_3}{Z_4} \times \frac{Z_5}{Z_6} \times t$$

$$\text{Screw Distance} = 2$$

$$\text{Solution: } \frac{0.3}{2} = \frac{10 \times 1.5 \times 2}{20 \times 2 \times 5} \times \frac{40}{80} \times \frac{60}{80} \times \frac{30}{75}$$

$$\text{Feed Distance } \frac{40}{80} \times \frac{60}{80} \times \frac{30}{75} \times 2 = 0.3 \text{ mm}$$

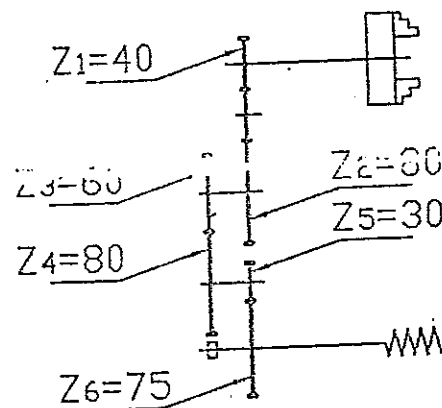


Fig a

eg: request feed distance 8TPI

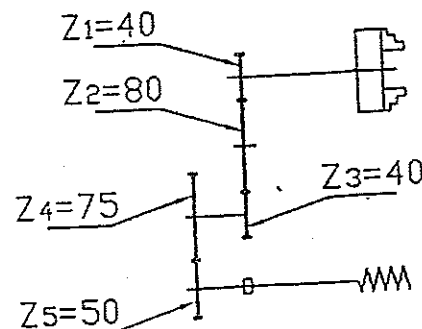
Given: spindle gear  $Z=40$

$$\text{Feed Distance} = \frac{Z_1}{Z_2} \times \frac{Z_3}{Z_4} \times \frac{Z_5}{Z_6} \times t$$

$$\text{Screw Distance} = 12 \text{ TPI}$$

$$\text{Solution: } \frac{12}{8} = \frac{40}{80} \times \frac{80}{40} \times \frac{75}{50}$$

$$\text{Feed Distance } 12 \div \left( \frac{40 \times 80 \times 75}{80 \times 40 \times 50} \right) = 8 (\text{TPI})$$



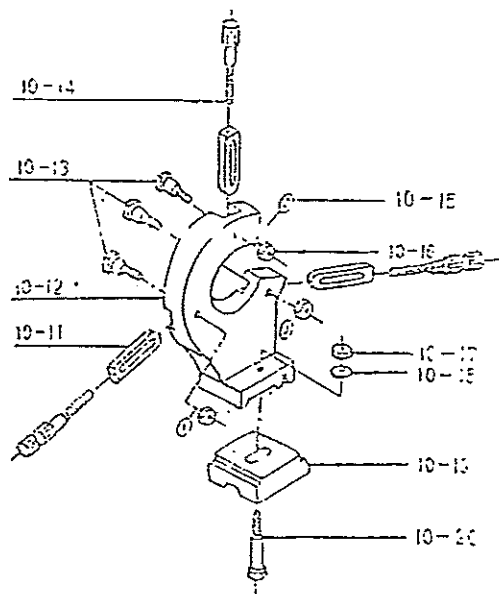
## X. Follow Rest & Steady Rest

See Component Drawing No.10-00, 10-10

The follow rest mainly used for cutting long and thin shaft pieces. To use it, fix it with screw 10-07 on to the saddle; turn adjusting bolt 10-02 to such a degree that two supporting feet of 10-03 touch the workpiece, and will follow the movement of cutting tool, thus ensuring no bending deformation will take place during cutting and better surface finish as a result of less vibration.

The application and principle of the steady rest are similar to those of the follow rest. The difference lies in that it is fixed on bed guides tools. As it has three supporting feet which means an additional supporting point, the workpiece will turn more steadily when used, so it is more frequently applied than the follow rest.

One example of its application is center positioning support for medium length shaft cutting to guarantee coaxality or the outer circle and the inner hole.



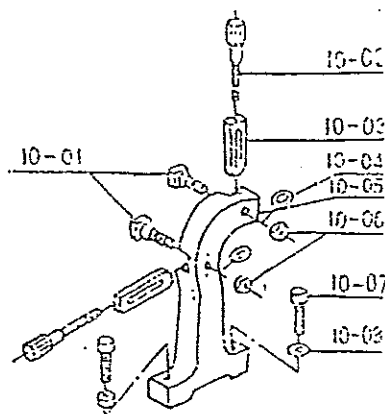
### Steady Rest

Item No.	Drawing No.	Name	Qty	Remarks
10-11	11013	Supporting Feet	3	
10-12	11011	Steady Rest Body	1	
10-13	11014	Clamp Screw	3	
10-14	11012	Adjusting Bolt	3	
10-15	GB97-86	Washer	3	10
10-16	GB6170-86	Nut	3	M10
10-17	GB41-86	Nut	1	M12
10-18	GB97-876	Washer	1	12
10-19	03014	Tailstock Champ Pancel	1	
10-20	GB8-76	Square Head Bolt	1	M12×70

Steady Rest

### Follow Rest

Item No.	Drawing No.	Name	Qty	Remarks
10-01	11014	Clamp Screw	2	Shared piece
10-02	11012	Adjusting Bolt	2	Shared piece
10-03	12012	Supporting Feet	2	
10-04	GB97-76	Washer	2	10
10-05	12011	Follow Rest Body	1	
10-06	GB52-76	Hexagonal Nut	2	M10
10-07	GB30-76	Hexagonal Bolt	2	M8×30
10-08	GB97-76	Washeer	2	8



Follow Rest

## XL Start-up, Operation & Maintenance

See Fig. II (Table 2)

1. Rest this Manual carefully before operation and get familiar with the functions of each operating control before start up your machine first time.

2. Clean and lubricate the machine according to the lubrication table each time before you start your machine.

3. Check on the drive belt, the amount of feeding and change gear system to ensure their appropriateness.

4. When the machine is in operation, all the protecting cover must be closed. It is absolutely not allowed to open the covers to

change belt speed or switch change gears.

5. Make sure all the above precautions have observed before starting the motor. In addition, if reversion of the motor rotation is necessary, make sure to give at least 3 seconds interval in between, so as to avoid any damage to the electric components.

6. Stop the machine for trouble-shooting at once when ever any malfunction is found.

7. Always keep the machine clean. Remove all chips, clean the guides and all sliding surfaces. Apply some anti-rust grease after each days operation.

List of Operating Pieces (Table 2)

Item No. If Fig. II	Name	Usage	Component No.
1	Reversing Switch	Change the Rotation Direction of the Spindle	200
2	Master Switch	To Turn on and off the Machine	200
3	Turn Lever	To Move the Saddle Transversely	500
4	Turn Lever	To Move the Saddle Transversely	600
5	Straight Lever	To Clamp the square Tool Rest	400
6	Straight Lever	To Move the Square Tool Rest Camiage Longitudinally	400
7	Straight Lever	To Control the Apron Clasp-nut	600
8	Straight Lever	To control the Tailstock Sleeve	300
9	Turn Lever	To Move Tailstock Sleeve Longitudinally	300

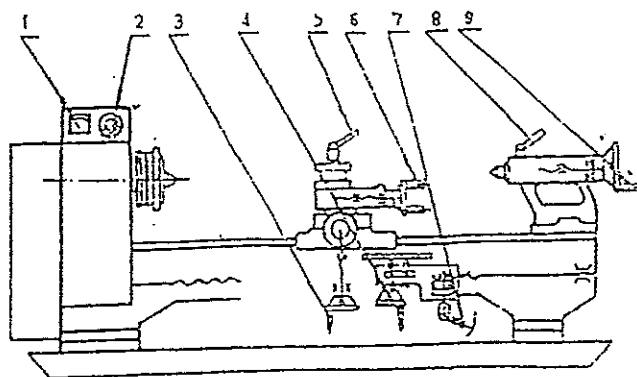


Fig. II Arrangement



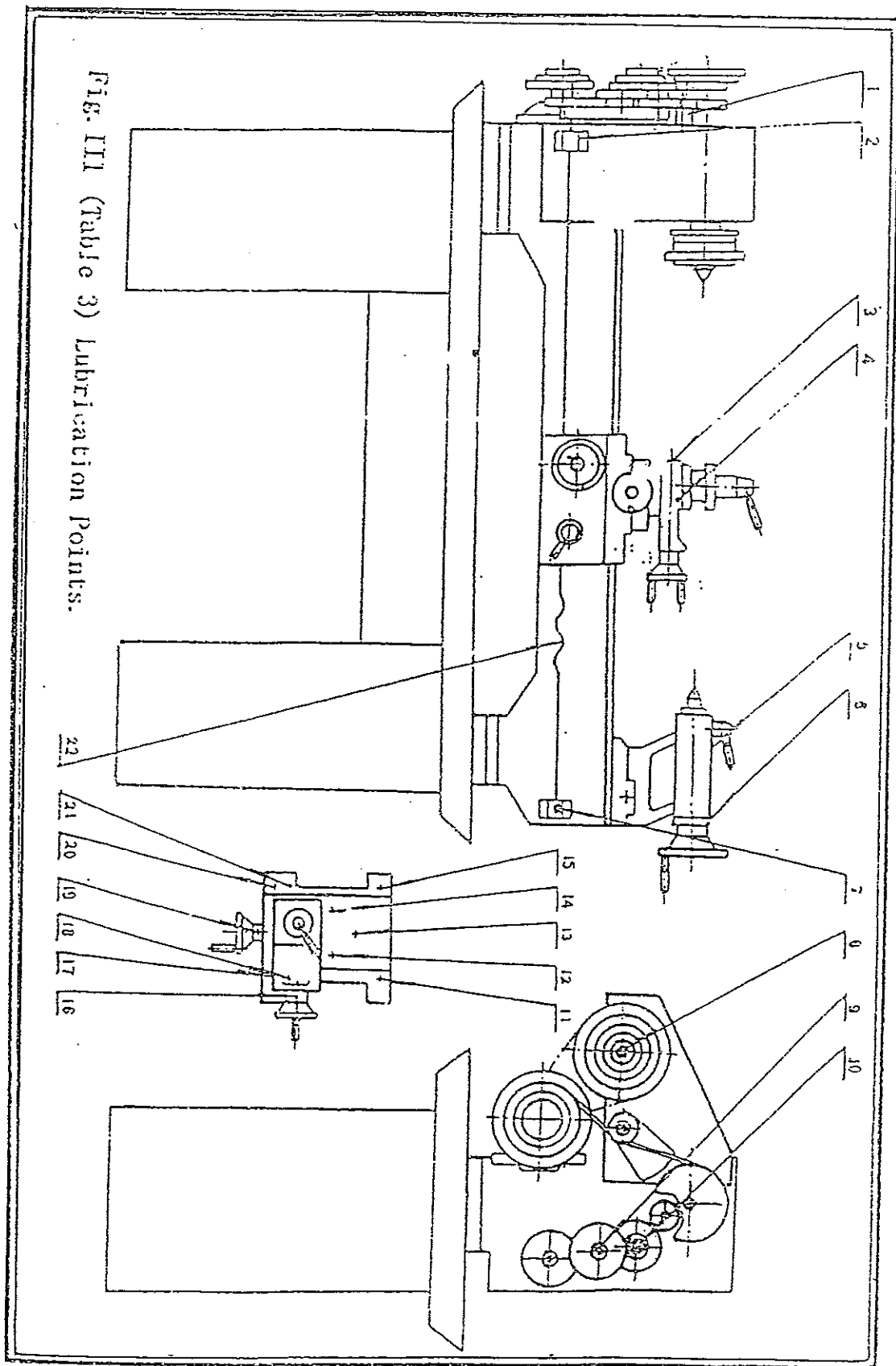


Fig. III (Table 3) Lubrication Points.

## XII. Lubrication system

See Fig.III(Table 3)

Lubricate the machine according to the lubricating schedule. This is to reduce abrasion of every slide part and let the machine be durable.

List of lubrication Points(Table 3)

item No. In Fig III	Part to be lubricated	Lubrication point	Lubrication period	Lubrication	Lubricating Tool
1	Fix Bolt of Intermediate Gear	Oil cup	Once Every Shift	NO.20machine oil	Force feed oil can
2	Leadscrew Support	Oil cup	Once Every Shift	NO.21machine oil	Forced feed oil can
3	Cutter Rest Screw.	Oil cup	Once Every Shift	NO.22machine oil	Forced feed oil can
4	Cutter Rest Carriage	Oil cup	Once Every Shift	NO.23machine oil	Forced feed oil can
5	Tailstock Sleeve	Oil cup	Once Every Shift	NO.24machine oil	Forced feed oil can
6	Tailstock Leadscrew	Oil cup	Once Every Shift	NO.25machine oil	Forced feed oil can
7	Leadscrew Support	Oil cup	Once Every Shift	NO.26machine oil	Forced feed oil can
8	synchronized counter pulley over shaft	Oil cup	Once Every Shift	NO.27machine oil	Forced feed oil can
9	Change Gear, Shaft Bolt	Oil cup	Once Every Shift	NO.28machine oil	Forced feed oil can
10	Change Gear, Shaft Bolt	Oil cup	Once Every Shift	NO.29machine oil	Forced feed oil can
11	Bed Guides	Oil cup	Once Every Shift	NO.30machine oil	Forced feed oil can
12	Saddle Carriage	Oil cup	Once Every Shift	NO.31machine oil	Forced feed oil can
13	Saddle leadscrew	Oil cup	Once Every Shift	NO.32machine oil	Forced feed oil can
14	Saddle Carriage	Oil cup	Once Every Shift	NO.33machine oil	Forced feed oil can
15	Bed Guides	Oil cup	Once Every Shift	NO.34machine oil	Forced feed oil can
16	Cutting Rest Leadscrew	Oil cup	Once Every Shift	NO.35machine oil	Forced feed oil can
17	Apron	Oil cup	Once Every Shift	NO.36machine oil	Forced feed oil can
18	Bed Guides	Oil cup	Once Every Shift	NO.37machine oil	Forced feed oil can
19	Saddle Carriage Leadscrew support	Oil cup	Once Every Shift	NO.38machine oil	Forced feed oil can
20	Apron	Oil cup	Once Every Shift	NO.39machine oil	Forced feed oil can
21	Bed Guides	Oil cup	Once Every Shift	NO.40machine oil	Forced feed oil can
22	Leadscrew	leadscrew	Once Every Shift	NO.41machine oil	Forced feed oil can

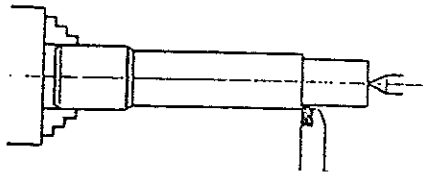
### xIII. Cutting Procedure Procedure for General Parts

#### 1. Preparation for Operation

- 1) Put the workpiece into the chuck, center the workpiece and clamp it.
- 2) Choose an appropriate tool, set it on the rest, let the tool nose in alignment with the spindle center line, then fix the tool.
- 3) Choose turn speed and feed amount according to the material, dimensions of the workpiece, the order requirements and the cutter material.
- 4) Adjust the belt and set change gears.
- 5) Start the motor and check if the lathe head and the feed amount is correct.

#### 2. Machining of Cylinders:

Complete the above steps first, then Turn



the apron handwheel to right side of the workpiece, push the tool nose with the handwheel to touch the workpiece and push down the hand lever the clasp-nut; Let the machine feed and cut automatically to the length, meanwhile checking the dimension.

#### 3. Machining of Cones:

The operation is The machine of cylinders, The comes can either be exterior or interior, there are two ways of machining.

##### 1) Manual

According to the taper requirement, turn the small cutter rest to a proper slops with the workpiece and fix it, repeat cutting with the

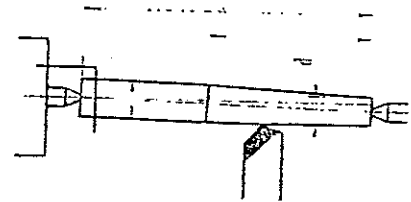
hand lever of the small cutter rest.

##### 2) automatic

taking advantage of the tailstock capability to swing right and left, the machine can be usde to machine long cones of small taper automatically. When doing this, fixing the workpiece with the two center heads. Horizontally move the tailstock from the spindle center line to the required slope with the workpiece.

$$S = L \times \sin \alpha$$

$$S = \frac{D-d}{2} \times \frac{L}{l}$$



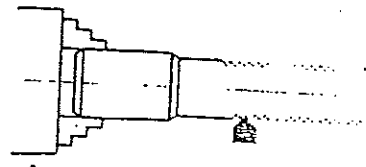
Automatically repeat cutting till completion.

#### 4. Machining of thread

1) Prepare tools before cutting, general thread specifications are 60° and 30° normal teeth or 30° trapezoidal teeth etc. Prepare the tool with a grinding wheel.

2) Set the change gears against the change gear table and the description in 800.

3) Cut the workpiece to outer diameter of the thread. Trial-cut the pitch and check it. If the result is satisfactory, repeat the cutting.



## XIV. Transportation & Installation

### 1. Transportation

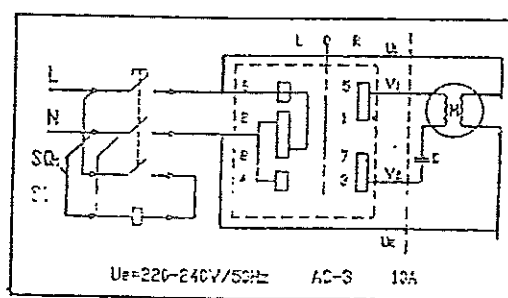
Care should be taken during handing and transportation to avoid violent impact and vibration. When hoisting, keep the machine poised and do not let the slings damage the guides, the spindle, handwheel and the painting.

### 2. Installation

As said before, this machine can be installed on a wood or an iron working table, but the four support point of the table must all firmly stand on the floor and the table must be leveled, so that there are will be less vibrations during cutting and the cutting accuracy can be maintained.

Wiring Diagram of 230V Control Circuit

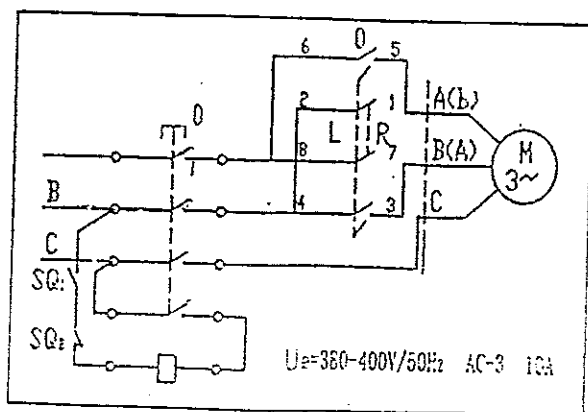
L	O	R
6-5	X	6×5
2×1	X	2-1
8×7	X	8-7
4-3	X	4×3
9-10	X	9-10



## XV. Electrical Diagram

Wiring Diagram of 400V Control Circuit

L	O	R
6-5	X	6×5
2×1	X	2-1
8×7	X	8-7
4-3	X	4×3
9-10	X	9-10



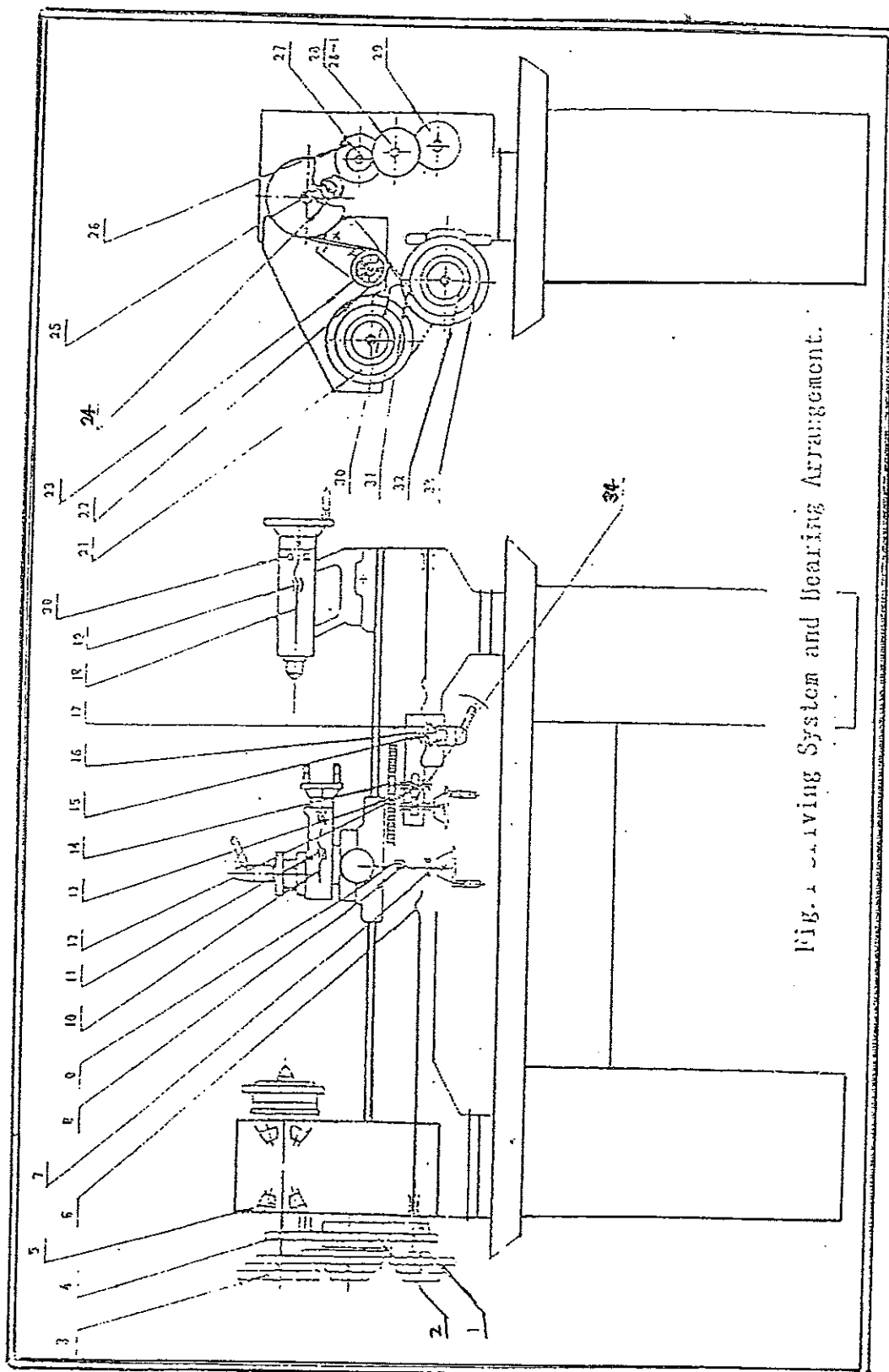


Fig. 1 Carving System and Bearing Arrangement.

Parts list of Drive System(Table 1)

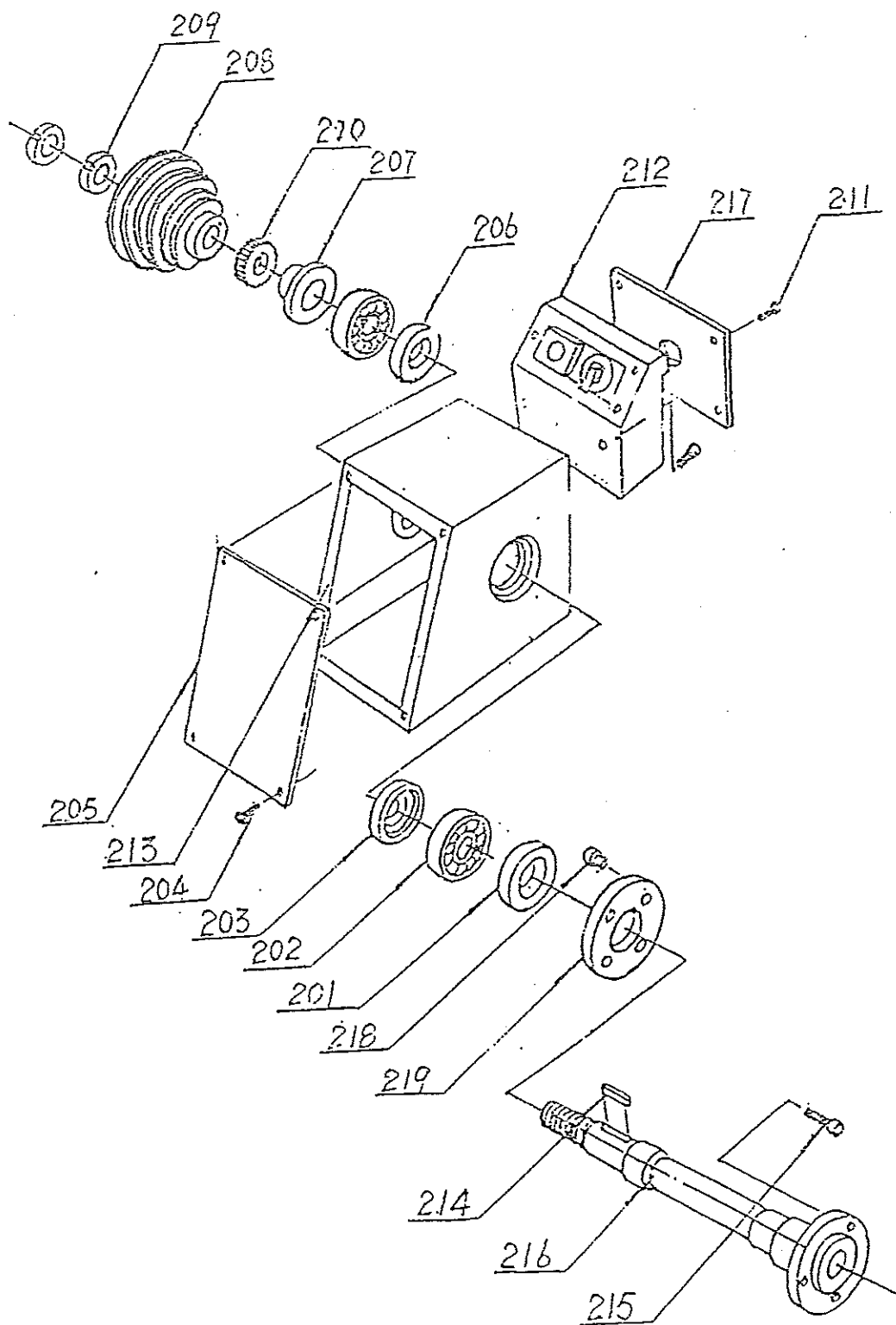
NO	components	No.of Teeth	Modular pitch	Hand of Thread	Dia. of Pulley	Compone ntNo.	Drawin g No.	Remarks
1	Synchronized drive Pulley	19	1.5			15	15024	
2	Change gear	25	1			08	08107	
3	Spindle pulley				$\phi 72/102/120$	02	02020	
4	Spindle gear	40	1			02	02021	
6	Lead screw		T20×2	Right		01	01005	
8	Clearance elimination nut		M14	Left		05	05014	
9	Carriage leadscrew		M14	Left		05	05013	
10	Cutter rest leadscrew		M8×1	Right		04	04018	
11	Cutter rest revolving dise		M8×1	Right		04	04011	
12	Gear	57	1			06	06016	
13	Rack		1.25			01	01009	
14	Gear shaft	17	1.25			06	06014	
15	Clasp nut		T20×2	Right		06	06017	
16	Slotted disc					06	06020	
17	Pin					06		Gb119-76 15×12
18	Tailstock leadscrew		M14	Left		03	03016	
19	Tailstock sleeve		M14	Left		03	03015	
21	Synchronized counter pulley	90	1.5		$\phi 51/72/100$	15	15023	
22	Tension pulley					15	15012	
24	Intermediate gear	40	1			08	08013	
26	Change gear	80	1			08	08019	
27	Change gear	33	1			08	08025	
28	Change gear	90	1			08	08032	
29	Change gear	90	1			08	08032	
30	Synchronized tooth belt	124	1.5			15		B=18
31	V-belt					15		0737
32	Motor pulley				$\phi 53/73/103$	15	05018	
33	Motor					15		JZ7134/ 550w
34	Pinion shaft	17	1			06	06013	

List of Rolling Bearing (Table.2)

Item No.on Fig.1	Name	Model No.	Specification	Qty	Componment No	Remarks
5	Single Row Taper Roller Bearing	2007107	35×60×17	2	200	Grade D
7	Single-direction Thrust ball bearing	8101	12×26×9	2	500	
20	Single Row Annular Bearing	8101	12×26×9	1	300	
23	Single Row Annular Bearing	101	12×28×8	2	1500	
25	Single Row Annular Bearing	101	12×28×8	1	800	

## Headstock

Item No.	Drawing No.	Name	Qty	Remarks
201	02014	Front Oil Ring	1	35×62×17
202	2002107	Roller Bearing	2	
203	02013	Oil Ring	1	M3×8
204	GB818-76	Screw	4	
205	02016	Frong Panel	1	
206	02014	Rear Oil Ring	1	
207	02015	Tube Separator	1	
208	02020	Spindle Pulley	1	
209	GB812-76	Nut	2	M27×1.5
210	02021	Spindle Gear	1	
211	GB70-85	Screw	4	M5×10
212		Switch box	1	
213	02011	Headstock	1	
214	GB1096-79	Flat Key	1	4×40
215	GB70-76	Screw	3	M6×16
216	GB70-76	Spindle	1	
217	02012	Cover	1	
218		Screw	3	M6×16
219	02018	Rotable spacer	1	

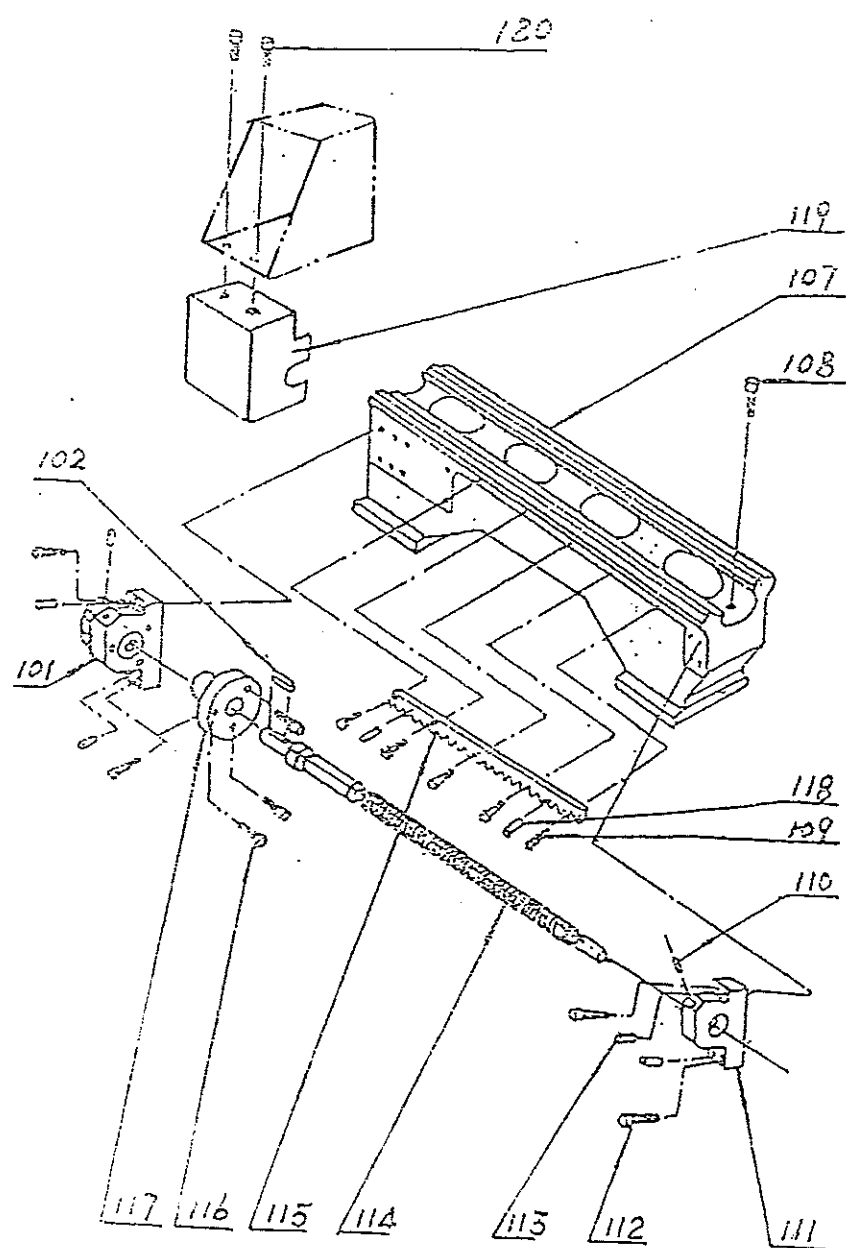


Component Drawing 200. \*Headstock.



# Bed

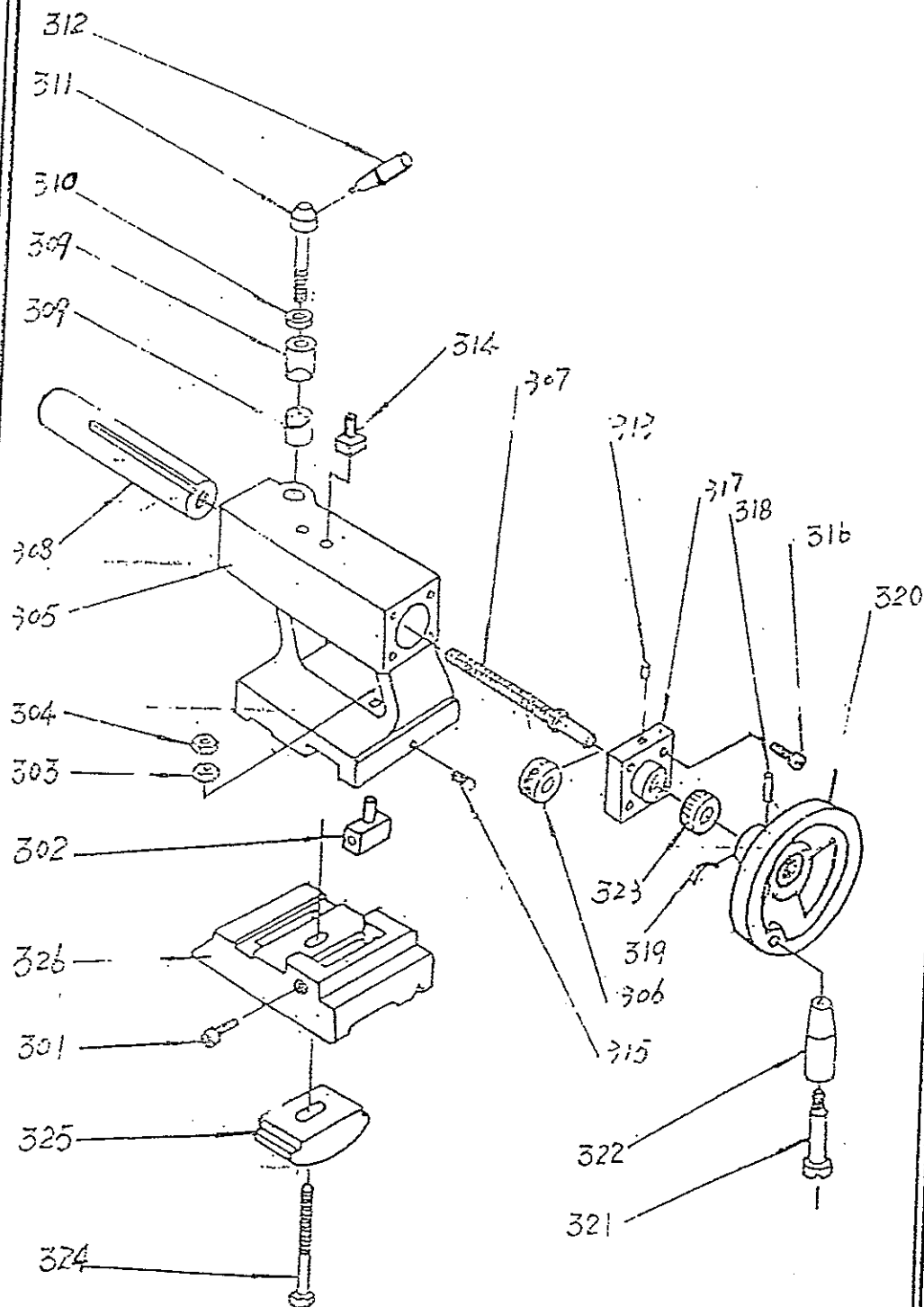
Item No.	Drawing No.	Name	Qty	Remarks
101	01012	Left Support of lead Screw	1	
102	GB1096-79	Flat Key	1	4×6
103	GB818-85	Screw	4	M63×6
104	01007	Cover	1	×
105	GB818-85	Screw	4	M4×6
106	01006	Case	1	
107	01011	Bed	1	A 400B/555
108	GB70-85	Screw	1	M8×12
109	GB819-85	Screw	A/4 B/5	M5×16
110	R71-1	Oil Cup	2	
111	01018	Right Support of lead Screw	1	
112	GB70-85	Screw	4	M6×16
113	GB818-85	Laer-pin	4	6×22
114	01015	Lead Screw	1	
115	01019	Rack	1	
116	GB70-85	Screw	3	M4×16
117	01014	Adjusting Disc	1	
118	GB879-86	Spring pin	2	5×16
119		Cover	1	
120	GB70-85	Screw	2	M6×16



Component Drawing No.100. Bed.

## Tailstock

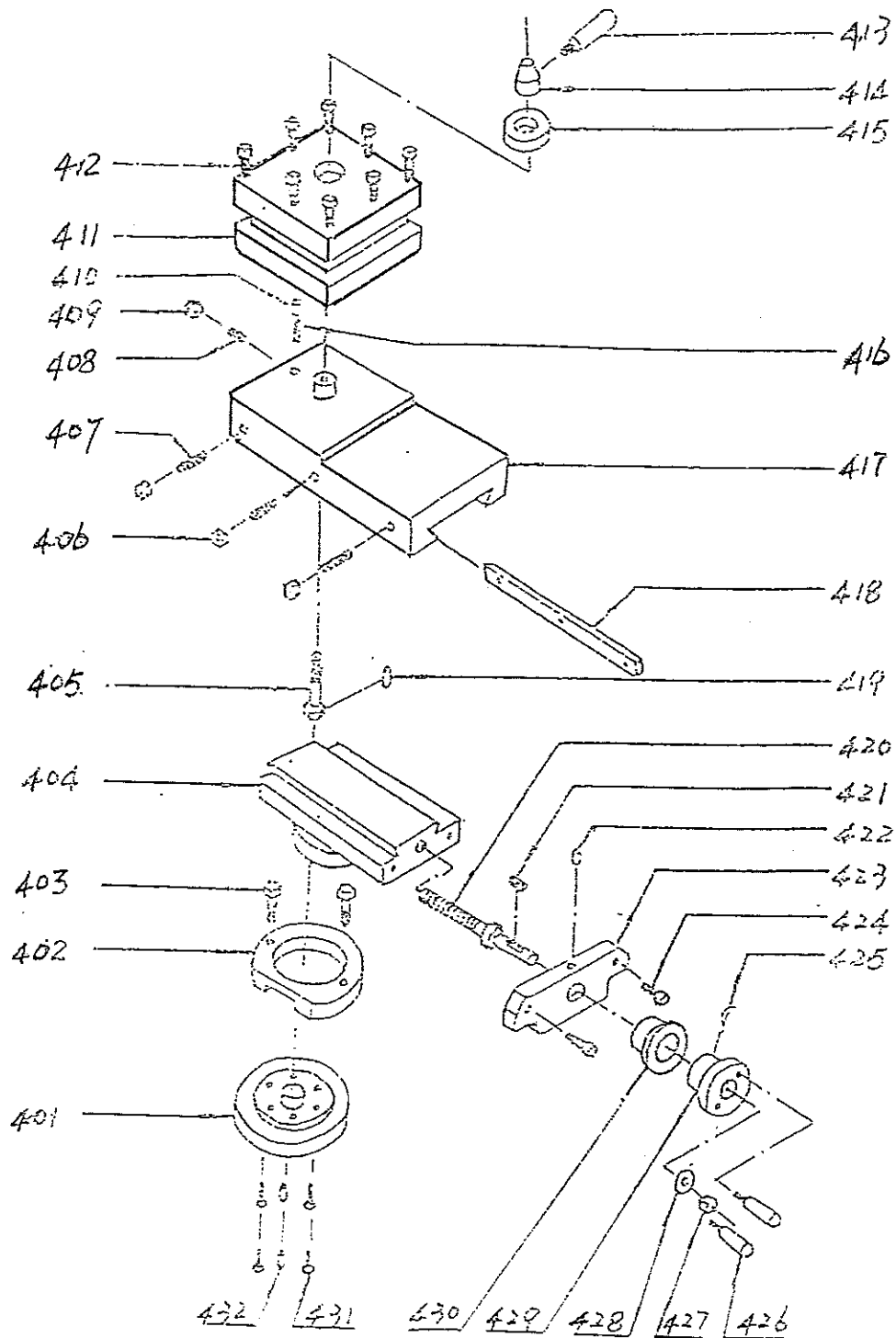
Item No.	Drawing No.	Name	Qty	Remarks
301	GB70-76	Screw	2	M8×20
302	03013	Nut	1	
303	GB97-76	Washer	1	B12
304	GB55-76	Nut	1	M12
305	03011	Tailstock Body	1	
306	8101	Single Row Radial Ball Bearing	1	12×26×29
307	03016	Tailstock Leadscrew	1	
308	03015	Tailstock Sleeve	1	
309	03020	Tubular clamp	1 set	
310	GB79-76	Washer	1	B8
311	03021	Bolt	1	
312	03022	Hand Lever	1	
313	R71-1	Force Feed Oil Cup	2	6
314	03019	T-type Flat Key	1	
315	GB75-76	Screw	1	M6
316	GB70-76	Screw	4	M5×16
317	03017	Tailstock End Cover	1	
318	GB879-76	Cylinder Pin	1	4×30
319	04022	Spring Bow	1	
320	03018	Handwheel	1	
321	06027A	Hand Lever Bolt	1	
322	06027	Hand Lever Sleeve	1	
323	04021	Index Ring	1	
324	GB8-76	Bolt	1	M12×100
325	03014	Tailstock Clamp Plate	1	
326	03012	Base	1	



Component Drawing No. 300. Tailstock.

# Rest

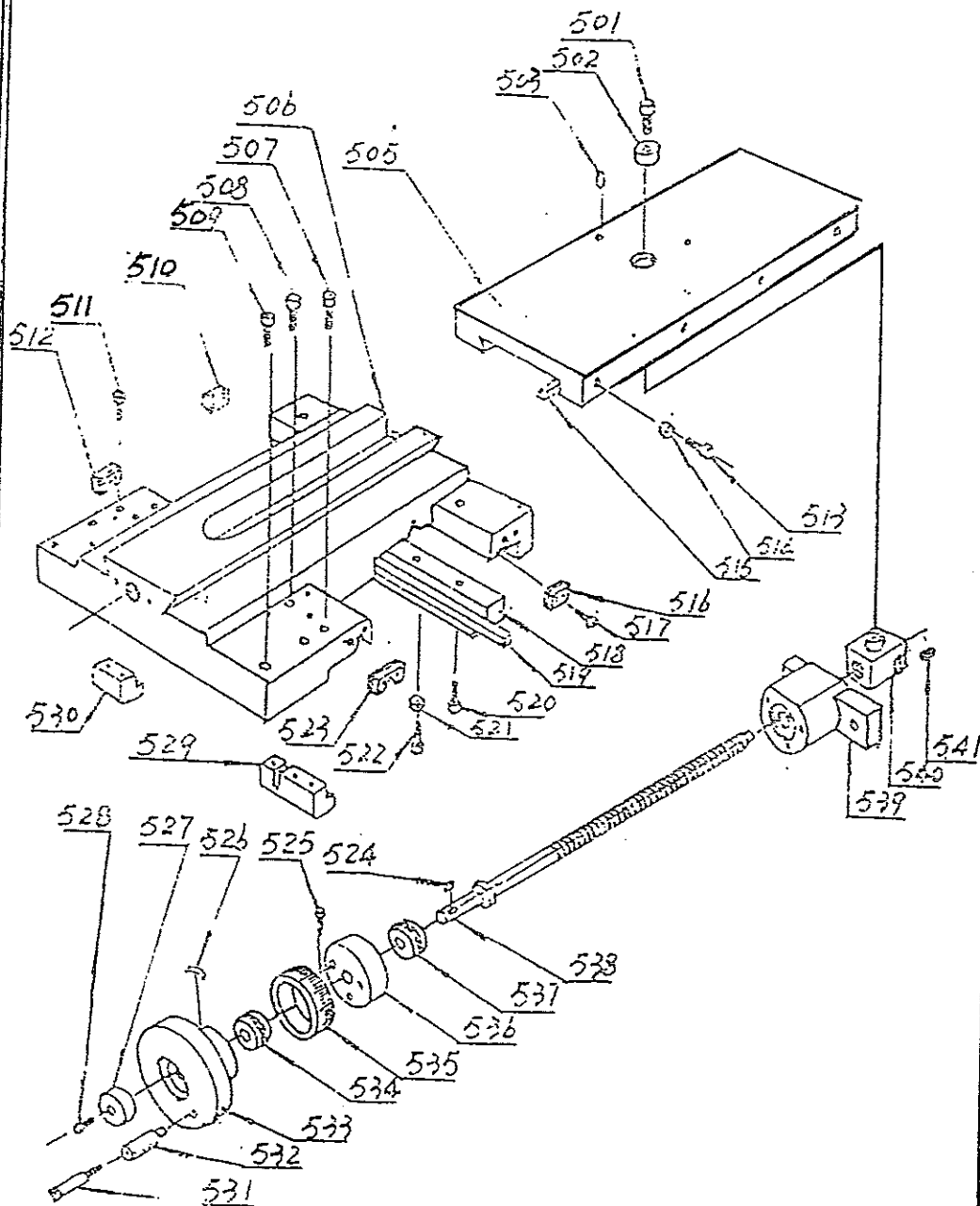
Item No.	Drawing No.	Name	Qty	Remarks
401		Base	1	
402	04025	Index piece	1	
403	GB30-76	Bolt	2	M8×20
404	04011	Cutter Rest Revolving Disc	1	
405	04015	Rest Bolt	1	
406	GB54-76	Nut	1	
407	GB75-76	Screw	3	M4
408	GB75-76	Screw	3	M4×20
409	GB54-76	Nut	1	M4×12
410	04014	Position pin	1	M4
411	01013	Square Cutter Rest	1	
412	GB85-76	Screw	1	
413	03022	Hand lever	8	M8×25
414	04017	Hand lever Base	1	
415	04016	Washer	1	
416	Q81-1	Spring	1	
417	04012	Cutter Rest Carriage	1	
418	04026	Pad Iron	1	
419	GB879-76	Cylinder Pin	1	3×10
420	04018	Cutter Rest Carriage Lead	1	
421	GB1096-79	Flat Key	1	3×10
422	R71-1	Oil Cup	2	6
423	04020	Leadscrew Support	1	
424	GB70-76	Screw	2	M5×16
425	04022	Spring Bow	1	
426	04023B	Hand Lever	2	
427	GB52-76	Nut	1	M8
428	GB97-76	Washer	1	B8
429	04023	Cutter Rest Carriage Hand Wheel	1	
430	04021	dial Ring	1	
431	GB65-76	Screw	4	M6×22
432	GB879-76	Cylinder Pin	2	4×16



Component Drawing No. 400. Rest.

## Saddle

Item No.	Drawing No.	Name	Qty	Remarks
501	05018	Screw	1	M5×10
502	R71-1	Washer	1	
503	GB1096-79	Oil cup	9	
505		Middle Saddle	1	
506		Large saddle	1	
507	GB70-85	Screw	4	M5×20
508	GB70-85	Screw	1	M8×20
509	GB70-76	Screw	4	M6×35
510		Protecting panel and oil-stopping falt	1	
511	GB71-76	Screw	2	M8×10
512		Protecting panel and oil-stopping falt	1	
513	GB75-76	Screw	4	M5×25
514	GB52-76	Nut	4	M5
515		Pad Iron	1	
516		Protecting panel and oil-stopping falt	1	
517	GB67-76	Screw	8	M3×12
518		Rear-clamp plate	1	
519		Pad Iron	1	
520	GB70-76	Screw	4	M5×16
521	GB54-76	Nut	5	M4×16
522	GB75-76	Screw	5	M4×16
523		Protecting panel and oil-stopping falt	1	
524	GB1096-86	Flat key	1	4×8
525	GB76-85	Screw	3	M5×22
526		Spring Bow	1	
527		Washer	1	
528	GB70-85	Screw	1	M6×10
529		Bracking plate	1	
530		Saddle front-clamp plate	1	
531		Hand lever bolt	1	
532		Hand lever sleeve	1	
533		Hand wheel	1	
534		Rolling Bearing	1	8101
535		Index Ring	1	100 Ruled
536		Bearing base	1	0.02min
537		Rolling Bearing	1	8101
538		Leadscrew	1	10TP1
539		Leadscrew support	1	
540		Nut	1	10TP1
541	GB75-76	Screw	2	M3×16
542	GB70-85	Screw	2	M8×20

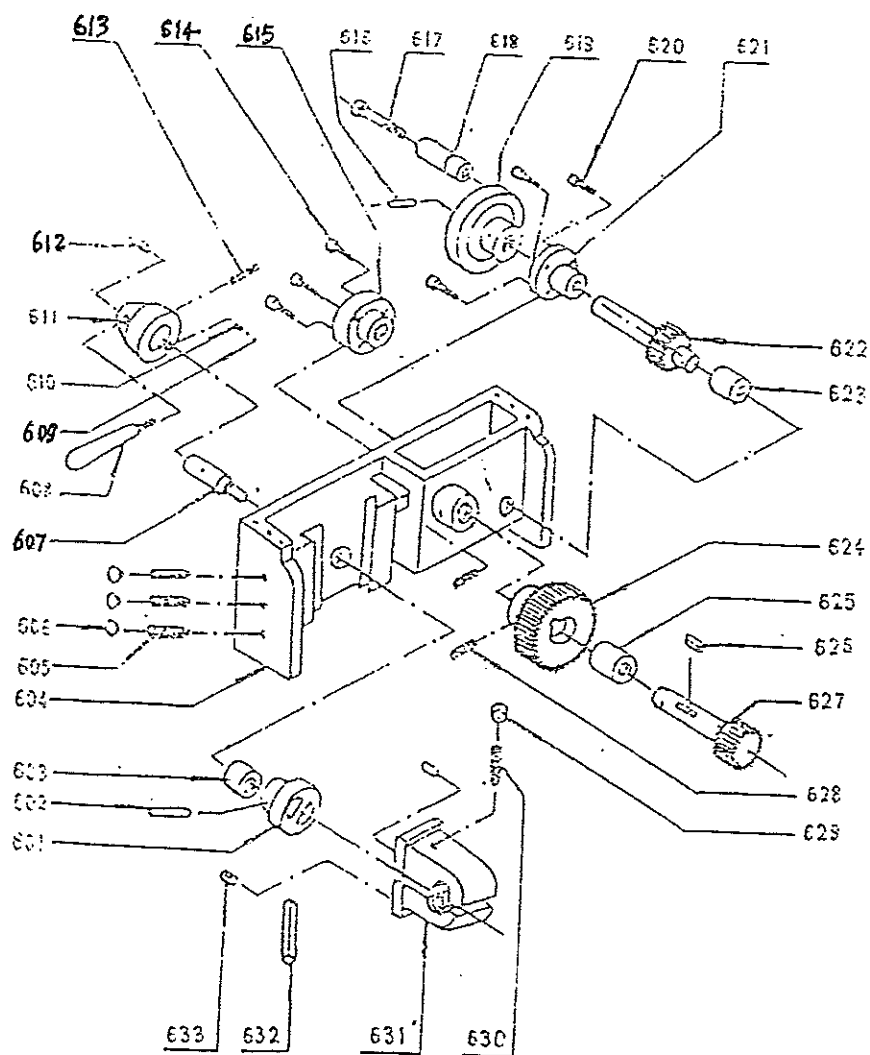


Component Drawing No. 500. Saddle.



## Apron

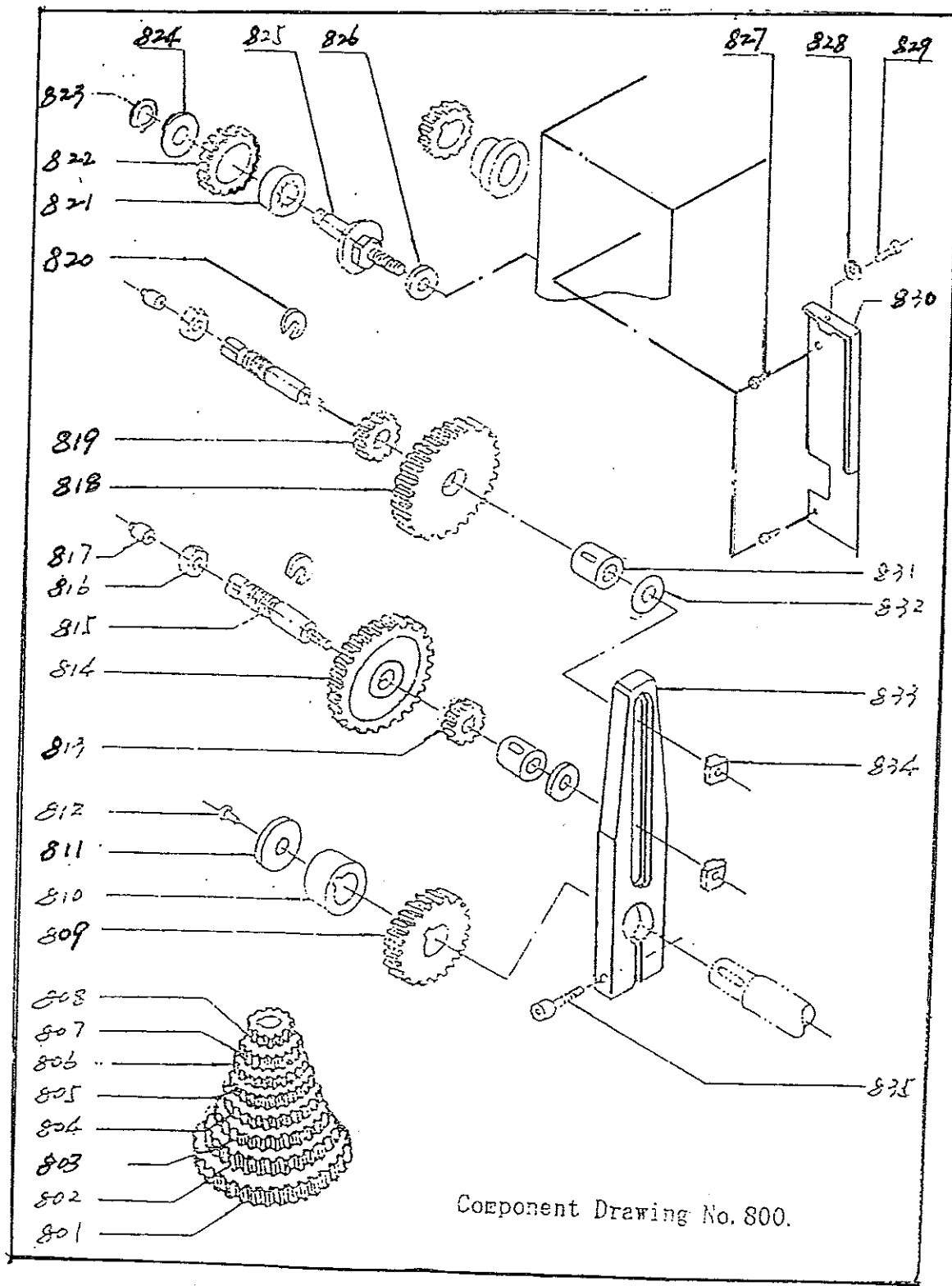
Item No.	Drawing No.	Name	Qty	Remarks
601	06020	Slotted Disc	1	3×20
602	GB117-76	Taper Pin	1	
603	0612	Shaft Sleeve	1	
604	0611	Case	1	
605	GB75-76	Bolt	3	M5×30
606	GB54-76	Nut	3	M5
607	06021	Revolving Shaft	1	
608	03022	Hand Lever	1	Shared piece
609	GB308-77	Steel Ball	1	5
610	Q81-76	Spring	1	08×5×25
611	06026	Positioning Lever	1	
612	GB73-76	Screw	1	M6×10
613	GB73-76	Screw	1	M6×20
614	GB70-76	Screw	3	M4×8
615	06024	Flanged Shaft sleeve	1	
616	GB117-76	Taper Pin	1	3×30
617	06027A	Hand Lever Sleeve	1	
618	06027	Hand Lever Sleeve	1	
619	06018	Hand wheel	1	Shared piece
620	GB70-76	Screw	3	M4×8
621	06025	Small Flanged Shaft Sleeve	1	
622	06013	Small Gear Shaft	1	
623	06012	Shaft Sleeve	1	
624	06016	Gear	1	
625	0615	Shaft Sleeve	1	
626	GB096-79	Flat Key	1	5×10
627	06014	Gear Shaft	1	
628	GB71-76	Screw	2	M4×8
629	GB54-76	Nut	1	M5×30
630	GB73-76	Screw	1	M5×25
631	06017	Clap-nut	1 set	
632	06019	Pad Iron	1	
633	GB1019-76	Cylindrical Pin	2	5×12



Component Drawing No. 600. Apron.

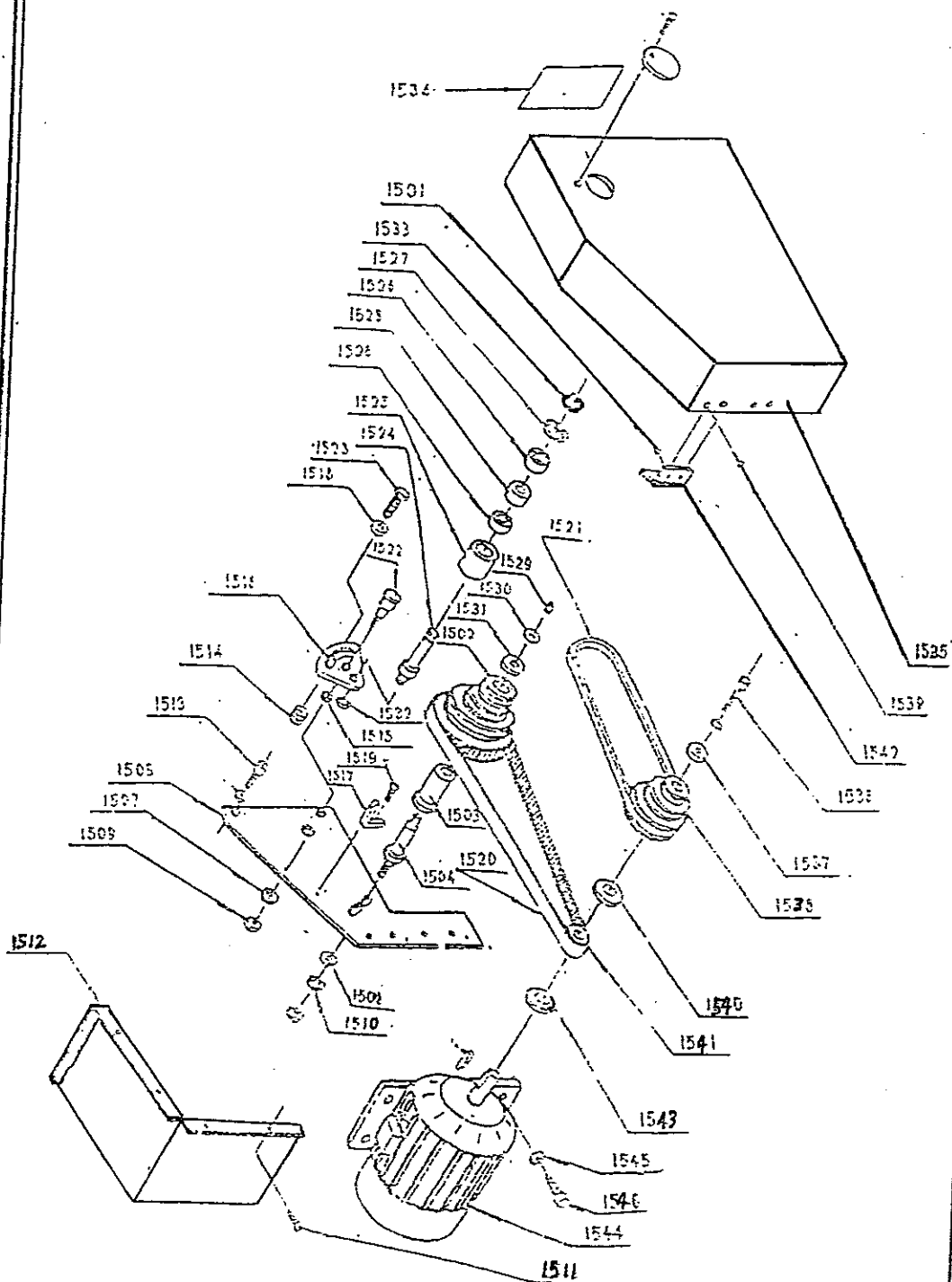
## Change Gear Box

Item No.	Drawing No.	Name	Qty	Remarks
801		Change Gear	2	Z90
802		Change Gear	1	Z80
803		Change Gear	1	Z70
804		Change Gear	1	Z50
805		Change Gear	1	Z50
806		Change Gear	1	Z42
807		Change Gear	1	Z40
808		Change Gear	1	Z33
809		Change Gear	1	Z60
810	08029	Washer	1	
811	GB894-79	Check Ring	1	6
812	GB68-76	Screw	1	M5×8
m5^813	08017	Change Gear	1	Z25
814	08028	Change Gear	1	Z75
815	08016	Shaft Bolt	2	
816	GB52-76	Nut	2	M12
817	R71-1	Oil Cup	3	6
818	08024	Change Gear	1	
819	08021	Change Gear	1	
820	08037	Open Washer	2	
821	101	Rolling Bearing	1	12×28×8
822	08013	Intermediate Gear	1	Z40
823	GB894-76	Check Ring	1	Z12
824	08036	Outer Washer	1	
825	08012	Intermediate Bolt	1	
826	08012B	Washer	1	10
827	GB818-85	Screw	2	M5×8
828	Gb97-76	Washer	1	6
829	Gb65-76	Screw	1	M6×10
830	08035	Cover	1	
831	08030	Slide Bearing	2	
832	08038	Washer	3	
833	08033	Change Gear Box	1	
834	08031	Square Nut	2	
835	GB70-76	Screw	1	M6×35



## Motor & Pulley Drive

Item No.	Drawing No.	Name	Qty	Remarks
1501	GB52-76	Nut	3	M5
1502	15023	Synchronized Counter Pulley	1	
1503	15021	Slide Bearing	1	
1504	15020	Shaft	1	
1505	15022	Over Plate	1	
1506	GB96-76	Washer	1	12
1507	GB97-76	Washer	1	10
1508	GB52-76	Nut	1	M12
1509	GB52-76	Nut	1	M10
1510	GB54-76	Nut	1	M12
1511	GB818-76	Screw	4	M5×8
1512	15027	Motor Guard Assembly	1	
1513	GB30-76	Bolt	3	M10×10
1514	15025	Washer	1	
1515	15016	Washer	1	
1516	15026	Fan-support	1	
1517	15030	Protecting Cove Rest	1	
1518	GB97-76	Washer	1	8
1519	GB818-76	Screw	2	M5×12
1520		Synchronized Tooth Belt	1	M1.5×Z124
1521		v-belt	1	O-762
1522	15015	Pivot	1	
1523	GB30-76	Bolt	1	M8×20
1524	15014	Bearing Arbor	1	
1525	15012	Tension Pulley	1	
1526	101	Single Row Annular Bearing	2	12×28×8
1527	GB894-76	Check Ring	1	12
1528	15013	Tube Separator	1	
1529	R71-1	Front Feed Oil Cup	1	6
1530	GB894-76	Check Ring	1	12
1531	15031	Big Washer	1	
1532	GB894-76	Check Ring	1	12
1533	GB893-76	Check Ring	1	28
1534	15029A	Front Panel	1	
1535	15028	Cover	1	
1536	GB70-76	Screw	1	M5×35
1537	15017	Check Ring	1	
1538	15018	Motor Pulley	1	
1539	GB818-76	Screw	5	M5×8
1540	15024-1	Check Ring	1	
1541	15024	Synchronized Drive Pulley	1	
1542		Hinge	2	75
1543		Check Ring	1	
1544	JZ7134	Motor	1	550W
1545	GB97-76	Washer	4	8
1546	GB30-76	Bolt	4	M8×25



Component Drawing No. 1500 Motor and Pulley.