

| 高等职业院校“十三五”课程改革优秀成果规划教材 |

# 机电专业英语

● 主 编 王鹏飞

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高等职业院校“十三五”课程改革优秀成果规划教材

# 机电专业英语

主 编：王鹏飞

副主编：王恩海

参 编：刘卓雷 吕晓倩 吴 娟 王延波  
马岩美 张维录

## 内 容 简 介

本书具有内容新颖、丰富和实用性强的特点,旨在帮助高职高专院校装备制造类专业学生及一线工程技术人员,提高专业英语应用能力。

全书共包含 25 个单元,内容包括金属材料及热处理、液压传动在机械上的应用、锻压技术、焊接技术、车床、铣床、钻床、磨床、组合机床、机械零件设计、齿轮、轴承、凸轮、联轴节、皮带传动、金属切削原理与刀具、公差与配合、工具与夹具、质量控制技术、计算机辅助设计与制造系统、数控原理与加工、伺服控制系统、数控加工中心、零件的数控加工编程、数控机床的安全与维护、自适应控制、柔性制造系统、未来工厂、计算机集成制造系统、工业机器人等。每单元皆由课文和阅读材料组成,每篇课文后皆附有汉语翻译、生词和短语、注释,阅读课文附有专业词汇和短语,方便读者学习。

本书可作为高职高专院校装备制造类专业“机电专业英语”课程的教材,也可作为成人教育及职工培训教学的参考书和相关专业工程技术人员的自学用书。

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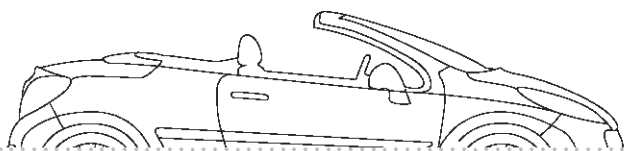
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# 前 言

P R E F A C E

当前，在中国从制造业大国向制造业强国迈进的进程中，专业英语的应用能力已成为高等院校学生和科技工作者必须具备的素质之一。本书编写的主要目的是帮助高职高专院校装备制造类专业的学生们提高专业英语的实际应用能力。

本书结合当前高职高专教学改革形势以及编者多年的教学经验，依照高职高专的培养目标及企业的实际情况，突出“实用、可用、好用”的原则，在内容编排上突出“贴近企业，贴近实际，贴近岗位”的要求，并力求通俗、易懂、好学、用得上。

本书共包含 25 个单元，内容包括金属材料及热处理、液压传动在机械上的应用、锻压技术、焊接技术、车床、铣床、钻床、磨床、组合机床、机械零件设计、齿轮、轴承、凸轮、联轴节、皮带传动、金属切削原理与刀具、公差与配合、工具与夹具、质量控制技术、计算机辅助设计与制造系统、数控原理与加工、伺服控制系统、数控加工中心、零件的数控加工编程、数控机床的安全与维护、自适应控制、柔性制造系统、未来工厂、计算机集成制造系统、工业机器人等方面的英文材料。每单元皆由课文和阅读材料组成，每篇课文后皆附有汉语翻译、生词和短语、注释，阅读课文附有专业词汇和短语，方便读者学习。

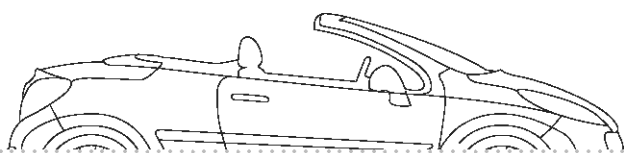
本书可作为高职高专院校装备制造类专业“机电专业英语”课程的教材，也可作为成人教育及职工培训教学的参考书和相关专业工程技术人员的自学用书。

本书由山东工业职业学院王鹏飞老师任主编，王恩海老师任副主编，参加编写的还有山东工业职业学院刘卓雷、吕晓倩、吴娟、马岩美、王延波和枣庄职业学院张维录老师。具体编写分工为：王鹏飞编写 Unit 1 ~ Unit 4，王恩海编写 Unit 5 ~ Unit 8，刘卓雷编写 Unit 9 ~ Unit 12，吕晓倩编写 Unit 13 ~ Unit 16，马岩美、张维录编写 Unit 17 ~ Unit 20，王延波编写 Unit 21 ~ Unit 22，吴娟编写 Unit 23 ~ Unit 25。全书由王鹏飞负责统稿，李士军教授审阅了全书。

本书在编写过程中参考和引用了大量资料和文献，在此向所引用资料和文献的作者表示衷心感谢。

由于编者水平所限，书中疏漏之处在所难免，恳请读者批评指正。

编 者



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# Unit 1

## Primary Motion and Feed Motion



### TEXT

#### Primary Motion and Feed Motion

Broadly speaking, two kinds of relative motions must be provided by a machine tool—the primary motion and the feed motion (Fig.1-1). Combination of these two motions will lead to a chip removal and the creation of machined surface with desired geometry. As a rule, the primary motion absorbs most of the total power which is required to perform a machining operation. The feed motion may proceed by steps or continuously and absorbs a small proportion of the total power.

Turning means machining a piece of rotating metal by pressing a hardened cutting tool against it. The work is given the primary motion while the tool is fed continuously. The process of planning and shaping is removing metal in a series of straight cuts. In planning, the work is given a linear motion while the tool remains motionless during the cutting stroke and is provided with a lateral feeding movement during the return stroke. In the case of the shaper, the kinematic relationship between work and tool is reversed; however, the cutting action principle is the same.

Drilling consists of rotating the drill and advancing the tool along its axis to rotate a round hole. Of the two functions, advancing the tool along its axis is the major consideration in the design of drilling machines. By comparison, rotating the drill is a simple matter.

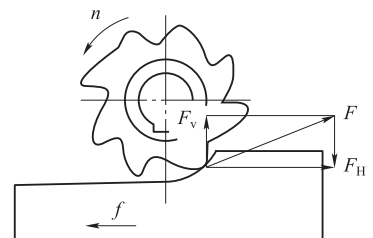


Fig.1-1 Primary motion and feed motion

### ★ Translation

#### 主运动与进给运动

概括地讲，机床必须提供两种相对运动——主运动与进给运动（图 1-1）。通过这两种运动的结合就可进行切削加工，把工件表面加工成所要求的几何形状。通常，主运动要消耗切削加工所需要的总功率中的大部分；进给运动可以间断进行或连续运行，只消耗总功率中

的一小部分。

车削就是用硬质合金车刀切削装夹旋转的金属工件的运动。车削时，工件做主运动，而刀具则做连续进给运动。刨削就是通过一连串的直线切削来切除金属。在龙门刨床上，工件做直线运动，刀具在切削行程中静止不动，而在工件返回行程中做横向进给。在牛头刨床上，刀具与工件之间的运动关系与龙门刨床相反；然而，两者的切削动作原理是相同的。钻削包括使钻头旋转和使之沿自身的轴线向固定不动的工件进给，以加工出一个圆孔。在这两种功用中，使钻头沿自身的轴线进给是设计钻床时主要考虑的问题，相比之下旋转钻头就显得简单了。

## ★ New Words and Expressions

primary	['praɪməri]	adj. 第一位的
broad	[brɔ:d]	adj. 宽的
broadly	['brɔ:dli]	adv. 概括地，大致地
removal	[ri'mu:vəl]	n. 移动，切除
geometry	[dʒi'ɒmətri]	n. 几何形状，几何学
absorb	[əb'sɔ:b]	vt. 吸收，吸引
proceed	[prə'si:d]	vi. 进行，发生
continuous	[kən'tɪnjuəs]	adj. 连续的，持续的
continuously	[kən'tɪnjuəsli]	adv. 连续不断地
proportion	[prə'pɔ:ʃn]	n. 比例，部分
linear	['liːniə(r)]	adj. 直线的，线性的
motionless	['məʊnləs]	adj. 不动的，静止的
lateral	['lætərəl]	adj. 横(向)的
return	[ri'tɜ:n]	v.&n. 返回，退回
kinematic	[,kɪnɪ'mæti:k]	adj. 运动学(上)的
relationship	[ri'leiʃnʃɪp]	n. 关系
reverse	[ri'veɜ:s]	v.&n. 相反，背面
		adj. 相反的
reversely	[ri'veɜ:slɪ]	adv. 相反地
principle	['prɪnsəpl]	n. 原则，原理
advance	[əd'vɑ:ns]	v. 前进，推进
axis	['æksɪs]	n. 轴

axes	['æksɪ:z]	n. 轴（复数）
round	[raʊnd]	adj. 圆的
		prep. 围着
		adv. 围绕着
consideration	[kən,sɪdə'reɪʃn]	n. 考虑
comparison	[kəm'pærɪsn]	n. 比较
matter	['mætə(r)]	n. 事件，物质
mechanical	[mə'kæni:kəl]	adj. 机械的
manufacturing	[ˌmænju'fæktʃərɪŋ]	n. 制造业
vacancy	['veɪkənsɪ]	n. 空缺

primary motion	主运动
broadly speaking	概括地讲
lead to	导致
as a rule	通常，照例
by steps	逐步地
a small proportion of	小部分
linear motion	线性运动
lateral feeding movement	横向进给运动
return stroke	返回行程
take...into consideration	对……加以考虑，考虑到
by comparison	比较起来

## ★ Notes

1. Broadly speaking, two kinds of relative motions must be provided by a machine tool—the primary motion and the feed motion.

概括地讲，机床必须提供两种相对运动——主运动与进给运动。

• “Broadly speaking” 是插入语，这里还可译为“一般讲”。破折号后面的内容“the primary motion and the feed motion” 实际上是解释“two kinds of relative motions”，不要因为破折号在“a machine tool” 后面，就误以为“the primary motion and the feed motion” 是解释“a machine tool” 的。在英语中，很多场合使用被动语态，宾语放在了前面，而主语放在了后面，造成了中心词与解释中心词的内容从形式上看被分开了，因而在翻译时要特别引起注意。

2. As a rule, the primary motion absorbs most of the total power which is required to perform a machining operation.

通常，主运动要消耗切削加工所需要的总功率中的大部分。

● “As a rule” 作为一个整体，其含义为“通常”。“which” 引导的是定语从句，用来进一步解释“total power” 是用来干什么的。

3. The work is given the primary motion while the tool is fed continuously.

工件做主运动，而刀具则做连续进给运动。

● “be given” (被给) 常可译成“得到”“获得”。例如；

I am given a book.

我得到一本书。

In turning, the work is given the primary motion.

车削时，工件做主运动。

4. Of the two functions, advancing the tool along its axis is the major consideration in the design of drilling machines.

在这两种功用中，使钻头沿自身的轴线进给是设计钻床时主要考虑的问题。

● “Of” 放在句首表示“在……中”，例如：

Of all machine tools, the lathe is the most common one.

在所有的机床中，车床是最普通的一种。

Of all metals, steel is the most widely used in engineering.

在所有金属中，钢在工程上用得最普遍。

● 有时把句子从英文翻译成中文时要根据上下文的意思进行适当的加词，以使句子读起来通俗易懂。本句在翻译时，可在两种功用前面加上一个定语“加工出一个圆孔”。虽然句中并没有对应的英文，但从上一句讨论的钻削中，我们就可以知道是在讲加工一个孔。



## READING MATERIAL

### Power in the Workshop

The processes of cutting metal generally require some power so that the application of power in the workshop processes is important. Energy is required in various forms by machine tools, for example, reciprocating motion to a planer table, longitudinal feed to a lathe carriage, rotational motion to a drill, etc., but it is nearly always supplied to the machine in the form of rotational energy of the pulley. One of the functions of the machine is to convert the rotational energy into the required form. Energy is supplied to most of our workshops in the form of electricity, and it is converted to rotational energy by means of the electric motor.

Early machine tools were driven by a reciprocating steam engine through a system of pulleys, belts, and clutches. Usually, a single steam engine provided the power for several machine tools in the workshop. Later, a single electric motor replaced the steam engine to drive a group of machine tools. In modern workshops, most of the machine tools are provided with individual motor

drive. Each machine has its own electric motor which drives through belt, gearing, or by direct coupling.

## ★ Translation

### 车间动力

由于金属切削过程一般需要某种动力，因此，把动力用到车间加工中这个问题是十分重要的。机床需要不同形式的动力，例如，龙门刨床工作台要做往复运动、车床的拖板做纵向进给运动、钻头做旋转运动等。但是，能量几乎都是以皮带轮转动能的形式提供给机床的。机床的功能之一是把转动能变为所需要的形式。供给我们大多数车间的能是电能，它通过电动机转变为转动能。

早期的机床是往复式蒸汽机通过一组皮带轮、皮带及离合器来驱动的。通常在车间里，一台蒸汽机为几台机床提供动力。后来，用一台电动机取代蒸汽机来驱动一组机床。在现代车间中，大多数机床都是由各自独用的电动机驱动。每一台机床都有自己的电动机，并通过皮带、齿轮传动装置或直接通过联轴器来驱动机床。

## ★ Professional Words and Phrases

workshop	['wɜ:kʃɒp]	n. 车间, 工场
application	[,æplɪ'keɪʃn]	n. 使用, 应用
energy	['enədʒi]	n. 能力, [物]能量
rotational	[rəʊ'teɪʃənl]	adj. 螺旋的, 循环的
near	[nɪə(r)]	adj.&adv.&prep. 接近
nearly	['nɪəli]	将近, 大约, 几乎
always	['ɔ:lweɪz]	adv. 总是, 始终
supply	[sə'plai]	n. 提供, 电源
		vt. 提供, 供应
convert	[kən'veɜ:t]	vt. 使转变
electricity	[ɪ,lek'trɪsəti]	n. 电, 电学
steam	[sti:m]	n. 蒸汽
system	['sɪstəm]	n. 系统, 体系, 制度
place	[pleɪs]	n. 地点, 位置
		vt. 放置