

全国中等职业技术学校 机械类专业教材
专业英语系列教材

机械英语

MECHANICAL ENGLISH



 中国劳动社会保障出版社

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前 言

随着我国社会主义市场经济的进一步发展,特别是入世以后,越来越多的企业对技术工人的专业外语水平提出了较高的要求,因此,专业英语已成为学生们参与就业竞争,以及今后从业后在工作中所必需的工具之一。为适应这一需要,我们组织编写了这套专业英语教材,并在编写过程中坚持了以下原则:

第一,与专业紧密结合,根据专业需要设置单元内容,力求收录各专业最新、最实用的词汇和用语,并注意在选材时降低相关专业知识的难度,使教材既突出专业特色,又能充分体现英语教学的规律。

第二,根据不同专业对英语教学的要求,教材在单元设置中阅读和口语各有侧重,如《饭店服务英语》《商品经营英语》《文秘英语》等侧重口语,而《电工英语》《电子英语》《机械英语》等则侧重阅读。对专业性较强的部分教材还给出了阅读部分的译文,以方便师生的教与学。

第三,教材在内容上注重选材新颖实用,力求采用地道的英语表达;在形式上注重生动活泼,图文并茂。

本套教材为中等职业技术学校学生设计,初中起点,并与通用教材《英语》相配套。考虑到通用英语教材中已讲授语法,故此套教材不再列入语法条目,涉及到语法难点时在“注释”中予以讲解。

本套教材自成体系,同时每种教材的编写又参照了相关专业的教学计划和主要专业课程的教学大纲,故又可与各相关专业配套使用。

本套教材首先于2003年推出《电子英语》《会计英语》《饭店服务英语》《烹饪实用英语》《文秘英语》《商品经营英语》《服装英语》等7种,2004年将推出《物业管理英语》《汽车维修英语》《机械英语》《电工英语》《机电英语》《计算机专业英语》《市场营销英语》等7种。以后,将根据专业需要继续推出《家政与社区服务英语》《美容美发英语》《物流英语》等,以满足各专业学生学习英语的需要。

此次教材的开发工作得到了北京、湖南、湖北、广东、江苏等省(市)劳动和社会保障厅(局)以及有关学校的大力支持,并得到了美国新闻学硕士 Mr. Michael Connelly 的大力帮助,对此我们表示诚挚的谢意。

劳动和社会保障部教材办公室

2004年4月

简介

本书根据劳动和社会保障部培训就业司颁发的《机械类专业教学计划》编写，供全国中等职业技术学校机械类专业使用。本书主要以阅读、对话的形式介绍了与机械类专业密切相关的内容，包括机械工业、机械热加工、机械冷加工、机械设计、CAD/CAM 和数控等先进机械加工技术。全书共 20 个单元，每单元内容包括阅读、对话、词汇、专业术语、注释、练习和课后阅读。本书内容丰富，通俗易懂；形式活泼，图文并茂。

本书也适合作为职业培训教材和职工自学用书。

本书由陈尧剑、赵育红、杨文广、曾斌编写，陈尧剑主编。

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Lesson One

Mechanical History in Ancient China

Reading

Mechanical engineering deals with the design and manufacture of tools and machines. It includes marine, automotive, aeronautical, heating and ventilating engineering, and others ^[1].

China is one of the earliest countries where machinery was developed in the world. There are many inventions and creations about machinery.

We also have our own characteristics in the design of mechanical structures and in the use of power. Our ancestors designed and applied a lot of special-purpose machineries, such as the Vehicle Pointing to the South, Seismograph and Incense Burner-in-quilt, etc (Fig. 1) ^[2]. They are all of special qualities.

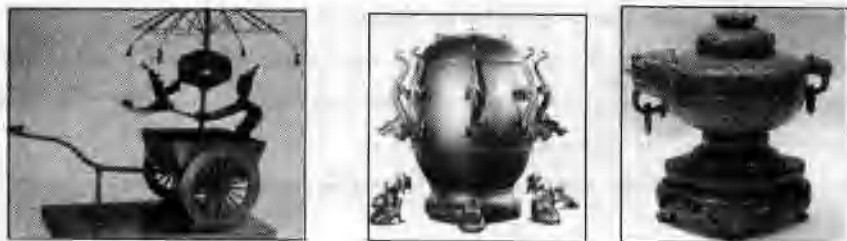


Fig. 1 Vehicle Pointing to the South, Seismograph and Incense Burner-in-quilt
(指南车) (地动仪) (被中香炉)

In the Spring and Autumn Period, the ironware and pig iron smelting and casting techniques appeared. There were also a pile of technologies in the Warring States Period, such as casting and anchor chain casting, etc ^[3].

Between 1634 and 1637, Song Yingxing of the Ming Dynasty wrote and published *Things Turned On by the Work of Nature* (Fig. 2). It records many contents about machine-building and product properties. This book is known as China's techniques encyclopedia in the 17th century ^[4].

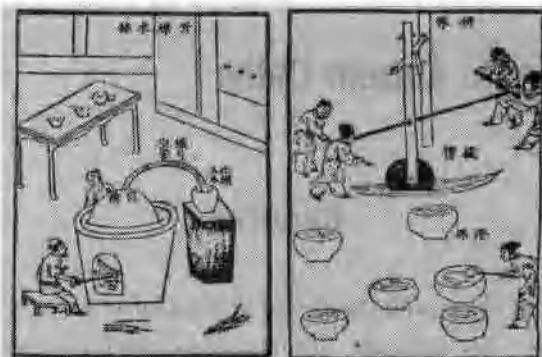


Fig. 2 The book of Song Yingxing (宋应星的书)

Dialogue

A: Tom, what is the original machine?

B: It may be the tools, which were used by the primitive men.

A: Right. The first tools that the mankind made were stone falchions, stone axes and stone hammers. All kinds of complicated and accurate modern machines are developed from the simple tools of the ancient times step by step^[5].

B: Oh, I see, sir. That is the reason why we learn the mechanical history.

Words

mechanical [miˈkænikəl] *adj.* 机械的, 力学的

ancient [ˈeɪnfənt] *adj.* 古老的, 古代的

engineering [endʒiˈniəriŋ] *n.* 工程, 工程学

deal [di:l] *n.* 买卖, 待遇 *v.* 处理, 应付

design [diˈzeɪn] *v.* 设计, 预定, 指定 *n.* 设计, 图案

manufacture [ˌmænjuːfæktʃə] *v.* 制造 *n.* 制造, 产品

include [inˈklu:d] *v.* 包括, 包含

marine [məˈri:n] *adj.* 海的, 海上的

automotive [ˌɔ:təˈməutiv] *adj.* 汽车的, 自动推进的

aeronautical [ˌæərəˈnɔ:tikəl] *adj.* 航空学的

ventilate [ˈventileɪt] *v.* 通风, 换气
machinery [məˈʃɪnəri] *n.* 机械
invention [ɪnˈvenʃən] *n.* 发明
creation [kriˈeɪʃən] *n.* 创造, 创作
characteristic [ˌkærɪktəˈrɪstɪk] *n.* [pl.] 特性 *adj.* 特有的, 典型的
structure [ˈstrʌktʃə] *n.* 结构, 构造, 建筑物
ancestor [ˈænsəstə] *n.* 祖先, 祖宗
apply [əˈplaɪ] *v.* 应用, 申请
purpose [ˈpəːpəs] *n.* 意图, 目的
vehicle [ˈviːɪkl] *n.* 运载工具, 车辆
point [pɔɪnt] *n.* 点 *v.* 指向
seismograph [ˈsaɪzməɡrɑːf] *n.* 地震仪, 测震仪
incense [ˈɪnsens; ɪnˈsens] *n.* 香, 熏香, 香气
burner [ˈbɜːnə] *n.* 灯头, 炉子, 火炉
quilt [kwɪlt] *n.* 被子
special [ˈspeʃəl] *adj.* 特别的, 特殊的
quality [ˈkwɒləti] *n.* 质量, 品质, 性质
ironware [ˈaɪənwɛə] *n.* 铁器, 金属器具
iron [ˈaɪən] *n.* 铁, 熨斗, 坚强, 熔铁
technique [tekˈniːk] *n.* 技术, 技巧, 方法, 表演法, 手法
appear [əˈpiə] *v.* 出现, 来到, 似乎
pile [paɪl] *n.* 堆, 摞, 叠
technology [tekˈnɒlədʒi] *n.* 科技, 工程技术, 工艺及应用科学
casting [ˈkɑːstɪŋ] *n.* 铸件, 铸造
anchor [ˈæŋkə] *n.* 锚 *v.* 抛锚, 停泊
chain [tʃeɪn] *n.* 链, 链条, 项圈
etc. = [拉丁语] et cetera (= and so on) 等等, 及其他
publish [ˈpʌblɪʃ] *v.* 出版, 发行
content [ˈkɒntent] *n.* 内容, 目录 *adj.* 满意的, 满足的
property [ˈprɒpəti] *n.* 财产, 性质, 特性
encyclopedia [ɪnˌsaɪkləˈpiːdiə] *n.* 百科全书
original [əˈrɪdʒənəl] *adj.* 最初的, 新颖的
primitive [ˈprɪmɪtɪv] *adj.* 原始的, 粗糙的
stone [stəʊn] *n.* 石头, 果核
falchion [ˈfɔːltʃən] *n.* (中世纪的) 略具弯形的大刀, [诗] 刀, 剑
axe [æks] *n.* 斧, (经费) 削减
hammer [ˈhæmə] *n.* 锤, 榔头 *v.* 锤击
complicated [ˈkɒmpleɪkɪtɪd] *adj.* 复杂的, 难解的

accurate [ˈækjʊrɪt] *adj.* 准确的, 正确无误的

Ancient China 古代中国

deal with 安排, 处理, 涉及, 做生意

the Spring and Autumn Period 春秋时期

the Warring States Period 战国时期

the Ming Dynasty 明朝

be known as 被称为, 被认为是

step by step 逐步地

Technical Terms

1. mechanical engineering 机械工程
2. the Vehicle Pointing to the South 指南车
3. Incense Burner-in-quilt 被中香炉
4. pig iron 生铁
5. anchor chain casting 锚链铸造
6. stone falchion 石刀
7. stone axe 石斧
8. stone hammer 石锤

Notes

1. 整句可以译为: “机械工程包括轮机工程、汽车工程、航空工程、暖气和通风工程等。”
2. 中国古代在机械方面有许多发明创造, 在动力的利用和机械结构的设计上都有自己的特色。许多专用机械的设计和应用, 如指南车、地动仪和被中香炉等, 均有独到之处。
3. 春秋至魏汉时期是中国古代机械开始较快发展的时期。该段可译为: “春秋时期铁器和生铁冶铸技术开始出现, 战国时期又有了叠铸和锚链铸造等工艺。”
4. 1634—1637 年, 明朝的宋应星编著和出版了《天工开物》, 该书记载了许多有关机械制造和产品性能的内容。该书因此被称为中国 17 世纪的工艺百科全书。
5. 机械始于工具, 工具是最简单的机械。人类最初制造的工具是石刀、石斧和石锤。现代各种复杂精密的机械, 都是从古代简单的工具逐步发展而来的。

Practice

1. Choose the correct answer from the four options.

- (1) China is one of the earliest countries _____ machinery was developed in the world. ()
A. where B. what country C. wherever D. at which
- (2) In the Spring and Autumn Period, the ironware and pig iron smelting and casting techniques _____. ()
A. developing B. appeared C. advanced D. increased
- (3) That is the reason _____ we learn the mechanical history. ()
A. for which B. because of C. whatever D. why

2. Complete the following sentences.

- (1) Our _____ designed and applied a _____ of special-purpose machineries, _____ as the Vehicle Pointing to the South, _____ and Incense Burner-in-quilt, etc.
- (2) There _____ also a _____ of technologies in the Warring States _____, such as casting and anchor chain casting, etc.

3. Translate the following sentences into Chinese.

- (1) We also have our own characteristics in the design of mechanical structures and in the use of power.
- (2) All kinds of complicated and accurate modern machines are developed from the simple tools of the ancient times step by step.

4. Translate the following expressions into English.

- (1) 许多关于机械的发明创造 (2) 机械结构的设计
(3) 铁器和生铁的熔炼和浇铸技术 (4) 中国工艺技术的百科全书

Reading more

Three areas engineers are engaged in (需要工程师的三个领域)

Transport (交通): Cars, trains, ships and planes are all products of mechanical engineering. Mechanical engineers are also involved in (包含于) support services (服务支持), such

as roads, rail tracks (铁轨), and bridges.

Food processing: Mechanical engineers design, develop, and make the machines and the processing equipment (设备) for harvesting (收割), preparing and preserving (储存) foods and drinks in supermarkets (超级市场).

Building services (建筑服务): Electrical (电气) engineers provide (提供) all the services we need in our homes and at working places, including lighting (照明), heating, ventilating, and air-conditioning, etc.

Lesson Two

Design Processes and Manufacture Flows

Reading

What does design mean^[1]?

In the design process, the needs of customers or the marketplace are transformed into a product^[2]. As a result, the product can satisfy these needs. A designer usually carries out this process, but the others in the company are also important. Fig. 1 shows a model of design.

Design is essentially an exercise of problem solving. Typically, the design of a new product consists of several stages, which are described in Fig. 2.

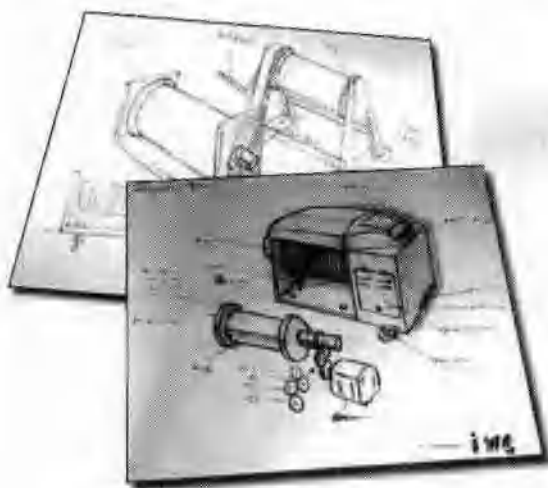


Fig. 1 A model of design
(设计实例)

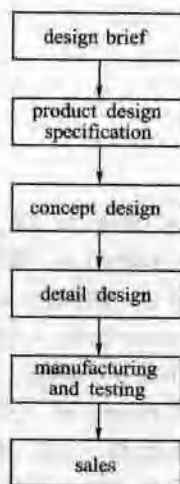


Fig. 2 A traditional design process^[3]
(传统的设计流程)

A designer might have to consider the following factors in a design process:

- Manufacture: Can the product be made in our facilities?
- Sales: Are we producing a product that customers want?
- Purchasing: Are these parts necessary? Why do we have to order them?
- Cost: Is the design going to cost too much to make?
- Transport: Is the product of the right size for transportation?

- Disposal: How will the product be disposed at the end of its life^[4]?

Pay attention to the topic of this lesson, design processes are in fact the guides of manufacture flows. This is the internal relationship between them.

Dialogue

A: Tom, you said that you like to be a machinist, didn't you?

B: Yes, sir. An outstanding machinist^[5]!

A: Then, do you know what you have to learn?

B: Sorry, sir. I'm not clear about it enough.

A: Both of manufacture and design. This lesson will introduce something about the design. So you can learn more about manufacture in succession.

B: I will try my best, sir.

Words

flow [fləu] *v.* 流动 *n.* 流, 流程

customer [ˈkʌstəmə] *n.* 顾客, 主顾

marketplace [ˈmɑːkitpleis] *n.* 市场, 集市

transform [trænsˈfɔ:m] *v.* 改变, 转换

satisfy [ˈsætɪsfai] *v.* 满足, 使满意, 说服

company [ˈkʌmpəni] *n.* 公司, 陪伴

essentially [ɪˈsenʃəli] *adv.* 本质上, 根本上

solve [ˈsɒlv] *v.* 解决, 解答

typically [ˈtɪpɪkəli] *adv.* 代表性地, 作为特色地

several [ˈsevrəl] *adj. & pron.* 几个, 数个

stage [steɪdʒ] *n.* 舞台, 戏剧, 阶段

describe [dɪsˈkraɪb] *v.* 形容, 描写, 描绘

brief [brɪf] *n.* 摘要, 大纲

specification [spesɪfɪˈkeɪʃən] *n.* 说明书, 详述, 规格

traditional [trəˈdɪʃənəl] *adj.* 传统的, 惯例的

consider [kənˈsɪdə] *v.* 认为, 考虑, 关心

factor [ˈfæktə] *n.* 因素, 要素

facility [fə'siliti] *n.* [常 *pl.*] 设备, 设施, 便利, 容易

sale [seil] *n.* 卖, 销售

purchase [ˈpɜ:tʃəs] *n.* 买, 购买 *v.* 买

order [ˈɔ:də] *n.* 定货, 定货单

cost [kɒst] *n.* 价格, 代价, 成本

transport [trænsˈpɔ:t] *n.* 运输, 运输工具

disposal [disˈpəuzəl] *n.* 丢掉, 处理, 销毁

topic [ˈtɒpik] *n.* 话题, 主题

guide [gaɪd] *n.* 指南, 导游者 *v.* 给……导游

internal [inˈtə:nl] *adj.* 内部的, 国内的

relationship [riˈleɪʃənʃɪp] *n.* 关系, 联系

machinist [məˈʃɪ:nɪst] *n.* 机械师, 机械工

outstanding [aʊtˈstændɪŋ] *adj.* 突出的, 杰出的

as a result 结果

carry out 完成, 实现, 贯彻, 执行

consist of 由……组成

pay attention to 注意

in succession 接着, 接连地

try one's best 尽力

Technical Terms

1. design process 设计流程
2. manufacture flow 加工工艺流程
3. concept design 概念设计

Notes

1. 机械设计方法是一个综合的机械设计概念。在产品的机械设计中要贯穿电气驱动和控制、液压驱动、气动、化学等跨学科的技术基础, 需要大量的时间去将这些具有特殊意义的内容同机械基础理论结合起来, 从而设计出所需要的某一机械产品。
2. 这是对 design 的一个通俗解释。可译为: “通过设计这一过程, 用户或者市场的需求将会转换成产品。”

3. 图2给出的是某一常见产品的设计流程。从上到下依次为：设计主旨——产品设计说明书——概念设计——细节设计——加工与测试——销售。
4. 这是在设计过程中需要考虑的某一因素：“报废——产品使用年限到时应该如何处理？”
5. 现代英语中，许多句子得到了简化。例如，该句等于“I want to be an outstanding machinist!”，可直接翻译为：“我要成为一名优秀的机械师！”

Practice

1. Choose the correct answer from the four options.

- (1) Design is _____ an exercise of problem solving. ()
A. essentially B. normally C. whatever D. in fact
- (2) A designer needs not to consider _____ in a design process. ()
A. manufacture B. purchasing C. disposal D. salary
- (3) As a result, the product can _____ the needs of customers. ()
A. know B. reward C. satisfy D. improve
- (4) There are many _____ a designer has to consider in a design process. ()
A. thing B. factors C. problems D. disposal

2. Complete the following sentences, then translate them into Chinese.

- (1) A designer _____ carries _____ this process, but the others in the company are _____ important.
- (2) _____, the design of a new product _____ of several _____.

3. Answer the following three questions in your own words. Of course, you can refer to the text as you want.

- (1) How many steps does a traditional design process include?
- (2) What factors might a designer have to consider in a design process?
- (3) Explain the internal relationship between design and manufacture.

Reading more

The Manufacture Flows of the Flange (法兰的生产流程)

The manufacture flows of the flange are mainly: ①Raw Materials (原料) ——②Severance

(断料) ——③Cutting (剪切) ——④Forging (锻造) ——⑤Heat treatment (热处理)
——⑥Machining (机加工) ——⑦Drying and Lacquering (烘干上漆) ——⑧Encasement (装箱).

These processes are described in Fig. 3.

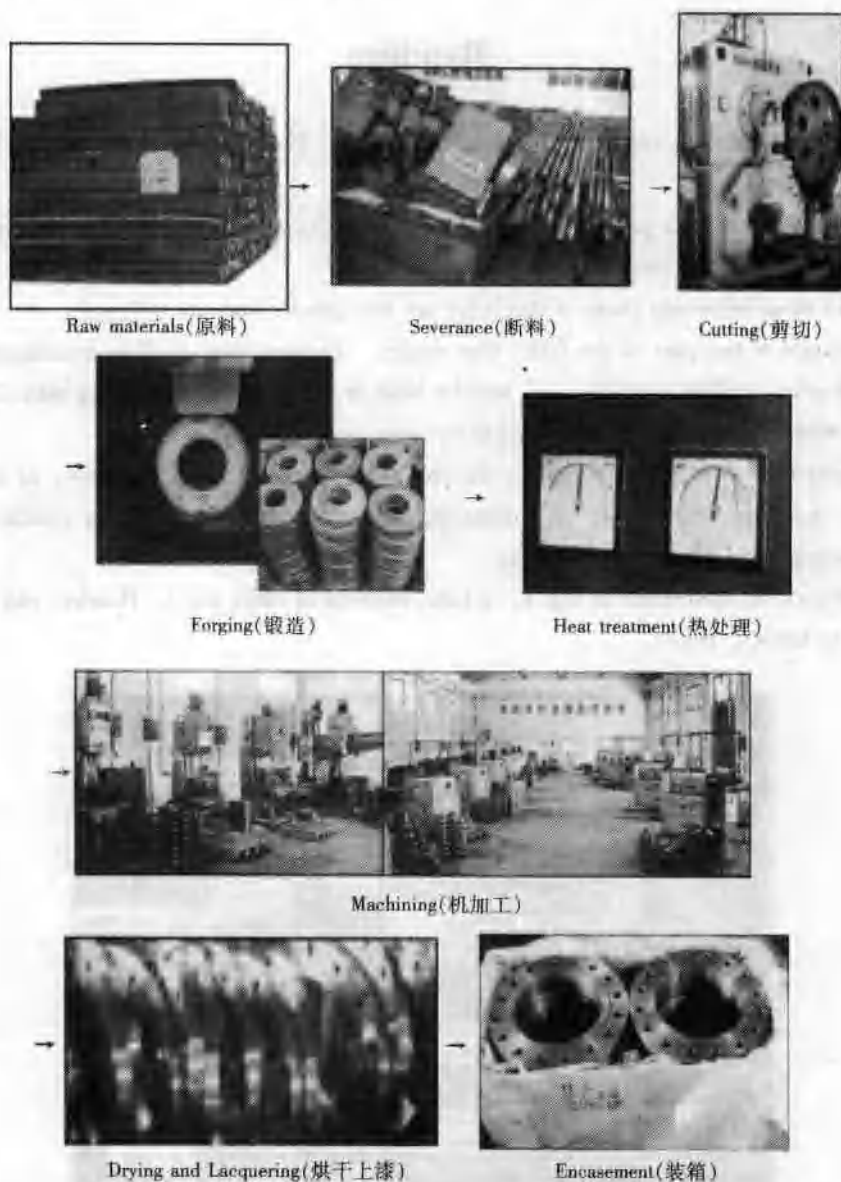


Fig. 3 The manufacture flows of the flange (法兰的生产流程)