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全国职业技能英语系列教材

总主编 丁国声

*English for
Mechanical and
Electrical Engineering*

机电英语

李玉萍 主编



北京大学出版社
PEKING UNIVERSITY PRESS

职场英语

贴近工作岗位，突出岗位情景

开放性、国际性、任务性、职业性、实用性、仿真性……

English for Vocational Purposes 全国职业技能英语系列教材

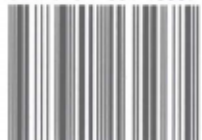
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《机电英语》内容包括机械零件、金属成型过程、模具、工程材料、机床、计算机辅助设计、制造、计算机辅助工艺编制、计算机集成制造系统、集成电路、电火花加工、电动机、工业机器人和机电一体化。题材均选自原版英语教材和资料，新颖、实用。本书在设计和编写上遵守高职高专教育的应用性特征，每个单元从课文到练习的设计上由浅入深，既突出基础知识也强调实际应用，既突出专业特色又能充分体现英语教学的规律，达到语言技能与职业知识技能的整合。全书图文并茂，集职业性、实用性、适时性和趣味性为一体。

本教材适合高职高专机电专业的学生使用，也可供电大、各类成人院校及相关专业的工程技术人员学习与参考，或作为中等职业学校机电类专业用教材。

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总序

我国高职高专教育的春天来到了。随着国家对高职高专教育重视程度的加深,职业技能教材体系的建设成为了当务之急。高职高专过去沿用和压缩大学本科教材的时代一去不复返了。

语言学家 Harmer 指出:“如果我们希望学生学到的语言是在真实生活中能够使用的语言,那么在教材编写中接受技能和产出技能的培养也应该像在生活中那样有机地结合在一起。”

课改的关键在教师,教师的关键在教材,教材的关键在理念。我们依据《高职高专教育英语课程教学基本要求》的精神和编者做了大量调查,秉承“实用为主,够用为度,学以致用,融类旁通”的原则,历经两年艰辛,为高职高专学生编写了这套专业技能课和实训课的英语教材。

本套教材的内容贴近工作岗位,突出岗位情景英语,是一套职场英语教材,具有很强的实用性、仿真性、职业性,其特色体现在以下几个方面:

1. 开放性

本套教材在坚持编写理念、原则及体例的前提下,不断增加新的行业或岗位技能英语分册作为教材的延续。

2. 国际性

本套教材以国内自编为主,以国外引进为辅,取长补短,浑然一体。目前已从德国引进了某些行业的技能英语教材,还将从德国或他国引进优秀教材经过本土化后奉献给广大师生。

3. 职业性

本套教材是由高职院校教师与行业专家针对具体工作岗位、情景过程共同设计编写。同时注重与行业资格证书相结合。

4. 任务性

基于完成某岗位工作任务而需要的英语知识和技能是本套教材的由来与初衷。因此,各分册均以任务型练习为主。

5. 实用性

本教材注重基础词汇的复习和专业词汇的补充。适合于在校最后一学期的英语教学,着重培养和训练学生初步具有与其日后职业生涯所必需的英语交际能力。

本教材在编写过程中,参考和引用了国内外作者的相关资料,得到了北京大学外语编辑部的倾力奉献,在此,一并向他们表示敬意和感谢。由于本套教材是一种创新和尝试,书中瑕疵必定不少,敬请指正。

丁国声

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2008年6月

编写说明

本书是按照高职高专机电专业教学大纲,为完成高职高专教育英语课程教学基本要求的学生编写的专业英语教材。本教材在编写中遵照高等技术教育的应用性特征,注重培养学生实际运用语言的能力,突出教学内容的实用性和针对性。

本教材共9个单元,选材涉及机械(机械零件,锻造、冲压和轧制,模具,机床、工程材料),计算机数控(计算机辅助设计、制造,计算机辅助工艺设计,计算机集成制造系统),电子与信息技术(集成电路)和应用技术(电火花加工,电动机,工业机器人,机电一体化)。每个单元由导入部分、课文阅读和课后阅读三部分组成,内容由浅入深,从基础知识到实际应用,语言规范,难度适中。既突出专业特色,又能充分体现英语教学的规律。

本教材在编写中注意以学生为中心,注重语言技能与职业知识技能的结合,强调职业仿真环境下工作语言情景的导入,图文并茂,力求增强教学的直观性,降低学习难度,增强趣味性和知识性。通过最新应用实例,体现教学内容的实时性,使学生在了解岗位主要流程、工作内容、工作职责、相关知识、文化背景和职业操守的同时,达到能运用英语自如应对涉外工作的目的。

本书在编写过程中得到了编者所在学校领导的支持,在此表示衷心的感谢。由于时间和水平有限,书中难免有缺陷与不足之处,欢迎广大读者不吝指正。

编者

2008.4



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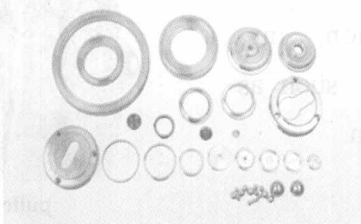


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Unit 1

Machine Elements

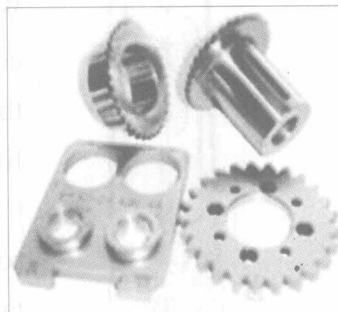
机械零件



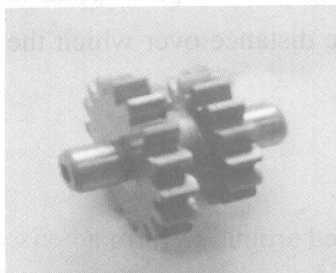
Introduction

The function of a mechanism is to transmit or transform from one rigid body to another as part of the action of a machine. There are three types of common mechanical devices that can be used as basic elements of a mechanism.

1. Gear system, in which toothed members in contact transmit motion between rotating shafts.
2. Cam system, where a uniform motion of an input member is converted into a nonuniform motion of the output member.
3. Plane and spatial linkages are also useful in creating mechanical motions for a point or rigid body.



machine elements



gear

Gear

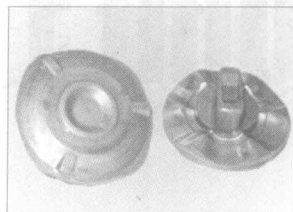
Gears are toothed wheels meshed together to transmit motion and force. In any pair of gears the larger one will rotate more slowly than the smaller one, but will rotate with greater force. Each gear in a series reverses the direction



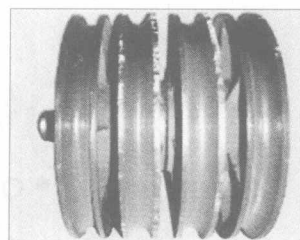
of rotation of the previous gear.

Cam

A cam is a machine element having a curved outline or a curved groove, which, by its oscillation or rotation motion, gives a predetermined specified motion to another element called the follower. Cam mechanism is conveniently used to transform one of the simple motions, such as rotation, into any other motions, such as translation, oscillation.



cam



pulley

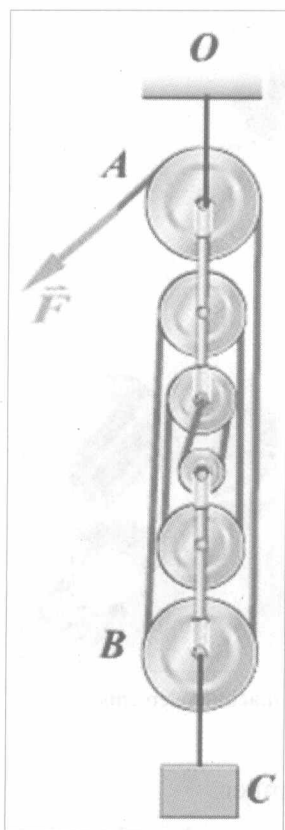
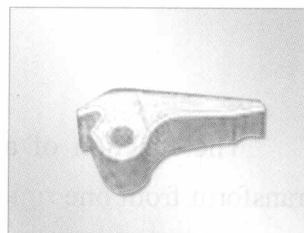


Fig. 1-1

Pulley

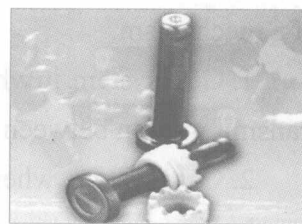
A single pulley simply reverses the direction of a force. When two or more pulleys are connected together (Fig. 1-1), they permit a heavy load to be lifted with less force. The trade-off is that the end of the rope must move a greater distance than the load.



lever

Lever

A lever is a stiff rod that rotates around a pivot point. Downward motion at one end results in upward motion at the other end. Depending on where the pivot point is located, a lever can multiply either the force applied or the distance over which the force is applied.



screw

Screw

A screw is a central core with a thread or groove wrapped around to form a helix. While turning, a screw converts a rotary motion into a forward or backward motion.

1. The following are the elements of a machine. Do you know the meaning of them? Can you add any?

nut	spring	gear
cam	shaft	bearing
coupling	clutch	lever
hub	pulley	supporting structure
rivet	crankshaft	connecting rod
bolt	screw	fastener

The Elements of a Machine

Vocabulary Assistant

transmit 传输, 转送

gear 齿轮

rotating shaft 转轴

uniform motion 均匀(等速)运动

plane 平面的

mesh 啮合

groove 槽纹, 刻槽

predetermine 事先安排

translation 移动, 变换

heavy load 负重载

lever 杆, 杠杆

screw 螺丝钉

nut 螺母, 螺丝钉

bearing 轴承, 支撑

clutch 离合器, 联轴器

supporting structure 支撑结构

rigid 刚性的

shaft 轴

cam 凸轮

convert 使转变, 使……改变

spatial linkage 空间联结

reverse 颠倒, 转动

oscillation 摆动, 振动

follower 从动轮

pulley 滑轮, 滑车

trade-off 平衡, 交换, 协定

pivot point 支点

helix 螺旋, 螺旋状物

spring 弹簧, 发条

coupling 连接器, 联合器

hub 轮毂

rivet 铆钉; 铆接, 固定



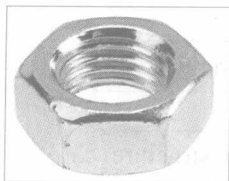
crankshaft 曲轴, (机)机轴

connecting rod 连杆, 活塞杆

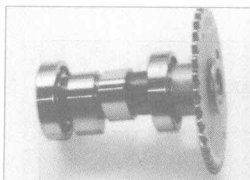
bolt 螺钉, 螺栓; 插销; 锁簧

fastener 紧固件, 扣件

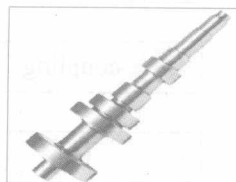
2. Look at the following pictures. Do you know what they are? Then discuss the function of each with a partner.



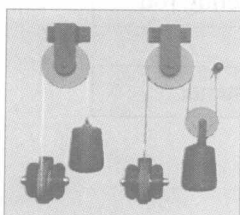
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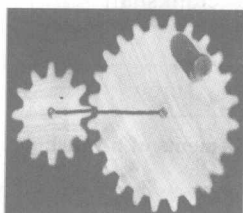
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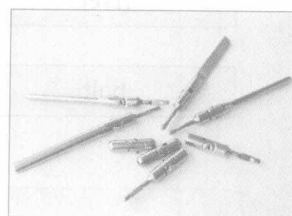
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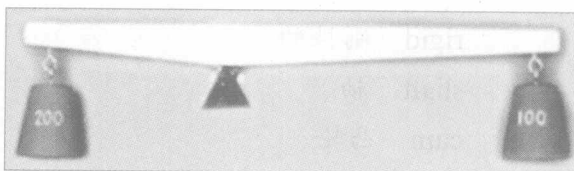
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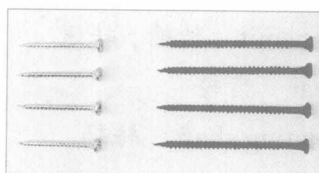
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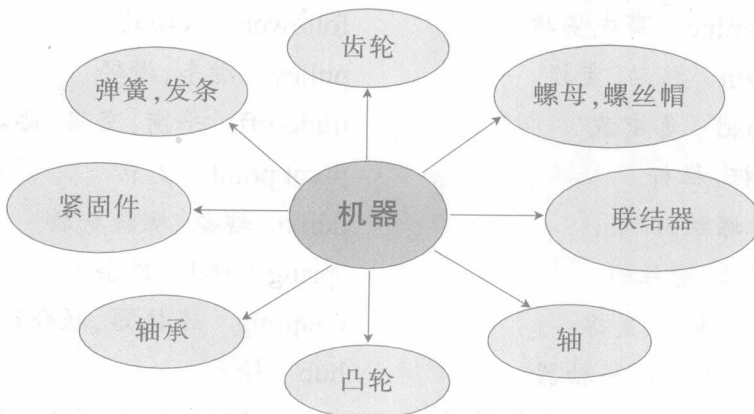


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H

3. Look at the following elements of a machine. Can you give English version to each of them?

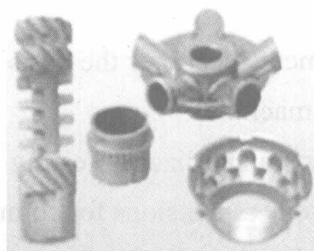


The Elements of a Machine

4. Match the definitions with the terms.

A. gear	B. bearing	C. cam	D. shaft
---------	------------	--------	----------

- _____ 1) This device can transmit exact motions at specific time in cycle. It has a curved grooved surface which mates with follower and imparts motion to it.
- _____ 2) This device is wheel with teeth that engages or meshes with each other so that they work in pairs to transmit or change motion.
- _____ 3) This device is mounted in bearings and transmits power through such devices as gears, pulleys, cams, and clutches.
- _____ 4) This element is a support system for rotating, oscillating, or translating machine elements, in which friction has been greatly reduced.

Passage Reading
Machine Elements**机械零件**

- 1** However simple, any machine is a combination of individual components generally referred to as machine elements or parts. Thus, if a machine is completely dismantled, a collection of simple parts remains such as nuts, bolts, springs, gears, cams and shafts—the building block of all machinery. A machine element is, therefore, a single unit designed to perform a specific function and capable of combining with other elements. Sometimes certain elements are associated in pairs, such as nuts and bolts or keys and shafts. In other instances,



a group of elements is combined to form a subassembly, such as bearings, couplings, and clutches.

Questions: *What is machine?*

Can you list some machine elements?

2 The most common example of machine elements is gear, which is a combination of wheel and lever to form a toothed wheel. The rotation of this gear on a hub or shaft drives other gears that may rotate faster or slower, depending upon the number of teeth on the basic wheels.

3 Other fundamental machine elements include wheel and lever. A wheel must have a shaft on which it may rotate. The wheel is fastened to the shafts with couplings, and the shaft must rest in bearings. The supporting structure may be assembled with bolts, rivets or by means of welding. Proper application of these machine elements depends upon knowledge of the force on the structure and the strength of the materials employed.

Questions: *What is gear?*

What can influence the proper application of machine elements?

4 The individual reliability of machine elements becomes the basis for estimating the overall life expectancy of a complete machine.

5 Many machine elements are thoroughly standardized. Testing and practical experience have established the most suitable dimensions for common structural and mechanical parts. Through standardization, uniformity of practice and resulting economics are obtained. Not all machine parts in use are standardized, however. In the automotive industry only fasteners, bearings, bushings, chains, and belts are standardized. Crankshafts and connecting rods are not standardized.

Questions: *How to estimate the overall life expectancy of a complete machine?*

What can we obtain through standardization?

Vocabulary Assistant

combination 结合, 联合

dismantle 拆除

combine (使)联合

rotate 旋转

assemble 装配

application 应用

overall 全部的, 全体的

standardize 使标准化

uniformity 同样, 一致

automotive industry 汽车工业

chain 链条, 电路

component 成分, 元件, 部件

capable 有可能的

subassembly 部件, 组件

fasten 结牢

weld 焊接

reliability 可靠性

life expectancy 平均寿命, 预期寿命

dimensions 大小, 体积

automotive 汽车的

bushing [机]轴衬; [电工]套管

1. Fill in the table below by giving the corresponding translation.

English	Chinese
automotive	
	联结器
uniform motion	
	支承结构
crankshaft	
	螺钉
rotate	
	离合器
uniformity	
	寿命

2. Find the definition in Column B which matches the words in Column A.

A

B

_____ 1) component

a. tear down

_____ 2) motion

b. a long thin implement made of metal or wood

_____ 3) dismantle

c. link connecting two parts