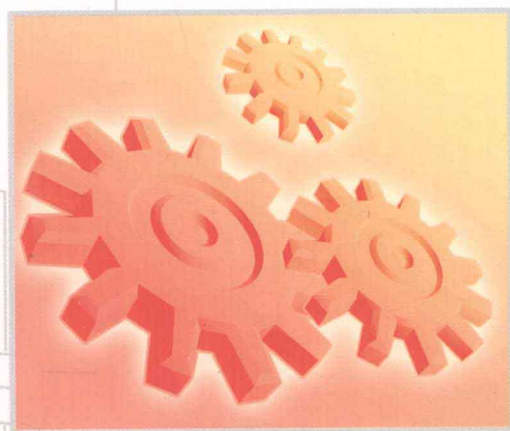
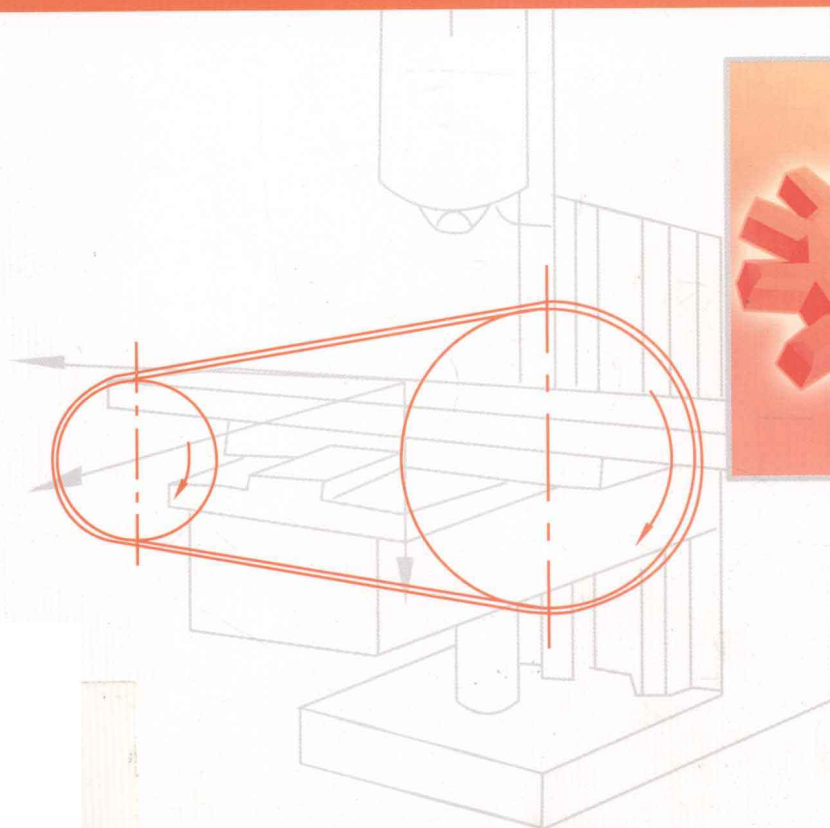


21 世纪高等院校规划教材

# 机电专业英语

## Electromechanical Specialized English

黄丽容 杜晓妮 王立芳 编著



国防工业出版社

National Defense Industry Press

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## 内 容 简 介

本书内容涉及机件图样的表达方法、常用的金属材料及冲压、塑压成形方法、机构和传动、常用机床及其机械加工方法、自动控制、计算机辅助设计及制造、科技英文的写作方法和求职简历。全书共分14个单元,前12个单元,每单元由课文、翻译技巧、阅读材料及与该课文主题相关的一些常用词汇四个模块组成。本书紧密贴合学生所学的专业基础课和专业课内容,为配合提高学生的自学能力,每篇课文都有生词表、注释和练习。本书强调专业性和实用性,实现了从书本知识到工作岗位,对专业英语实际应用的过渡。

本书可作为全国高等院校机电工程、机械制造及其自动化、机械工程及自动化、电气自动化、模具、数控等专业学生的教材,也可作为上述及相关专业工程技术人员的参考书。

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## 前 言

在高等教育全面改革的今天,学生的基本素质和实际工作能力的培养受到了空前的重视。对非英语专业的学生而言,英语水平的培养不仅是文化素质的重要部分,在很大程度上也是专业能力的补充和延伸。

《机电专业英语》旨在为机电专业提供一本比较系统的专业英语教学用书。该书包括机件图样的表达方法、常用的金属材料及冲压、塑压成形方法、机构和传动、常用机床及其机械加工方法、自动控制、计算机辅助设计及制造、科技英文的写作方法和求职简历。全书不仅涉及所学的专业基础课和专业课内容,还兼顾学生的科技英文写作能力和学生的就业问题。

本书共 14 个单元,其中 Unit 1、Unit 2、Unit 3、Unit 13、Unit 14 由黄丽容编写,Unit 6、Unit 7、Unit 8、Unit 9、Unit 10 由杜晓妮编写,Unit 4、Unit 5、Unit 11、Unit 12 由王立芳编写,全书由黄丽容负责统稿和定稿。在编写过程中,青岛职业技术学院海尔学院的老师提出了宝贵意见和建议,对他们的鼎力支持和热情帮助,在此表示真挚的谢意。

虽经多次补充和完善,但由于编者水平有限,书中难免有缺点和疏漏,恳请广大读者批评指正。

编 者



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## Unit 1

### Text

#### **Mechanical Drawing Expressions of Typical Parts**

[1] The article introduces engineering drawing concept and provides the knowledge and skills of interpreting and producing basic engineering drawings relevant to typical parts.

[2] Engineering drawings mean that the objects are expressed in drawings according to some projection method and technical requirements so that the shape, size, material and relative location of the project object are expressed exactly in the project technology<sup>①</sup>. Engineering drawings are classified as mechanical drawings, construction drawings, electronic drawings and chemical drawings. Mechanical drawings are widely used. Mechanical drawings are the channel for designers to express theoretical analysis, design concept, and requirements of the object. They are also the primary basis of manufacturing parts, inspecting parts, improving equipments, repairing equipments and product assembly. In addition they are the tool of exchanging information and technology, so they are called the language of engineering<sup>②</sup>. Common mechanical drawings are part patterns and assembly patterns. The part pattern can express the shape, size, technical requirements and others of the parts. The assembly pattern can express working principles, assembly relations, the shape of main parts, and the name and number of each part in the assembly.

[3] The part pattern consists of a title bar, a group of view, all sizes and technical requirements. The title bar includes the name, material, scale, and pattern code of the part, which can help us understand the use, processing method, and size of the part. A group of view can express part structure and shape exactly. All sizes can show size relation of each part of the body and their relative location. Technical requirements may be expressed in code, letter, and text which must be met in the manufacturing, inspection, and assembly.

[4] The typical parts are axle-sleeve parts, wheel-disk parts, board-cover parts, fork-rack parts, and box parts. The common axle-sleeve parts are axes, screws, sleeves ect. . They usually consist of many different diameter rotary bodies with the same axis.



Their main structural characteristics are that the axial size is longer than the radial size<sup>③</sup>. Their expressions are below;

The main view is expressed in a non-round view;

The other views consist of partial view, partial sectional view, sectional view, and partial zoom view;

The simple part with long axial size is drawn after it is disconnected and shortened;

The hollow axle-sleeve part can be drawn by use of full sectional view, partial sectional view, and partial view. A hollow axle-sleeve part is shown in figure 1 - 1.

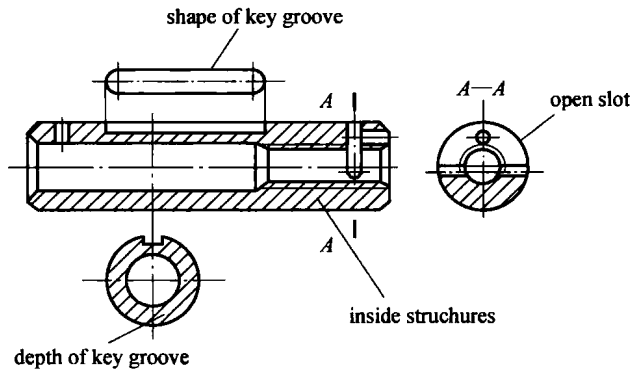


Figure 1 - 1 the expression of a hollow axle-sleeve part

[5] The common wheel-disk parts are gears, handwheels, belt wheels, flywheels, flanges, and covers. The body of them usually consists of many different diameter rotary bodies. Their structural characteristics are that the radial size is bigger than the axial. There are such structures as knife groove backs, convex parts, concave pits, chamfers, rounded corners, spokes, wheel teeth, ribs, screw holes, key grooves, and holes which have positioned and linked functions. Their expressions are below;

✧ The number and distribution of linking holes and ribs are expressed by left view or right view.

✧ A steering wheel part is shown in figure 1 - 2.

[6] The common board-cover parts are gasket plates, fixed boards, skateboards, connecting plates, workbenches, and covers of a box ect. . Their body has several prisms whose height is little. There are such structures as convex parts, concave pits, pin holes, screw holes, bolt holes, and molding holes. Such parts are formed by cutting after casting. Their expressions are below;

✧ The part is placed horizontally, and its bigger side is the projection direction of the main view.

✧ The structure distribution inside is expressed by the top view, or upward view.

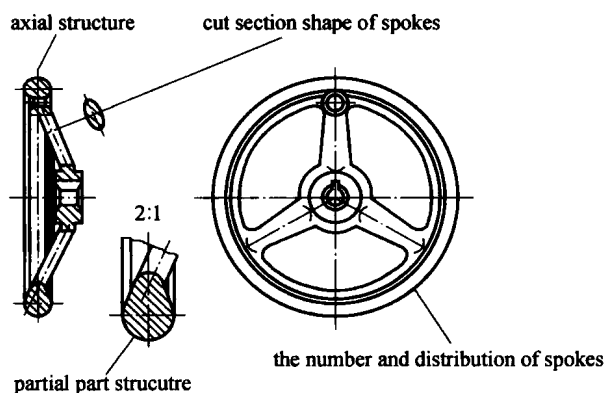


Figure 1-2 the expression of a steering wheel

✧ The other views consist of partial view, partial sectional view, sectional view, and partial zoom view. A board-cover part is shown in figure 1-3.

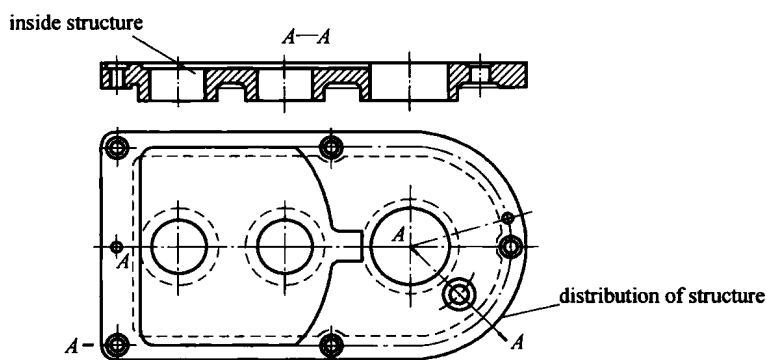


Figure 1-3 the expression of a board-cover part

[7] The box parts are the base section of the machine or parts, their major roles are below:

✧ They can support and contain all kinds of transmission parts, such as gears, axes and bearings. They can make them keep normal relations and the accuracy of movement. They can save lubricants to lubricant parts in the box.

✧ They can protect personal security, parts inside the box from the impact of environment, have little shock, and reduce the impact and noise.

### New Words and Phrases

1. part *n.* 零件
2. drawing *n.* 图样, 图纸
3. projection *n.* 投影
4. typical *adj.* 典型的, 特征的
5. technical *adj.* 技术的
6. requirement *n.* 要求, 规定

7. pattern *n.* 图样, 式样
8. axis *n.* 轴
9. screw *n.* 丝杆, 螺纹
10. sleeve *n.* 袖子, 套筒
11. axial *adj.* 轴向的
12. radial *adj.* 径向的
13. partial *adj.* 部分的, 局部的
14. view *n.* 视图
15. gear *n.* 齿轮
16. handwheel *n.* 手轮
17. beltwheel *n.* 皮带轮
18. flywheel *n.* 飞轮
19. flange *n.* 法兰盘
20. cover *n.* 端盖
21. chamfer *n.* 倒角
22. spoke *n.* 轮辐
23. rib *n.* 肋板
24. skateboard *n.* 滑板
25. workbench *n.* 工作台
26. prism *n.* 棱柱
27. horizontal *adj.* 水平的
28. typical part 典型零件
29. projection method 投影方法
30. engineering drawing 工程图样
31. project object 工程对象
32. working principle 工作原理
33. assembly relation 装配关系
34. axle-sleeve part 轴套类零件
35. disk-cover part 盘盖类零件
36. fork-rack part 叉架类零件
37. box part 箱体类零件
38. board-cover part 板盖类零件
39. rotary body 回转体
40. partial view 局部视图
41. partial sectional view 局部剖视图
42. sectional view 断面图
43. partial zoom view 局部放大图

- 44. full sectional view 全剖视图
- 45. open slot 开槽口
- 46. key groove 键槽
- 47. knife groove back 退刀槽
- 48. convex part 凸台
- 49. concave pit 凹坑
- 50. rounded corner 圆角
- 51. steering wheel 方向盘
- 52. gasket plate 垫板
- 53. fixed board 固定板
- 54. connecting plate 连接板
- 55. cover of box 板盖
- 56. main view 主视图
- 57. top view 俯视图
- 58. upward view 仰视图
- 59. left view 左视图
- 60. right view 右视图
- 61. molding hole 成型孔

## Notes

① Engineering drawings mean that the objects are expressed in drawings according to some projection method and technical requirements so that the shape, size, material and relative location of the project object are expressed exactly in the project technology.

工程图样就是在工程技术上,为了准确地表达工程对象的形状、大小、材料和相对位置,将物体按照一定的投影方法和技术表达在图纸上。

② Mechanical drawings are the channel for designers to express theoretical analysis, design concept, and requirements of the object. They are also the primary basis of manufacturing parts, inspecting parts, improving equipments, repairing equipments and product assembly. In addition they are the tool of exchanging information and technology, so they are called the language of engineering.

机械图样是设计者表达产品的理论分析、设计构思和要求的途径,也是产品制造、检验、设备改进、维修、安装的主要依据,另外它们是信息、技术交流的工具,因此,被喻为“工程界的语言”。

③ The common axle-sleeve parts are axes, screws, sleeves ect. . They usually consist of many different diameter rotary bodies with the same axis. Their main structural characteristics are that the axial size is longer than the radial size.

常见的轴套类零件有轴、螺杆、轴套等零件。轴套类零件由同一轴线的不同回转体组

成。该零件机构的主要特征是轴向尺寸大于径向尺寸。

## Exercises

### 1. Translate the following into Chinese.

(1) The article introduces engineering drawing concept and provides the knowledge and skills of interpreting and producing basic engineering drawings relevant to typical parts.

(2) The part pattern can express the shape, size, technical requirements and others of the parts. The assembly pattern can express working principles, assembly relations, the shape of main parts, and the name and number of each part in the assembly.

(3) They can support and contain all kinds of transmission parts, such as gears, axes and bearings. They can make them keep normal relations and the accuracy of movement. They can save lubricants to lubricant parts in the box.

### 2. Translate the following into English.

(1) 零件一般水平放置,选择零件形状特征明显的方向作为主视图的投影方向。

(2) 此类零件多数由铸造或模锻制成毛坯,经机械加工而成。

(3) 零件图上的尺寸是加工和检验零件的重要依据,是零件图的重要内容之一,是图样中指令性最强的部分。

### 3. Fill in the blanks with the proper terms from the list.

(1) \_\_\_\_\_ usually consist of many different diameter rotary bodies with the same axis. Their main structural characteristics are that the axial size is longer than the radial size.

(2) \_\_\_\_\_ are gears, handwheels, belt wheels, flywheels, flanges, and covers. The body of them usually consists of many different diameter rotary bodies. Their structural characteristics are that the radial size is bigger than the axial.

(3) \_\_\_\_\_ are gasket plates, fixed boards, skateboards, connecting plates, workbenches, and covers of a box ect.. Their body has several prisms whose height is little.

(4) \_\_\_\_\_ are the base section of the machine or parts.

(A) Board-cover parts

(B) Axle-sleeve parts

(C) Box parts

(D) Wheel-disk parts

## Translation Skills

### 科技英语翻译概述

#### 一、翻译概述

科技英语(English for Science and Technology, EST)诞生于 20 世纪 50 年代,是第

二次世界大战后科学技术迅猛发展的产物。20 世纪 70 年代以来,科技英语在国际上引起了广泛的注意和研究,目前已经发展成为一种重要的英语语体,在词汇、语法、修辞等方面具有自己的特色。对科技英语的研究始于 20 世纪 50 年代,随着科学技术的迅猛发展。科技英语注重科学性、逻辑性、正确性和严密性。因此,从事科技英语翻译时较少运用修辞手段,而是注重事实与逻辑,要求技术概念明确清楚,逻辑关系清晰突出,内容正确无误,资料准确精密,文字简洁明了,符合技术术语表达习惯,体现科技英语翻译的科学、准确、严谨的特征。

## 二、翻译的标准

对翻译的标准尽管有许多争论,但“信”和“达”,即“忠实”和“通顺”,今天已成为公认的两条翻译标准。

所谓“忠实”,首先指译文必须忠实、正确地传达原文的内容,对原文的意思既不能歪曲,也不能任意增减。内容除了指原文中所叙述的事实、说明的道理、描写的景物外,也包括作者在叙述、说明和描写过程中所反映的思想、观点、立场和感情。

所谓“通顺”,指的是译文的语言必须通顺易懂,符合汉语规范。要做到行文流畅通顺,学习者尤其要注意避免逐字死译、生搬硬套,应该在深刻领会原文意思的基础上,尽量摆脱原文形式的束缚,选用符合汉语习惯的表达方法,把原意清楚明白地表达出来。

试比较下列各句的不同译文:

In certain cases friction is an absolute necessity.

(1) 在一定场合下,摩擦是一种绝对的必需品。

(2) 在某些情况下,摩擦是必不可少的。

另一方面,也要防止片面理解“通顺”的要求,过分强调译文的流畅而不受原文意思的约束,添枝加叶,造成翻译上的自由主义。例如:

He wanted to learn, to know, to teach.

(1) 他渴望博学广闻,喜欢追根穷源,并且好为人师。

(2) 他想学习,增长知识,也愿意把知识教给别人。

## 三、理解与表达

翻译的过程主要包括理解和表达两个阶段。理解与表达不是截然分开的,而是相互联系、反复的统一过程。在翻译实践中,往往要从英语到汉语,从汉语到英语仔细推敲,反复琢磨,直到译文符合原意。

### 1. 理解阶段

翻译的关键在于理解。就科技英语的翻译而论,关键在于透彻地理解和把握住原文的内容和实质。要提高理解原文的能力,最根本的是要有丰富的词汇和坚实的语法知识,有较高的英语水平。此外,还必须拥有广博的知识,熟悉英语国家的历史文化等。为了透彻理解原文,应该注意以下几点:

(1) 结合上下文,推敲词义。

理解必须通过原文的上下文来进行。英语里一词一义的情况是很少的,只有结合上下文才能了解单词在某一特定语言环境中的确切意义,否则翻译时往往容易出错。例如:

Various speeds may be obtained by the use of large and small *pulleys*.

[误] 利用大小滑轮可以获得不同的转速。

[正] 利用大小皮带轮可以获得不同的转速。

pulley 一般作“滑轮”、“辘轳”解,但是对于机器转速应为“皮带轮”,而不是“滑轮”。

(2) 辨明语法,弄清关系。

科技英语的特点之一是句子长,语法结构复杂,因此,根据原文的句子结构,弄清每句话里的语法关系对正确理解具有重要意义。例如:

There are *no problems* in the production of such a domestic robot to which we do *not have already* the glimmering of a solution.

[误] 要生产这样的家用机器人已经毫无问题,我们对于一系列技术问题的解决现在已经不是只有一线希望了。

[正] 要生产这样的家用机器人存在着各种问题,然而这些问题的解决均已略显端倪。

(3) 理解原文所涉及的事物。

有些句子的翻译,不能单靠语法关系来理解,还必须从逻辑意义或专业内容上来判断,应该特别注意某些特有事物、典故和专门术语所表达的概念。例如:

Do you know that the bee navigates by *polarized light* and the fly controls its flight by its back wings?

[误] 你知道蜜蜂借助极光飞行,而苍蝇用后翅控制飞行吗?

[正] 你知道蜜蜂借助偏振光飞行,而苍蝇用后翅控制飞行吗?

例句中的 *polarized light* 是偏(振)光,指不同方向显示出不同特点的光线,误译为“极光”是由于不懂专业,望文生义造成的。

## 2. 表达阶段

表达阶段的任务是把已经理解的原作的内容用汉语恰如其分地重述出来。翻译时,很重要的一点是不受原文形式的束缚,而要放开思路,按照汉语的规律和习惯从容地遣词造句。因此,译者必须十分重视汉语水平的提高。

表达涉及的问题很多,这里只介绍两种最基本的方法:直译和意译。

(1) 直译。

直译是指译文采取原作的表现法,既忠于原文内容,又考虑原文形式。也就是说,在译文语言条件许可时,按照字面进行翻译。下面是一个直译的例子。

What sort of force does the sun exert on the planets which causes the planets to move according to the laws which Kepler has discovered?

[译] 太阳以什么力作用于行星,使之遵循开普勒发现的定律运行呢?

(2) 意译。

意译(*free translation*)是指通过对原文深层意蕴的理解,将原文的表层结构转化为译

文的表层结构,并且打破原文的语言形式,用译文的习惯表达形式把原文的意蕴再现出来。例如:

In fact, it may be said *that anything that is not an animal or vegetable is a mineral*.

直译:事实上,可以说不是动物或植物的任何东西便是矿物。

意译:事实上,可以说任何东西只要既不是动物又不是植物便是矿物。

应当指出,在能确切表达原作思想内容和不违背译文语言规范的前提下,直译法是有其可取之处的,但英汉两种语言差异甚大,翻译时往往需要改变原作的表达方式,即采用意译。在翻译实践中,应根据最能忠实、通顺地表达原文含义的原则,灵活机动地选用或交替使用这两种方法。

#### 四、校对和修改

理解和表达都不是一次完成的,而是通过逐步深入,最后才能达到完全理解和准确表达原作的目的。因此,表达阶段还包括校对和修改译文这一环节。校改译文是使译文符合翻译标准所必不可少的一步。校改译文时,不仅要使译文作进一步的推敲,使之符合汉语规范,而且要特别注意译文的准确性,科技文献中这点尤其重要。因此,译文只有经过再三校改,直到符合原文时,才能最后定稿。

## Reading Material

### Component Tolerances

The control of dimensions is necessary in order to ensure assembly and interchangeability of components. Tolerances are specified on critical dimensions that affect the clearance and interference fits. One method of specifying tolerances is to state the nominal dimension followed by the permissible variation. An example of a dimension could be stated as  $40.000 \pm 0.003\text{mm}$ , which means that the processing dimension must be between  $39.997\text{mm}$  and  $40.003\text{mm}$ . If the variation can vary either side of the nominal dimension, the tolerance is called a bilateral tolerance. If one tolerance is zero, the tolerance is called a unilateral tolerance.

Most organizations have general tolerances that apply to dimensions when an explicit dimension is not specified on a drawing. For processing dimensions a general tolerance may be  $\pm 0.5\text{mm}$ , so a dimension specified as  $15.0\text{mm}$  may range between  $14.5\text{mm}$  and  $15.5\text{mm}$ . Other general tolerances can be applied to features such as angles, drilled and punched holes, castings, forgings, weld beads and fillets.

When specifying a tolerance for a component, reference can be made to previous drawings or general engineering practices. Tolerances are usually specified in tolerance zones as defined in British or ISO standards.



## **New Words and Phrases**

1. component *n.* 零件
2. dimension *n.* 尺寸
3. interchangeability *n.* 互换性
4. tolerance *n.* 公差
5. clearance *n.* 间隙
6. interference fit 过盈配合
7. nominal dimension 基本尺寸
8. bilateral tolerance 双向偏差
9. unilateral tolerance 单向偏差
10. tolerance zones 公差带

## **Relative Terminology of Mechanical Drawings**

1. ES: Engineering Standardization 工程标准
2. IWS: International Workman Standard 国际工人标准
3. ISO: International Standard Organization 国际标准化组织
4. GS: General Specification 一般规格
5. A: Assembly 组装(厂)
6. S: Stamping 冲压(厂)
7. fit tolerance 配合公差
8. taper 锥度
9. drawing board, T-square, triangle 图板, 丁字尺, 和三角板
10. drawing pencil 绘图铅笔
11. compass 圆规
12. divider 分规
13. general standards of drawing 制图基本规格
14. format and form of drawing 图纸幅面及格式
15. scale 比例
16. basic conventions for lines 图线及其画法
17. dimension 尺寸标注
18. composing of dimension 尺寸组成
19. geometrical construction 几何作图
20. slope 斜度
21. arc connection 圆弧连接
22. non-circle curve 非圆曲线
23. plane figure 平面图形