机械制造专业英语文选

Jixie zhizao zhuanye yingyu wenxuan

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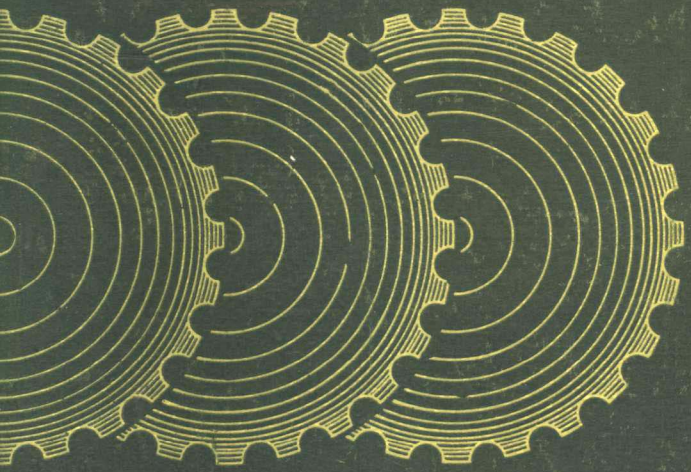

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前　言

本书供机械制造专业有一定英语基础的大学生和科技人员自学之用。全书共26课，全部选自美国七十年代的机制专业书籍，包括多方面的内容，有一定的难度。读者经过学习可以较顺利地阅读本专业的英文版书籍。

多年来，我们看到学员学完英语基础语法，掌握一定数量的单词以后，要阅读专业书籍仍有不少困难。归结起来，大致有以下三个方面：其一是生词多，查词典很费时间；而且有的词在一、两本词典中找不到有关的解释，有的词又有几个意义，难以选择，有的词和汉语不相对应，不好掌握；更有大量词组，若看作单个单词，则令人不知所云。其次是语法关系不清楚，不善于将学过的语法知识和所读的句子联系起来确切地理解其内容，有时只凭借专业知识和单词的罗列去揣摩其大意，结果往往出错。此外，即使明白了原文的意思，也往往拘泥于原文的结构而不能译成正确通顺的汉语。本书力求从这三方面帮助读者克服困难，培养阅读技巧，尽快掌握阅读专业书籍的能力。具体安排如下：

每篇课文之后列出生词表和词组。生词都用国际音标注音。全书共列生词800多个，词组200多条。书末附有总词汇表。

对书中 120 多个句子作了详细的注释。这些注释有如一位教师站在读者面前，随时为读者解释疑难、提示重点、辨别容易混淆的语言现象、总结归纳学过的有关知识、介绍阅读和翻译的方法。

课文的译文放在本书后半部，读者可在独立阅读课文之后作参考。译文比较灵活，用以帮助读者理解课文和熟悉翻译方法。

课文顺序大致按专业内容排列，读者可根据各课的篇幅大小及难易程度自行掌握学习进度。有个别课文比较容易，可用作快速阅读材料。

本书没有安排练习及副课文。读者如能同时阅读同类书籍的有关章节，定可收到相得益彰的效果。

本书编者之中，陆纪培是机制专业教师，徐景南、周季玉是英语教师，双方共同合作，希望本书在专业和语言方面都能保证质量，但本书仍难免有缺点错误，欢迎读者及识者批评指正。

编　者

Contents

1 Five Basic Techniques(I)

The variety and combinations of machine tools today are almost unlimited. Some are small enough to be mounted on a workbench[1]. Others are so large they require special buildings to house them[2]. They range in cost from a few hundred dollars to hundreds of thousands of dollars. Others, such as transfer lines, will extend for hundreds of feet through a plant.

Large or small, inexpensive or costly, machine tools can be categorized into five major classifications, identified as the five basic techniques of shaping metal[3]. These basic operations include drilling and boring (including reaming and tapping), turning, milling, planing (including shaping and broaching), and grinding (including honing). Regardless of the simplicity or complexity of a machine tool, it performs one or more of these operations. Variations of the five basic techniques are employed to meet special situations. There are, for example, machines that combine two or more of these techniques, as in a boring, drilling, and milling machine; a stamping,

punching, and shearing press, or a combination milling and planing machine. Some people add metal forming (including shearing, stamping, pressing, and forging) as a sixth basic technique. However, these processes do not involve metal removal in the form of chips. Therefore, they are not included in this text.

In addition to the five basic techniques, there are newer metal shaping methods developed during the past two decades that employ the disintegrating, corrosion, erosion, and force characteristics of chemicals, electricity, magnetism, liquids, explosives, sound, and light[4].

Drilling and Boring

Drilling is a basic machineshop technique dating back to primitive man[5]. It consists of cutting a

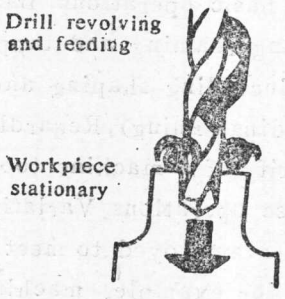

Fig. 1-1 Drilling.

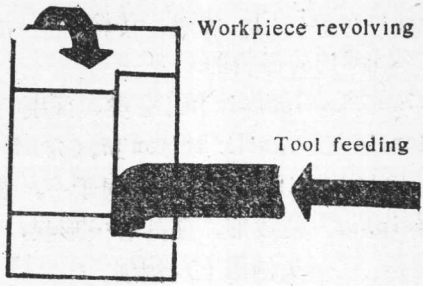

Fig. 1-2 Boring.

round hole by means of a rotating drill (Fig. 1-1). Boring, on the other hand, involves the finishing of a hole already drilled or cored by means of a rotating, offset, singlepoint tool (Fig. 1-2). On some boring machines, the tool is stationary and the work revolves; on others, the reverse is true[6].

Under the classification of drilling and boring, there are included two other types of machining techniques; reaming and tapping[7]. Reaming consists of finishing a hole already drilled, usually to very close tolerances. Tapping is the process of cutting a thread inside a hole so that a cap screw may be used in it[8].

New Words

combination[ˌkɔmbi'neiʃən]*n.* 组合，系统
house[hauz]*vt.* 放置，容纳

range[reindʒ]*vi.*（在一定范围内）变动，变化
transfer['trænsfə:]*n.*传递，传输
costly['kɔstli]*a.*昂贵的
categorize['kætigəraiz]*vt.*分类，区别
classification[,klæsifi'keiʃən]*n.*(分)类别;(分)等级
identify[ai'dentifai]*vt.* 使等同于…，认为…一致
shape[ʃeip]*vt.* 使成形，使具有…形状，制作；（在牛头刨床上）刨削
drill[dril]*vt.*钻(孔)，在…上钻孔 *n.*钻头，钻床
bore[bɔ:]*vt.*镗（孔）
ream[ri:m]*vt.*铰（孔）
tap[tæp]*vt.*在…的里面攻出螺纹
turn[tə:n]*vt.*车削；旋转 *n.*旋转，转动
mill[mil]*vt.*铣削； *n.*铣床，铣刀
plane[plein]*vt.*（在龙门刨床上）刨削 *n.*平面；刨刀 *a.*平的
broach[broutʃ]*vt.*拉削 *n.*拉刀
grind[graind]*vt.*磨削
hone[houn]*vt.*珩磨，磨光 *n.*磨石
variation[,vɛəri'eiʃən]*n.*变化（了的形式）
stamp[stæmp]*vt.*模压；锤击；冲压成形
press[pres]*vt.*冲压，模压 *n.*压床；…机床
forge[fɔ:dʒ]*vt.*锻造 *n.*锻炉
removal[ri'mu:vəl] *n.*除去，切除
punch[pʌntʃ]*vt.*穿孔，冲压 *n.*冲孔器；冲床；冲头
shear[ʃiə]*vt.*剪，切 *n.*剪床；剪刀
chip[tʃip]*n.*切屑

decade['dekeid]*n*.十年

disintegrate[dis'intigreit]*v*.（使）分裂，分解

erosion[i'rouʒən]*n*.腐蚀，磨损，冲刷

date[deit]*vi*.(back to)属（于某一历史时期）；始（于某一历史时期）

primitive['primitiv]*a*.原始的，不发达的

finish['finiʃ]*vt*.精加工；研磨；抛光　*n*.光洁度

core[kɔ:]*vt*.铸型芯，铸孔，去型芯　*n*.型芯；铁心

offset['ɔfset](offset, offset)*vt*.偏置

stationary['steiʃnəri]*a*.固定的，稳定的　*n*.固定物

revolve[ri'vɔlv]*v*.（使）旋转

reverse[ri'və:s]*n*.事物的相反面，事情的另一面　*v*.（使）倒转，反向，回动*a*.相反的，反向的；回动的

tolerance['tɔlərəns]*n*.公差

thread[θred]*n*.螺纹　*vt*.车螺纹；拧螺丝

Phrases and Expressions

machine tool	机床
such as	诸如…之类；例如
transfer line	流水线
regardless of	不管
in the form of	以…的形式
in addition to	除…之外
by means of	用，依靠
on the other hand	另一方面，而
cap screw	有帽螺钉

Notes

1. “形容词＋enough＋动词不定式”一般译作“…得足以…”，“…得可以…”，也可译作“很…，可以…”。其中 enough 是副词，作状语修饰它前面的形容词；动词不定式短语 to be mounted… 作状语修饰 enough。to be mounted 用被动态是对于 some(machine tools)而言的。

2. “so＋形容词＋that…” 意为“这样…以致于…”。其中 that 是连词，引导结果状语从句。本句中省略了that。

不定式短语 to house them 是从句中的目的状语，修饰 require。

3. Large or small, inexpensive or costly 是形容词短语，作状语。翻译时要根据它和全句的逻辑关系加上适当的词。此处应加上“不论”或“不管是”。

identified as the five basic techniques of shaping metal是过去分词短语，作定语修饰five major classifications。短语前有逗号和被修饰名词分开，是非限制性定语，翻译时一般采用分译法，即将它扩展为一个句子：“这（五种主要类别）和金属成型的五种基本技术是一致的。”

4. developed during the past two decades 是分词短语，作定语修饰 methods。that 是关系代词，它引导的定语从句也修饰methods。

5. dating back to primitive man 是分词短语，作定语修饰它前面的 technique，意为“起始于原始人的”。

6. 此处 others 等于 other boring machines。

the reverse is true 直译为“相反的情况是真实的”，一般译作“情况相反”。此处具体意思是工件固定而刀具旋

转。

7. …there are included two other types of machining technique: reaming and taping 直译为“有另外两种加工技术：铰削和攻丝，也包括在内”。这是“There be＋主语＋分词”句型，其中分词作主语的定语。本句中分词 included 放在主语前面是因为主语较长，又有同位语 reaming and taping 的缘故。

8. 连词 so that 引导目的状语从句，修饰主句中的动名词 cutting。

2 Five Basic Techniques(II)

Turning

The lathe, as the turning machine is commonly called, is the father of all machine tools[1]. Its principle has been known since the dawn of civilization. The piece of metal to be machined is rotated and the cutting tool is advanced against it(Fig. 2-1)[2].

A turret lathe differs from an engine lathe in that it is equipped with a multisided tool holder (turret) to which a number of different cutting tools are attached[3]. The turret makes it possible to bring several different cutting tools into successive use and to repeat the sequence of machining operations over and over again without resetting the tools[4].

When the number of identical parts to be turned is increased from a few to hundreds or thousands, single- and multiple-spindle automatics are used. These machines perform as many as six or eight different operations at one time on as many parts. They are entirely automatic, and once set up and put into operation, they relieve the operator of all

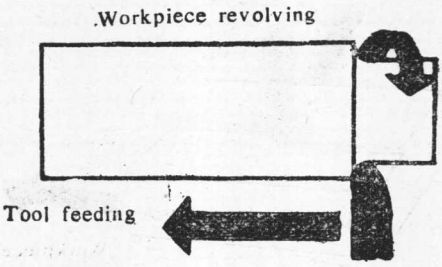

Fig. 2-1 Turning

but two duties, monitoring the operation and gaging the accuracy of finished parts[5].

Planing and Shaping

Planing metal with a machine tool is a process somewhat similar to planing wood with a carpenter's hand plane. The essential difference lies in the fact that the machine tool is greater in size, that it is not portable, and that the cutting tool remains in a fixed position while the work is moved back and forth beneath it (Fig. 2-2)[6]. Planers are usually large pieces of equipment, sometimes large enough to handle the machining of surfaces 15 to 20 feet wide and twice as long[7]. A shaper differs from a planer in that the workpiece is held stationary and the cutting tool travels back and forth.

Slotting is an operation similar to the operation performed on a shaper. Slotting, however, is performed vertically. Slotters, or vertical shapers, are used

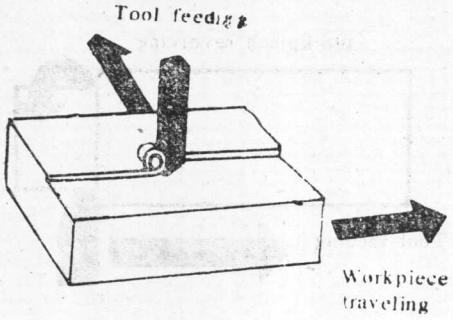

Fig. 2-2 Planing

principally to cut certain types of gears (Fig. 2-3).

Broaches may be classed as planing machines. The broach has a multiplicity of cutting teeth, each cutting-edge a little higher than the one before and graduated to the final size required[8]. The broach is pulled or pushed over the surface to be finished. It may be applied internally, for example, to finish a

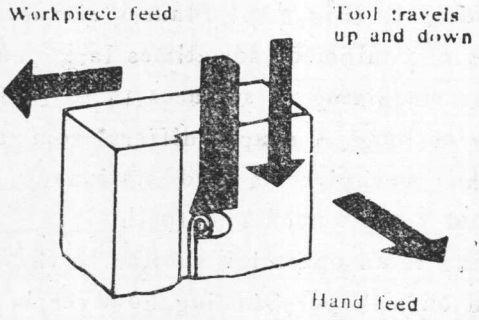

Fig. 2-3 Slotting