



中等职业学校机电类规划教材
专业基础课程与实训课程系列

机电专业英语

朱丽芬 主编



English

 人民邮电出版社
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内 容 提 要

本书是一本机电专业基础英语教材, 全书共分 4 个单元, 分别从与机电专业密切相关的传统制造技术、现代制造技术、电工电子基础、常用应用文等 4 个领域来介绍既简单又实用的机电专业英语知识。书中内容知识面广, 技术新, 并附有详实的图文, 以增强教学内容的直观性。每课配有拓展阅读内容, 以丰富读者的专业知识, 还配有名人名言警句, 以激励读者学习。书后附录中配有参考译文、词汇表, 以方便读者自学。

本书可作为三年制中等职业学校机电专业英语教材, 也可作为机电专业英语自学参考书。

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我国加入 WTO 以后,国内机械加工行业和电子技术行业得到快速发展。国内机电技术的革新和产业结构的调整成为一种发展趋势。因此,近年来企业对机电人才的需求量逐年上升,对技术工人的专业知识和操作技能也提出了更高的要求。相应地,为满足机电行业对人才的需求,中等职业学校机电类专业的招生规模在不断扩大,教学内容和教学方法也在不断调整。

为了适应机电行业快速发展和中等职业学校机电专业教学改革对教材的需要,我们在全国机电行业和职业教育发展较好的地区进行了广泛调研;以培养技能型人才为出发点,以各地中职教育教研成果为参考,以中职教学需求和教学一线的骨干教师对教材建设的要求为标准,经过充分研讨与论证,精心规划了这套《中等职业学校机电类规划教材》,第一批教材包括三个系列,分别为《专业基础课程与实训课程系列》、《数控技术应用专业系列》、《模具设计与制造专业系列》。

本套教材力求体现国家倡导的“以就业为导向,以能力为本位”的精神,结合职业技能鉴定和中等职业学校双证书的需求,精简整合理论课程,注重实训教学,强化上岗前培训;教材内容统筹规划,合理安排知识点、技能点,避免重复;教学形式生动活泼,以符合中等职业学校学生的认知规律。

本套教材广泛参考了各地中等职业学校的教学计划,面向优秀教师征集编写大纲,并在国内机电行业较发达的地区邀请专家对大纲进行了多次评议及反复论证,尽可能使教材的知识结构和编写方式符合当前中等职业学校机电专业教学的要求。

在作者的选择上,充分考虑了教学和就业的实际需要,邀请活跃在各重点学校教学一线的“双师型”专业骨干教师作为主编。他们具有深厚的教学功底,同时具有实际生产操作的丰富经验,能够准确把握中等职业学校机电专业人才培养的客观需求;他们具有丰富的教材编写经验,能够将中职教学的规律和学生理解知识、掌握技能的特点充分体现在教材中。

为了方便教学,我们免费为选用本套教材的老师提供教学辅助光盘,光盘的内容为教材的习题答案、模拟试卷和电子教案(电子教案为教学提纲与书中重要的图表,以及不便在书中描述的技能要领与实训效果)等教学相关资料,部分教材还配有便于学生理解和操作演练的多媒体课件,以求尽量为教学中的各个环节提供便利。

我们衷心希望本套教材的出版能促进目前中等职业学校的教学工作,并希望能得到职业教育专家和广大师生的批评与指正,以期通过逐步调整、完善和补充,使之更符合中职教学实际。

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本书是由职业教育一线工作者根据当前机电专业人才培养目标和需求编写而成的一本专业英语教材。

全书共分4个部分，内容分别涉及传统制造技术、现代制造技术、电工电子基础和常用应用文等。每课配有以下栏目：课文和拓展阅读内容，以满足读者的阅读需求；难句注释、词汇分析，以方便读者正确理解课文内容；练习巩固，形式多样，并附有小组合作项目，以培养学生合作学习能力；名人名言警句，以激励读者树立正确的人生观。书后附录中配有参考译文、词汇表，以方便读者自学。

本书的编写特色是：

- (1) 图文并茂，力求增强教学的直观性，降低学习难度，提高趣味性；
- (2) 强调词汇积累，淡化语法教学；
- (3) 引用最新应用实例，体现教学内容的实时性；
- (4) 内容丰富，形式多样。

本书适用于三年制中等职业学校机电专业学生，也可作为工矿企业业余学校相应专业员工培训的英语教材，为了使读者能在较短的时间内达到阅读机电专业英语资料的能力，本书在内容编排上力求密切联系实际，所选的题材、词汇尽可能与机电专业相结合，由浅入深，删繁就简。读者可根据专业趋向差异，有方向性地选择学习内容，如机械专业的读者可以前面两部分为主要教学内容，把第三模块部分内容作为选学；电工电子专业读者可把前两部分内容作为选学内容，详读第3部分内容等。

本教材按60学时编写，建议各章的课时数分配如下：

序 号	课 程 内 容	学 时 分 配		
		授 课	训 练	合 计
Section 1	Introduction to Manufacturing	12	4	16
Section 2	Modern Manufacturing Technology	12	6	18
Section 3	Electron and Electrician	10	4	14
Section 4	Application	6	6	12
合 计		40	20	60

本书由浙江省余姚市职教中心学校朱丽芬老师担任主编。Section1、3、4 由朱丽芬和浙江省余姚中学王爱娣老师编写，Section2 由无锡职业技术学院黎雪芬老师编写，浙江省余

姚市实验学校邵利群、浙江省余姚市职成教教研室刘国芳老师参与了译文的编写工作。本书由无锡职业技术学院宋新萍老师担任主审，镇江机电高等职业技术学校杨帆老师、浙江省庆元县职业高级中学叶忠林老师、广东省高级技工学校马玮老师进行了全书审校工作，提出了许多宝贵的意见，在此一并表示衷心的感谢。

由于编者水平有限，书中疏漏和错误之处在所难免，恳请广大读者给予批评指正。

编 者
2006 年 11 月

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Section 1

Introduction to Manufacturing

第一部分 传统制造技术



Lesson 1

Can You Recognize Them

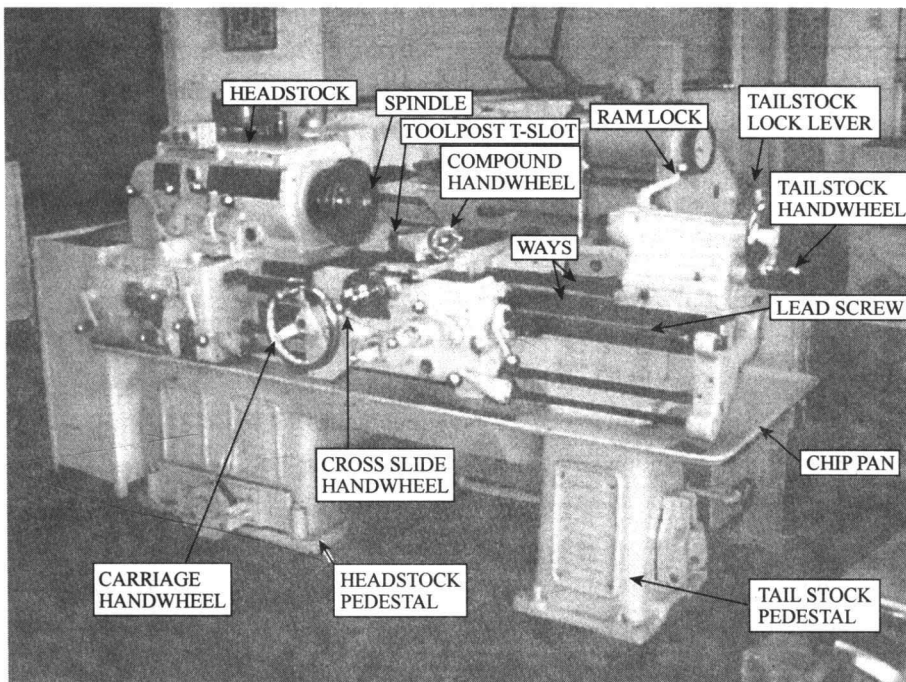


Figure 1.1 Lathe

The purpose of a lathe is to rotate a part against a tool whose position it controls. It is useful for fabricating parts or features that have a circular cross section. Such as figure 1.1. The spindle is the part of the lathe that rotates. Various workholding attachments such as three jaw chucks, collets, and centers can be held in the spindle.

The spindle is driven by an electric motor through a system of belt drives or gear trains. Spindle speed is controlled by varying the geometry of the drive train.

The tailstock can be used to support the end of the workpiece with a center, or to hold tools for drilling, reaming, threading, or cutting tapers. It can be adjusted in position along the ways to accommodate different-length workpieces.

The figure 1.2 shows what the lathe can do.

Milling is the process of cutting away materials by feeding a workpiece past a rotating multiple teeth cutter. The cutting action of the many teeth around the milling cutter provides a fast method of machining. The machined surface may be flat, angular, or curved. The surface may also be milled to any combination of shapes.

Milling can be classified into peripheral milling, face milling and end milling. The figure 1.3 shows some of milling machining, and figure 1.4 shows milltng operation.

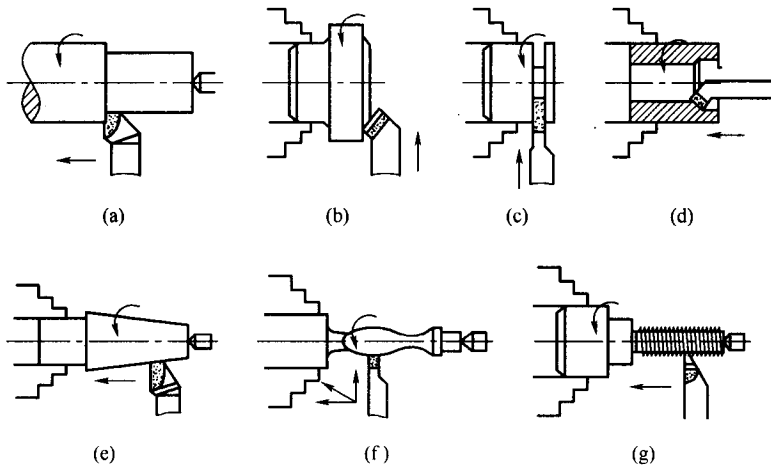


Figure 1.2 Turning

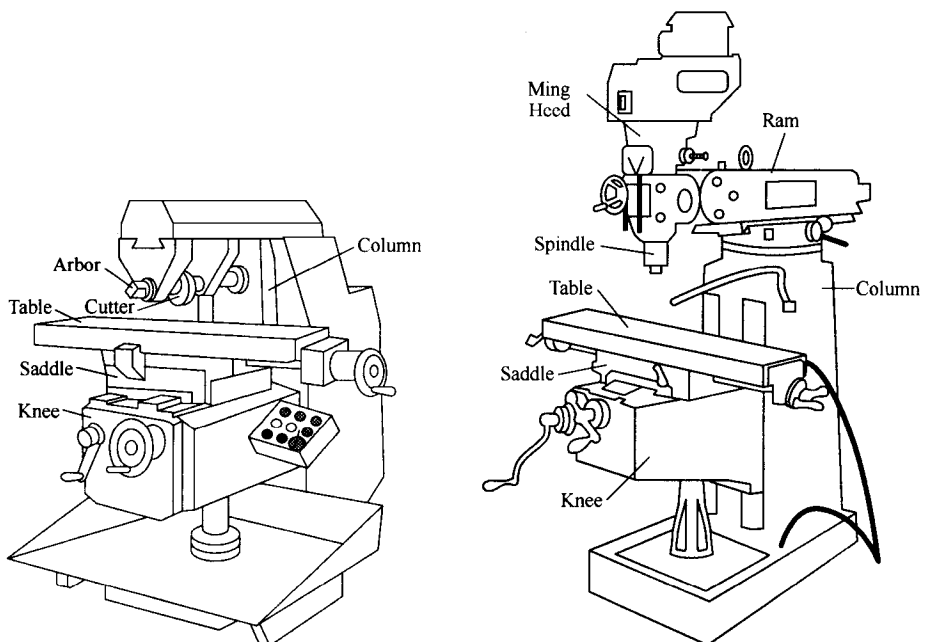


Figure 1.3 Milling Machining

Shapers and planers are the most commonly-used planer machining. Such as figure 1.5 and figure 1.6. The machined surface may be big flat, groove, or curved.



Section 1 Introduction to Manufacturing

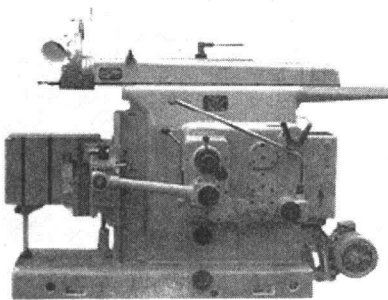
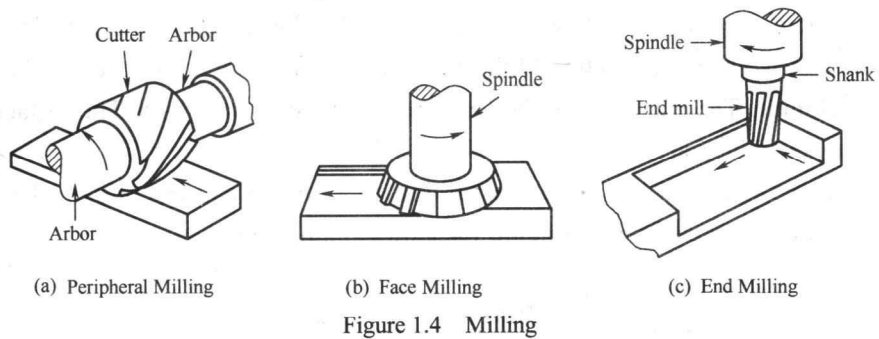


Figure 1.5 Shaping Machine

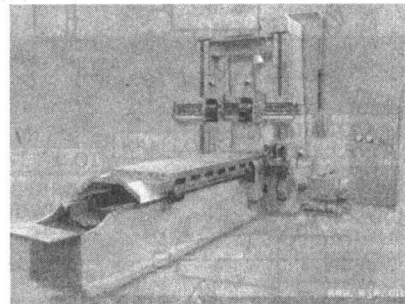


Figure 1.6 Planer Machine

Grinding is a process of material removal in which a wheel composed of many hard abrasive grits wears away a softer material. Such as figure 1.7 and figure 1.8, figure 1.9. Almost any material can be ground—aluminum, steel, ceramics, even diamond or glass. The grinding surface may be cylindrical, hole, flat, thread, gear, etc.

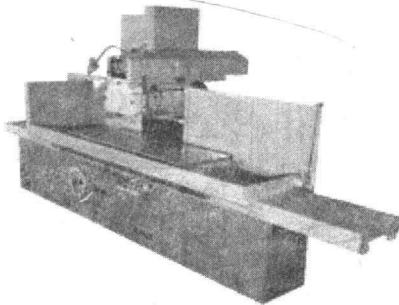


Figure 1.7 Grinding Machine

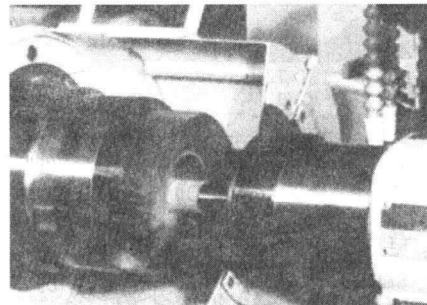


Figure 1.8 High-speed Hole Grinding

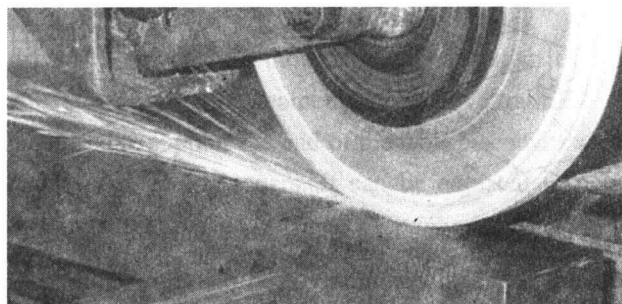


Figure 1.9 Grinding



Drilling is a process using a rotating drill cutting a round hole. It can be classified into table drilling machine, Such as figure 1.10, upright drilling machine, radial drilling machine. They can finish drill, enlarge holes, reaming, screw thread, or to shave a surface. Such as figure 1.11.

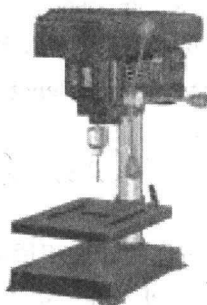


Figure 1.10 Drilling Machine

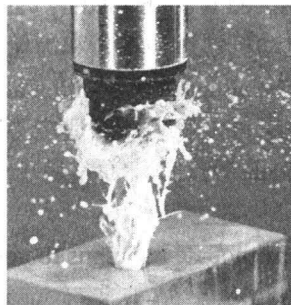


Figure 1.11 Drilling

Key Words

- lathe [leɪð] n. 车床 vt. 用车床加工
 milling machining 铣床
 planer machining 刨床
 grinding machine 磨床
 turning ['tə:niŋ] n. 旋转, 车削
 drill [drɪl] n. 钻床, 钻头 v. 钻孔
 drilling machine 钻床
 hole [həʊl] n. 洞, 孔
 surface ['sə:fɪs] n. 表面, 外表
 gear [giə] n. 齿轮, 传动装置 v. (使) 适合, 换挡
 milling ['mɪlɪŋ] n. 铣 (削), 铣削法; 铣出的齿边
 grinding ['graɪndɪŋ] n. 磨削
 planing n. 刨削 (动词原形为 plane)
 drilling ['drɪlɪŋ] n. 钻削
 cylindrical [sɪ'lɪndrɪk(ə)l] adj. 圆柱体的
 flat [flæt] n. 平面
 thread [θred] n. 螺纹

Notes

1. The purpose of a lathe is to rotate a part against a tool whose position it controls.
 车削加工的目的是用相对固定位置的刀具加工一个旋转的工件。



against 在此处为介词，意为“触”，“碰”，“靠”等。

whose position it controls 为定语从句，修饰先行词 tool。whose 相当于 of which。

2. The spindle is driven by an electric motor through a system of belt drives and gear trains. Spindle speed is controlled by varying the geometry of the drive train.

主轴由电动机通过传动带和齿轮系驱动，主轴速度通过改变驱动系的结构进行控制。

3. It can be adjusted in position along the ways to accommodate different-length workpieces.

尾座的位置可以调整，以适应不同长度工件的加工。

accommodate 为动词，通常用于 accommodate sth. to sth. 的句型中，意为“适应”，“迁就”，“迎合”。如：

I will accommodate my plans to yours. 我修改一下计划以便与你的计划相适应。

4. Grinding is a process of material removal in which a wheel composed of many hard abrasive grits wears away a softer material.

磨削是用许多硬的磨粒附着在较软的材料上所制成的砂轮进行切削加工的方法。

in which a wheel composed of many hard abrasive grits wears away a softer material 为定语从句，修饰先行词 process。

composed of many hard abrasive grits 为过去分词短语作定语，修饰 wheel。

compose 为及物动词，意为“组成，构成”，常用于“be composed of”这一结构中，表示“由……组成”。

5. Drilling is a process using a rotating drill cutting a round hole. It can be classified into table drilling machine, upright drill machine, radial drilling machine.

钻削是用旋转的钻头在工件上加工孔的工艺过程。常用的钻床有台式钻床、立式钻床和摇臂钻床。

classify 是及物动词，意为“将……分类或归类”。

be classified into 意为“被分成……”。

Learn More

Methods of Milling

Up Milling

Up milling is also referred to as conventional milling. The direction of the cutter rotation opposes the feed motion. For example, if the cutter rotates clockwise, the workpiece is fed to the right in up milling. Shown in figure 1.12.

Down Milling

Down milling is also referred to as climb milling. The direction of cutter rotation is the same as the feed motion. For example, if the cutter rotates counterclockwise, the workpiece is fed to the right in down milling. Shown in figure 1.13.



The chip formation in down milling is opposite to the chip formation in up milling. The figure 1.13 shows that the cutter tooth is almost parallel to the top surface of the workpiece. The cutter tooth begins to mill the full chip thickness. Then the chip thickness gradually decreases.

Other milling operations are shown in the figure 1.14.

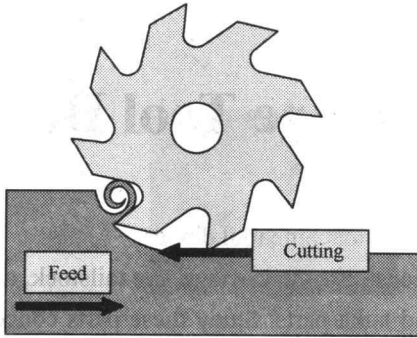


Figure 1.12 Up Milling

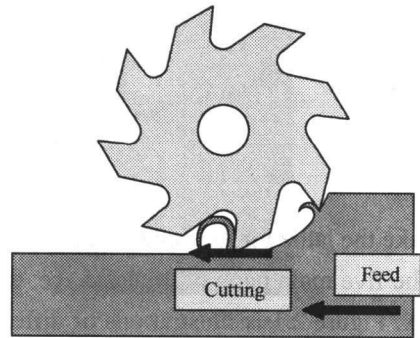
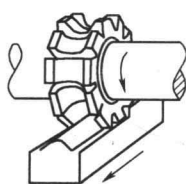


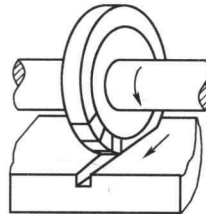
Figure 1.13 Down Milling



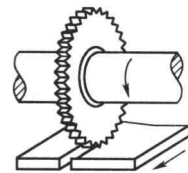
(a) Straddle Milling



(b) Forming Milling



(c) Slotting



(d) Slitting

Figure 1.14 Other Milling Operations



Practice

Match the following English words with correct Chinese.

- | | | | |
|-------|----------------------|--------|-------------|
| 1. 车床 | a. lathe | 6. 车削 | f. drilling |
| 2. 铣床 | b. planer machining | 7. 铣削 | g. planing |
| 3. 磨床 | c. grinding machine | 8. 磨削 | h. turning |
| 4. 钻床 | d. drilling machine | 9. 钻削 | i. milling |
| 5. 刨床 | e. milling machining | 10. 刨削 | j. grinding |



Role Play

Work in pairs. One acts as an experienced worker, the other as a new worker. Please tell the newcomer about the names of different parts of a lathe and their functions.



每课一句

It is no use doing what you like; you have got to like what you do.
不能爱哪行才干哪行，要干哪行爱哪行。

—Winston Churchill
——温斯顿·丘吉尔

Lesson 2

Machine Tool Device

Take the lathe for example. Let's learn something about machine tool device.

The five main parts of the lathe are: the bed, the headstock, the carriage, the tailstock, and the gearbox. Figure 2.1 is illustrations of different lathes and lathe parts. Study these parts concerning their names and locations.

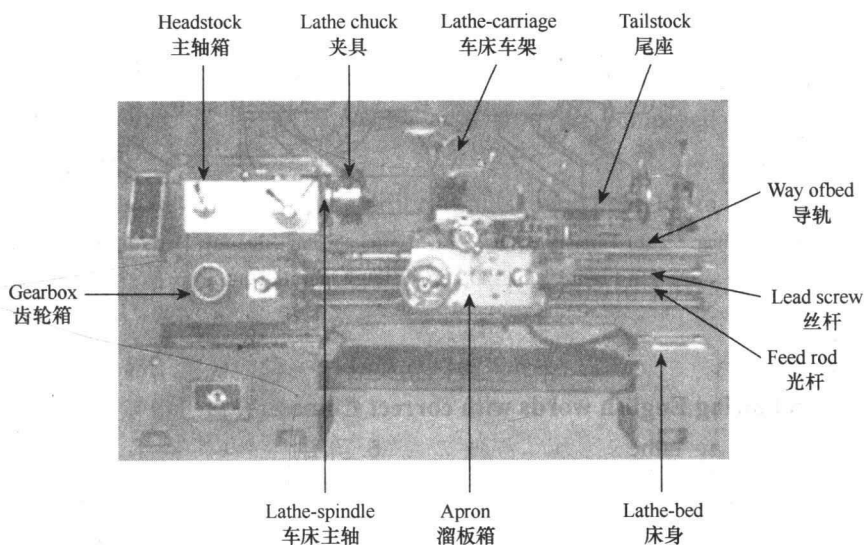


Figure 2.1 The Lathe Devices

The headstock houses the spindle and the components which drive the spindle and the feed gears. Shown in figure 2.2. The headstock can realize the main movement of the machine, and change the speed of the machine tool. The spindle holds and drives the workpiece.

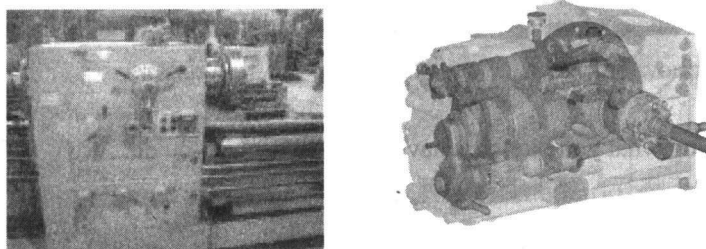


Figure 2.2 Headstock