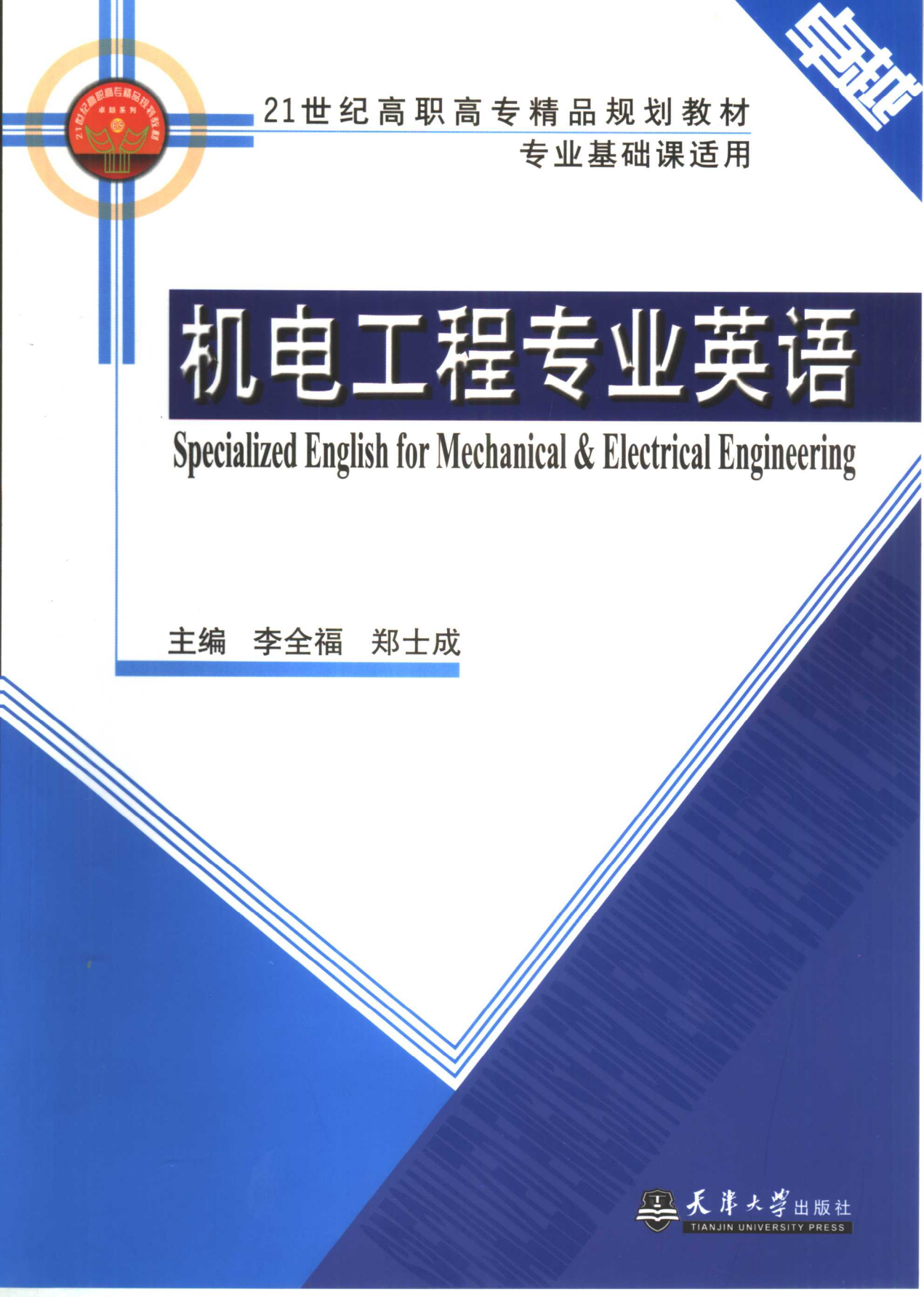
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卓越系列

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前　言

为了培养高职院校机电类专业学生具有阅读专业英语文献及实际应用专业英语的能力，以适应21世纪高职人才培养的需要，我们编写了这本机电工程专业英语。

全书分为5个单元，共20课。内容包括机床、机械设计、机械制造工艺、模具设计与制造等方面的英文材料。为了巩固专业英语词汇，每课后除列有单词和术语外，还安排了适当的练习题。本书各单元的内容相对独立，教师可以根据具体情况自行选择教学内容。

本书可作为机电类专业高职学生的专业英语教材，也可供机电类专业中职学生和相关工程技术人员参考。

本书由天津职业大学李全福和郑士成主编。参加本书编写的人员还有天津职业大学韩敏、李立国，天津电子信息学院刘正，天津中德职业技术学院赵欣，常德职业技术学院刘英姿。本书得到了天津职业大学周建波副教授和邹吉权副教授的指导和支持，石淑琴教授对本书也提出了建设性的建议，在此表示感谢。

本书由李全福统稿。

由于编者的水平有限，书中难免会有不足之处，恳请读者批评指正。

编　者

2006年5月

Contents

Unit One Machine Tools

Lesson 1 Lathe

Part A: Text

Machine tools are machines for cutting metal. The most important machine tools used in industry are lathes, drilling machines, and milling machines. Other kinds of metal working machines are not so widely used in machining metals as these three.

A lathe is a machine tool for cutting metal from the surface of a round work fastened between the two lathe centers and turning around its axis. In turning the work a cutter moves in the direction parallel to the axis of rotation of the work or at an angle to this axis, cutting off the metal from the surface of the work. This movement of the cutter is called the feed. The cutter is clamped in the tool post, which is mounted on the carriage. The carriage is the mechanism feeding the cutter in the needed direction. The lathe hand may feed the cutter by hand or may make it be fed automatically by means of special gears.

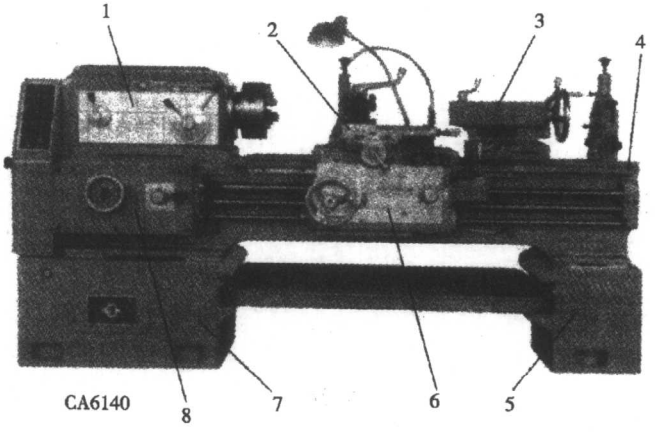

Fig.1.1 Lathe

1.headstock 2.tool post 3.tailstock 4.bed

5.right leg 6.carriage 7.left leg 8.feedstock

The largest part of the lathe is called the bed on which the headstock and the tailstock are fastened at opposite ends. On the upper part of the bed there are special ways upon which the carriage and the tailstock slide.

The two lathe centers are mounted in two spindles, one(the live center) is held in the headstock spindle while the other (the dead center) in the tailstock spindle.

The lathe chuck is used for chucking the work, that is for clamping it so that it will rotate without wobbling while turning. The chuck, usually mounted on the headstock spindle, may have different sizes and construction. If the work is perfectly round, it may be chucked in the so-called three-jaw universal chuck, all the jaws of which are moved to the center by turning the screw. But if the work is not perfectly round, the four-jaw independent chuck should be used.

On turning different materials and works of different diameters, lathes must be run at different speeds. The gear box contained in the headstock makes it possible to run the lathe at various speeds.

Before turning a work in the lathe, the lathe centers are to be aligned: that means that the axes of both centers must be on one line.

The alignment of the lathe centers may be tested by taking a cut and then measuring both ends of the cut with a micrometer.

Not all works should be fastened between the two centers of the lathe. A short work

may be turned without using the dead center, by simply chucking it properly at the spindle of the headstock.

Words and Terms

lathe *n.*	车床
machine tool	机床;工具车
drill *n.*	钻头;钻(孔)
drilling *n.*	钻削
mill *n.* & *v.*	铣刀;铣床;铣
milling *n.*	铣削
milling machine	铣床
fasten *v.*	固定;紧固
turn *v.*	旋转;车削
feed *v.*	进给;送给
cutter *n.*	(切削)刀具
clamp *v.*	紧固;夹住;夹嵌,夹板;压板
tool post	刀座;刀架
carriage *n.*	溜板;拖板
bed *n.*	床;床身
headstock *n.*	头架;车床头;主轴箱,车头箱
tailstock *n.*	尾架;尾座
slide *v.* & *n.*	滑动;滑板;滑块
metalwork *n.*	金属加工(制造)
live center	主轴顶尖
dead center	尾架顶尖
spindle *n.*	心轴,主轴
chuck *n.*	卡盘;用(卡盘)加紧
wobble *v.* & *n.*	摇晃;摇摆
jaw *n.*	卡爪,虎钳牙
three-jaw universal chuck	三爪万能卡盘
four-jaw independent chuck	四爪卡盘
align *v.*	使成一直线;校直

axis *n*.	轴线;轴心
alignment *n*.	成直线;对准;同轴线
micrometer *n*.	螺旋测微器;千分尺

Part B: Exercises

1. Answer the following questions according to the text

①What kinds of machine tools are the most useful machine tools in machining?

②What parts does an engine lathe consist of ?

③How to mount the work-piece when turning ?

④How many kinds of cutting tools are there in the lathe when machining a work-piece ?

2. Translate the following Chinese into English and English into Chinese

①车床的主轴

②横拖板的运动

③尾架顶尖

④the speed of the main spindle

⑤rotating of the feed rod

⑥rail of bed

Part C: 专业英语的词汇特点

专业英语词汇特点之一就是广泛地使用词缀和词根,甚至用词缀和词根创建新词。专业英语常用的词缀包括前缀(prefix)和后缀(suffix),具体可分为名词前缀,名词后缀和形容词词缀。前缀一般由一个或几个字母组成,放在词根或单词之前组成一个新词。每一前缀都有一定的含义,加了前缀的单词其词性一般不发生变化,只改变原来单词的意思,例如:auto-(自动)——autoalarm(自动报警),autocontrol(自控),前缀一般不超过六个字母,而后缀则是加在单词后面的词缀,一般不超过四个字母。后缀大多数只改变单词的词性,而词的意义一般不变,例如:-er(表示人、动作者、物)——designer(设计者), rectifier(整流器)。因此掌握一定量的词缀和词根就能掌握英语单词内在的结构规律,从而达到举一反三,见词识意的效果。

Lesson 2 Drills and Drilling Machines

Part A: Text

The twist drill is a very efficient tool. It is generally formed by forging and twisting grooves in a flat strip of steel or by milling a cylindrical piece of steel, high-speed steel being commonly used. High-speed steel costs more but tools made of it with stand heat much better than those made of ordinary tool steel.

The twist drill may be divided into three principal parts: shank, body and point. The flutes are the spiral grooves that are formed on the side of a drill, drills being made with two, three, or four flutes. Those having three or four flutes are used for following smaller drills or for enlarging holes already drilled, and are not suited for drilling into solid stock.

Spiral flutes have four main advantages:

1. They give the correct rake to the lip of a drill;

2. They cause the chip to curl so tightly that it occupies the minimum amount of space;

3. They form channels through which chips escape from the hole;

4. They allow the lubricant to flow easily down to the cutting edge.

The margin is the narrow strip on the cutting edge of the flute. It is practically the full diameter of the drill and extends the entire length of the flute, its surface being a part of a cylinder. The portion of the body next to the margin is of less diameter than the margin。 This lessened diameter, called body clearance, reduces the friction between the drill and the walls of the hole, While the margin insures the hole being of accurate size.

The shank is the end of the drill which fits into the socket, spindle, or chuck of the drill press. The tang is usually found only on tapered shank tools.

The drilling machine is the second oldest machine tool, having been invented shortly after the lathe, and is one of the most common and useful machines. The drilling machines may be classified into three general type: Vertical Spindle, Multiple Spindle, and Radial Spindle machines. The Vertical Spindle Drilling Machine comes in three types: heavy duty, plain, and sensitive.

Besides the drilling of holes, such operations may be performed on the drilling

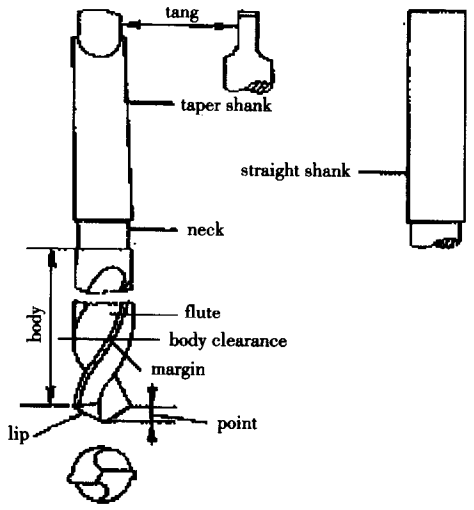

Fig.2.1 Part of the Twist Drill

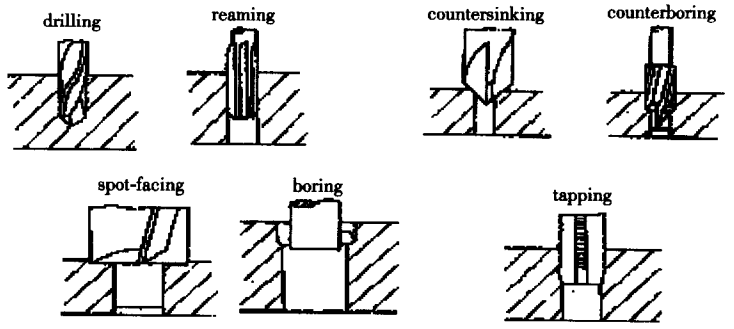

Fig.2.2 Drilling Machine Operations

machine:(Fig.2.2)tapping(internal threading), reaming (finishing the hole with a reamer), countersinking, counterboring, boring and spot-facing.

Words and Terms

twist drill	麻花钻
efficient *a*.	有效的,高效的
strip *n*.	带,条,细长片
principal *a*.	主要的,重要的

body *n*.	体,钻体
shank *n*.	钻柄,钻头插入柄中的凸出部分
point *n*.	针尖,刀尖,钻尖
flute *n*.	凹槽,螺旋槽
spiral *a*.	螺旋(形)的,螺纹的
spiral groove	螺旋槽
enlarge *v*.	放大,扩大
rake *n*.	前角
lip *v*.	唇,边缘,端,刀刃,切削刃
chip *n*. & *v*.	切削,碎片;削,剥落
curl *v*.	使卷曲,使卷边
channel *n*.	通道,沟槽
lubricant *n*.	润滑剂
margin *n*.	刃带,边界,界限
lessen *v*.	减轻,缩小
body clearance	钻体间隙
socket *n*.	钻套,插口
drill press	钻床
tang *n*.	柄舌
sensitive *a*.	敏感的
tapping *n*.	攻丝,车螺纹
reaming *n*.	铰孔
reamer *n*.	铰刀
countersinking *n*.	尖底锪钻
counterboring *n*.	平底锪钻
boring *n*.	镗孔
spot facing	锪端面

Part B: Exercises

1. Answer the following questions according to the text

①What steels are twist drills generally made of?

②What are the principle parts of a twist drill?

③What is the margin?

④Why is the body clearance made on drill?

⑤What is the shank of a drill?

2. Translate the following terms into English

①麻花钻　　⑥润滑
②钻柄　　⑦重型钻床
③螺旋槽　　⑧普通钻床
④钻床　　⑨立式钻床
⑤攻丝　　⑩高速手压台钻

3. Translate the following into Chinese

①The Vertical Spindle Drilling Machine comes in three types : heavy duty, plain and sensitive.

②The twist drill is generally formed by forging and twisting grooves in a flat strip of steel or by milling a cylindrical piece of steel, high-speed steel being commonly used.

Part C: 专业英语常用词缀(prefix, suffix)

1. 名词前缀

前缀	意义	词例
aero-	空气	aeroplane 飞机;airport 机场
auto-	自己,自动	automation 自动化;autoalarm 自动报警
bi-	双,二	binary 二进制
bio-	生物	bionics 仿生学;biosatellite 载生物卫星
by-	边,侧,偏,副,	by-product 副产品;by-effect 副作用
centi-	百分之一	centimeter 厘米
counter-	反,抗,对应	counteraction 反作用
deci-	10%, 十分之一	decigram 十分之一克;decimeter 分米
di-	二,双,偶	dimensions 二维;diode 二极管
hecto-	一百	hectowatt 百瓦;hectoamper 一百安培
hexa-	六	hexadecimal 十六;hexagon 六角形
in-	入	input 输入;intake 吸入

inter-	相互	interface 接口；internet 互联网
kilo-	千	kilometer 公里，千米；kilogram 千克
macro-	大	macrocode 宏代码
milli-	毫，千分之一	milliammeter 毫安表；milligram 毫克
mini-	小	minicomputer 小型计算机
mono-	单一	monoplane 单翼飞机；monotone 单调
multi-	多	multiphase 多方面；multifrequency 多频率
non-	不，非，无	nonmetal 非金属；nonstandard 非标准
poly-	多，复，聚	polycrystal 多晶体
post-	后	postscript 附言，附录
re-	再，重	reproduction 再生产
semi-	半	semiconductor 半导体
sub-	子，亚，次	subprogram 子程序
super-	超	superpower 超功率；superprofit 超额利润
tri-	三	triangle 三角形；tricycle 三轮脚踏车
tele-	远	telescope 望远镜；teleswitch 遥控开关
ultra-	超	ultrahigh frequency 超高频
vice-	副，次，代理	vice-chairman 副主席；vice-manager 副经理

2.名词后缀

后缀	意义	词例
-acity	表示“性质”，“状态”	capacity 容量
-acy	表示“性质”，“状态”	determinacy 确定性
-age	表示抽象概念，如“性质”，“状态”等	voltage 电压
-al	表示“行为”	refusal 拒绝；proposal 提议；removal 除去
-ance，-ence	表示“性质”，“状态”	resistance 电阻；difference 差别
-ency	表示“性质”，“品质”	efficiency 效率，功效
-cy	表示“性质”，“状态”	accuracy 精确度
-ic，-ics	表示学科，…学	electronics 电子学；physics 物理学
-ing	表示动作的结果	reading 读数；recording 记录
-ion，-tion，	表示“行为”，“过程”	
-sion，-xion	表示“行为”，“状态”	connection 连接，链接

-ist	表示“…主义者”	socialist 社会主义者；scientist 科学家
-ity	表示“性质”，“状态”	electricity 电；conductivity 传导率
-ment	表示“性质”，“状态”，“动作”等	equipment 设备；measurement 测量
-ness	表示“状态”，“性质”	effectiveness 效率
-or	表示“人”，“动作者”，“物”	conductor 导体；operator 操作员
-ship	表示“状态”，“立场”	relationship 关系；leadership 领导
-th	表示“动作”，“性质”，“状态”	growth 增长
-ure	表示“行为”，“状态”，“状况”	pressure 压力；failure 失败

3.形容词后缀

后缀	意义	词例
-able	可以的，能…的	readable 可读的；controllable 可控制的
-al	…的	digital 数字的；virtual 事实上的
-ary	表示“状态”，“性质”	secondary 次要的；ordinary 平常的
-ed	有…的	extended 扩展的
-ic，-ical	类似…的	atomic 原子的；systematical 有系统的
-ive	…的	conducive 传导的；resistive 电阻的
-less	无…的	useless 无用的；wireless 无线的

4. 动词后缀

后缀	意义	词例
-ate	做，造成，使…	facilitate 标准；促进
-en	做…	broaden 加宽；harden 硬化；deepen 加深
-fy	使成为…化	simplify 简化；electrify 使…带电
-ize	使…化	standardize 使…标准化；minimize 最小化

5.副词后缀

后缀	意义	词例
-ly	…地	hourly 每小时地；quickly 快地

Lesson 3 Milling Machines

Part A: Text

The milling machine is a machine that removes metal from the work with a revolving milling cutter as the work is fed against it. The milling cutter is mounted on an arbor where it is held in place by spacers or bushings. The arbor is fixed in the spindle with one end, while the other end of the arbor rotates in the bearing mounted on the arbor yoke.

The milling cutters are generally made from high speed steel and are available in different sizes and shapes. There are such kinds of milling cutters (Fig. 3.1) as cylindrical cutters, end milling cutters(for face milling), forming milling cutters, angular cutters, side and face cutters, slitting saw, etc. These cutters may differ in the direction of their

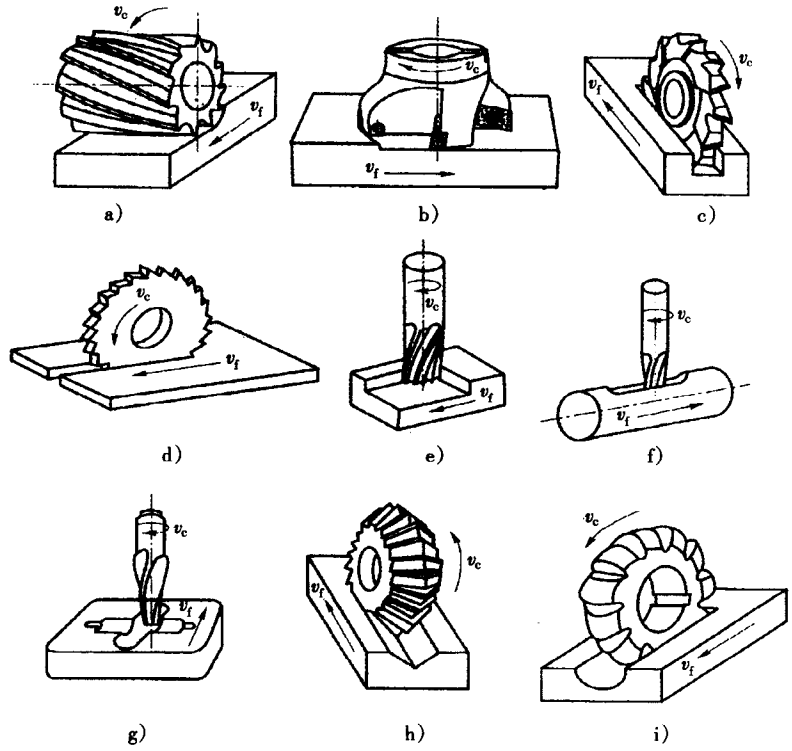

Fig. 3.1 Type of Milling Cutter

operation, i.e. they may cut revolving either clockwise or counter-clockwise.

Regular or irregular shaped work may be produced on a milling machine, designs varying according to the particular class of work wanted. According to the position of the spindle, the milling machines may be divided into two groups of vertical spindle milling machines and horizontal spindle milling machines. milling machines may be grouped into various classes according to the variation in general design as the "column and knee type", the manufacturing types, and the planer type of milling machine. According to the table design, the milling machines may be classified as Universal and Plain Milling Machines.

The most important parts of the milling machine are : ①starting levers; ②spindle; ③column; ④knee; ⑤elevating screw; ⑥table; ⑦index head; ⑧speed levers; ⑨feed levers; ⑩table movement levers; ⑪foot stock; ⑫arbor yoke.

The spindle of the milling machine is driven by an electric motor through a train of gears mounted in the column. The table of the Plain Milling Machine may travel only at right angles to the spindle while the Universal Milling Machine(Fig 3.2)is provided with a table that may be swiveled on the transverse slide for milling gear teeth, threads, etc.

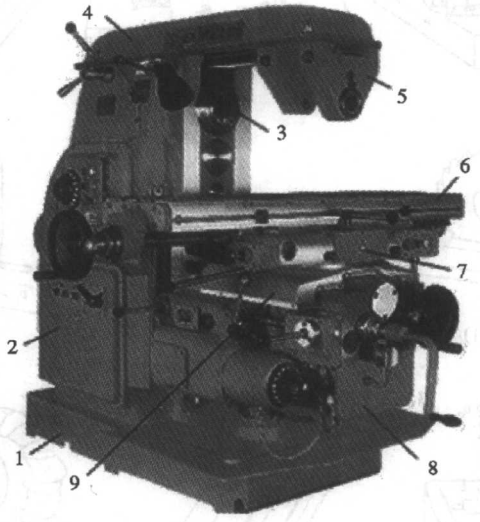

Fig.3.2 Universal Milling Machine

1. base 2. column 3. spindle 4. ram
5. arbor yoke 6. table 7. transverse feed 8. knee