



工业和信息化部职业教育指导委员会“十二五”规划教材
新编高等职业教育电子信息、机电类规划教材



机电一体化技术专业

机械专业交际英语

汤彩萍 编 著
Satina Anziano(美) 主 审

教学理念和教学方法:

- ◆听说交际;任务驱动;行动导向;多媒体教学
- ◆综合职业能力培养;语言应用性;边学边做边说

编写框架:阅读;听力;口语/写作;语法与翻译;课外作业

编写特色:

- ▲8个学习情境;随书配光盘,纯正美国口语;采用工作页
- ▲全面提升学生的听、说、读、写、译的英语基本技能

免费提供电子教案、教学参考、视听文字、参考解答



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内 容 提 要

本书基于机械类专业工作岗位对英语能力的需求,立足“能力本位”,以交际性为特色,突出专业英语的听说口语表达能力和专业应用文写作能力的训练,并以此为推手促进学习者专业英语阅读与翻译能力及学习兴趣的提高。

本书共分 8 个学习情境,是根据机械行业的典型工作情境和职业场景设计的。学习情境从机械工职业就业展开,学习者以普通车床和数控加工中心为主要学习设备来学习机床的相关操作,追随当今机械制造业的高度自动化和网络化趋势,领略自动化工厂的运行,参加国际机床展览会,开展技术交流与合作,最后以毕业生就业面试而结束课程的学习。全书前后呼应,融会贯通。情境的听、说、读、写、译各部分紧扣同一主题展开,任务驱动,行动导向。

本书配备光盘,包含阅读和视听说等多媒体教学材料,以此提高教学效率。

本书适合职业院校、成人高校的机械制造与自动化类专业、数控技术类专业、机电设备类专业选用,也适合从事机械技术或产品营销的社会人员学习使用,是训练机械类专业英语口语和听说能力的好帮手。

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前言

高职英语教育是培养技能型人才的高等英语教育，旨在训练其在生产、管理、服务第一线所需的语言交际能力和应对各种涉外局面的语言应用能力。在当今职业教育大发展大改革的浪潮下，高职英语课程应根据本专业工作岗位的实际需要，立足“能力本位”，以综合职业能力培养为目的，工学结合，帮助学生掌握本专业听、说、读、写、译的语言基本技能，实现高职人才的培养目标。

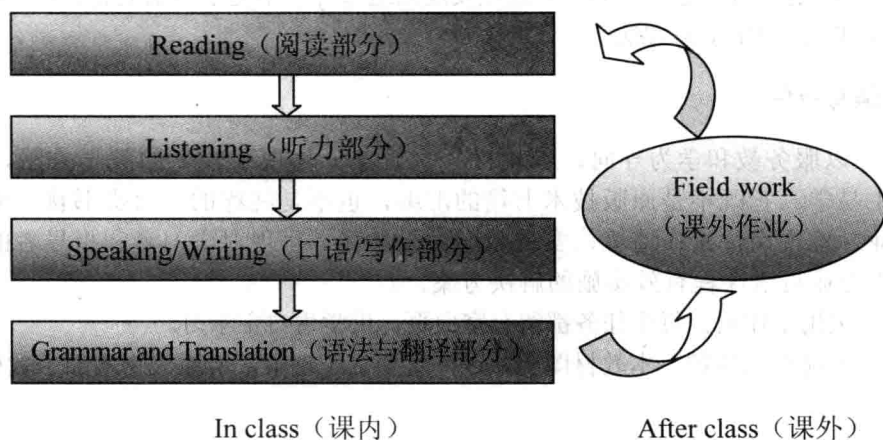
《机械专业交际英语》教材顺应潮流，颠覆了原有专业英语只强调阅读理解和翻译能力培养的教学理念，而以交际性为特色，突出专业英语的听说口语表达能力和专业应用文写作能力的训练，并以此为推手促进学生阅读翻译能力和学习兴趣的提高。

1. 情境设计

本教材根据机械行业高职人才的典型工作情境和职业场景设计了 8 个学习情境（Learning Situation，简称 LS）。学习情境从机械工职业就业展开，学习者以普通车床和数控加工中心为主要学习设备，学习机床的操作，追随当今机械制造业的高度自动化和网络化的趋势，领略自动化工厂的运行，参加国际机床展览会，开展技术交流与合作，最后以毕业生就业面试而结束课程的学习。全书前后呼应，融会贯通。

2. 情境架构

各情境编写框架示意图如下：



情境的各部分紧扣同一主题展开，Reading 为后续 Listening 和 Speaking 提供专业背景材料和专业词汇储备，Field work 的完成时间贯穿整个情境的学习过程。

3. 教学理念和方法

本教材体现以下教学理念和教学方法如下。

(1) 听说交际。遵循语言教学规律,以岗位需要的听说能力训练为抓手展开英语教学。听力材料的选取围绕情境主题,选择原汁原味的英文原声录像。口语任务的设计呈现递进层次:如,看图说话,小对话,情境对话。

(2) 任务驱动,行动导向。借鉴普通英语教学法设计了丰富的听、说、读、写、译学习任务或趣味游戏活动(如,小组竞赛、角色表演、配音比赛等),以专业内容为载体训练学生的英语综合应用能力,学生成为学习的主体。任务来自于岗位工作分析,如,实际技术交流中经常会遇到符号或数字的读法问题,因此在 LS3 中设计了数字阅读的口语题。

任务形式多样,阅读训练题型达二十种,听力训练主要是根据视听材料完成填空、选择、回答问题等任务,口语训练主要有看图说话、互相提问和回答、情境对话、PPT 汇报、视频配音等,写作训练有英文摘要和英文简历书写,翻译有专业材料的英译中或中译英。

(3) 多媒体教学。本教材配备光盘,其中包含了课文朗读、生词发音、视听和口语材料,是实现多媒体教学的支撑。

(4) 综合职业能力培养。以结对或小组学习,培养合作能力、表达能力。Reading 部分注重专业能力的培养,而 Listening 和 Speaking 部分则侧重方法能力和社会能力的培养。

(5) 语言应用性。本教材将普通英语与专业有机融合,学习者既学语言,又学专业,用英语表达专业(听说写),用英语寻求技术答案(读译)。

(6) 边学边做边说。引入企业员工培训理念,借鉴日本产业训练协会 TWI 工作指导方法(Job Instruction)训练学生口语,如,根据课文说明操作机床,边做边说。

(7) 遵循外语教学规律。由于外语学习有较多的记忆任务,采用机械式背诵记忆令学生乏味,本教材对于同一学习要点,采用了形式多样的任务形式,使学生在反复训练中掌握了学习重点。

(8) 学习难度。本教材与较老的专业英语教材相比,突出了英语的交际特色,而专业性内容则相对浅显,难度大大降低,使学生在对专业内容较熟悉的情况下,快速获得专业英语应用能力,这也为普通英语师资专业化发展创造条件。不追求语法的完整和系统性,只就专业英语的特点提出学习方法。

4. 编写特色

(1) 以服务教和学为导向。本教材(含光盘)体现了较多的教学方法,让教师好教,学生易学。它既不是原版技术书籍的汇编,也不是纯粹的语言类书籍,而是包含语言和专业、体现岗位工作情境、实现教学做一体化、呈现对学习者和指导者的关心、高职机械类专业英语课程有效实施的解决方案。

(2) 采用工作页。每个任务都留有空白页,供学生自主学习。

(3) 表现形式新颖。本教材图文并茂,直观易于理解,卡通人物增加了教材活泼和趣味性。

5. 适用范围

本教材适合职业院校、成人高校的机械制造与自动化类专业、数控技术类专业、机电设备类专业选用,也适合从事机械技术或产品营销的社会人员学习使用,尤其是训练机械类专业口语和听说能力的好帮手。本教材建议总学时 60,可根据实际专业课程设置情况选学部分内容。

6. 致谢

本教材由美籍语言学硕士 Satina Anziano 女士担任主审。在编写过程中得到了常州创胜特尔数控机床设备有限公司赖立迅总工程师、德国博世力士乐公司 Tim Hohlmann 先生和吴宏娟女士的大力帮助，并得到了这些单位的支持；还得到了常州机电职业技术学院许朝山、茆晓兵、于华艳、靳敏、金志国、陶波等老师的热情帮助，在此一并表示感谢。

由于作者学识和经验有限，书中难免有错误与不妥之处，恳请使用者批评指正！同时，作者乐意为教师提供电子教案、教学参考、视听文字稿、参考解答等教学资源。

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汤彩萍

2010 年 12 月

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Learning Situation

What machinists do



Focus of the situation

This class will discuss the job employment of machinists in the mechanical manufacturing field in terms of work procedures, job safety, and job prospects. [本类从工作内容、工作安全、就业前景等方面讨论机械制造领域机械工的工作与就业。]

Field work

How much do you know about employment opportunities related to the mechanical trade? What are you going to do in the future? Make a PPT and prepare for an in-class presentation.

Part A Reading

Machinists use machine tools, such as lathes, milling machines, and machining centers, to produce precision metal parts¹. Although they may produce large quantities of one part, precision machinists often produce small batches or one-of-a-kind items. They use their knowledge of the working properties of metals and their skill with machine tools to plan and carry out the operations needed to make machined products that meet precise specifications².

Before they machine a part, machinists must carefully plan and prepare the operation³. These workers first review blueprints or written specifications for a job. Next, they calculate where to cut or bore into the workpiece, how fast to feed the metal into the machine, and how much metal to remove. They then select tools and materials for the job, plan the sequence of cutting and finishing operations, and mark the metal stock to show where cuts should be made⁴.

After this layout work is completed, machinists perform the necessary machining operations. They position the metal stock on the machine tool—drill press, lathe, milling machine, or other type of machine—set the controls, and make the cuts. During the machining process, they must constantly monitor the feed rate and speed of the machine. Machinists also ensure that the workpiece is being properly lubricated and cooled, because the machining of metal products generates a significant amount of heat. The temperature of the workpiece is a key concern because most metals expand when heated; machinists must adjust the size of their cuts relative to the temperature⁵. Some rare but increasingly popular metals, such as titanium, are machined at extremely high temperatures.

Machinists detect some problems by listening for specific sounds—for example, a dull cutting tool or excessive vibration. Dull cutting tools are removed and replaced. Cutting speeds are adjusted to compensate for harmonic vibrations, which can decrease the accuracy of cuts, particularly on newer high-speed spindles and lathes⁶. After the work is completed, machinists use both simple and highly sophisticated measuring tools to check the accuracy of their work against blueprints.

CNC machinists

Some machinists, often called production machinists, may produce large quantities of one part, especially parts requiring the use of complex operations and great precision. Many modern machine tools are computer numerically controlled (CNC). Frequently, machinists work with computer-control programmers to determine how the automated equipment will cut a part. The programmer may determine the path of the cut, while the machinist determines the type of the cutting tool, the speed of the cutting tool, and the feed rate. Because most machinists train in CNC programming, they may write basic programs themselves and often modify programs in response to problems encountered during test runs⁷. After the production process is designed, relatively simple and repetitive operations normally are performed by machine setters, operators, and tenders.

Some manufacturing techniques employ automated parts loaders, automatic tool changers, and computer controls, allowing machine tools to operate without anyone present. One production machinist, working 8 hours a day, might monitor equipment, replace worn cutting tools, check the accuracy of parts being produced, and perform other tasks on several CNC machines that operate

24 hours a day (lights-out manufacturing). During lights-out manufacturing, a factory may need only a few machinists to monitor the entire factory.

Maintenance machinists

Other machinists, often called mechanics, do maintenance work—repairing or making new parts for existing machinery. To repair a broken part, maintenance machinists may refer to blueprints and perform the same machining operations needed to create the original part.

I can make a good wage and develop a rewarding career working as a machinist.



Work safety

Today, most machine shops are relatively clean, well lit, and ventilated. Many computer-controlled machines are partially or totally enclosed, minimizing the exposure of workers to noise, debris, and the lubricants used to cool workpieces during machining. Nevertheless, working around machine tools presents certain dangers, and workers must follow safety precautions. Machinists wear protective equipment, such as safety glasses to shield against bits of flying metal and earplugs to dampen machinery noise. They also must exercise caution when handling hazardous coolants and lubricants, although many common water-based lubricants present little hazard. The job requires stamina, because machinists stand most of the day and, at times, may need to lift moderately heavy workpieces.

Job opportunities

Job opportunities for machinists should continue to be good, as employers value the wide-ranging skills of these workers. Also, many young people prefer to attend college or may not wish to enter production occupations. Therefore, the number of workers learning to be machinists is expected to be less than the number of job openings arising each year from the need to replace experienced machinists who retire or transfer to other occupations⁸.

So don't hesitate any longer, and let's get into the machine shop right now.

TECHNICAL WORDS

machinist	[mə'ʃi:nɪst]	n.	机械工, 机械师
lathe	[leið]	n.	车床
mill	[mil]	v. & n.	铣削; 铣刀; 铣床
machine	[mə'ʃi:n]	n. & v.	机器, 机械; 机床; 机加工
precision	[pri'sɪʒən]	n.	精密, 精度
property	['prɒpəti]	n.	属性, 特性
specification	[.spesifi'keɪʃən]	n.	规格

blueprint	['blu:prɪnt]	<i>n.</i>	蓝图
job	[dʒɒb]	<i>n.</i>	工作 (任务), 作业, 零件活
bore	[bɔ:]	<i>v.</i>	镗孔, 钻孔
workpiece	['wɜ:kpi:s]	<i>n.</i>	工件, 加工件
feed	[fi:d]	<i>n. & v.</i>	进给, 切入
stock	[stɒk]	<i>n.</i>	毛坯, 余量; 库存
position	[pə'ziʃən]	<i>n. & v.</i>	位置, 岗位; 定位
drill	[drɪl]	<i>v. & n.</i>	钻削; 钻头; 钻床
lubricate	['lu:brikeit]	<i>v.</i>	润滑
cool	[ku:l]	<i>v.</i>	冷却
vibration	[vai'breɪʃən]	<i>n.</i>	振动
compensate	['kɒmpənsaɪt]	<i>v.</i>	补偿
accuracy	['ækjʊrəsi]	<i>n.</i>	精度
spindle	['spɪndl]	<i>n.</i>	主轴
modify	['mɒdɪfaɪ]	<i>v.</i>	修改
manufacture	[,mænju'fæktʃə]	<i>v.</i>	制造
technique	[tek'ni:k]	<i>n.</i>	技术, 技巧, 方法
employ	[im'plɔɪ]	<i>v.</i>	雇用, 使用
operator	['ɒpəreɪtə]	<i>n.</i>	操作员
maintenance	['meɪntɪnəns]	<i>n.</i>	维护, 保养
machinery	[mə'ʃi:nəri]	<i>n.</i>	机械, 机器 (不可数名词)
create	[kri'eɪt]	<i>v.</i>	制造, 创建
mechanic	[mi'kænik]	<i>n.</i>	机修工
ventilate	['ventɪleɪt]	<i>v.</i>	通风
lubricant	['lu:brikənt]	<i>n.</i>	润滑油
coolant	['ku:lənt]	<i>n.</i>	冷却液

PHRASES

machine tool	机床
milling machine	铣床
machining center	加工中心
small batches or one-of-a-kind items	单件小批量
finishing operation	精加工操作
drill press	台式钻床

feed rate		进给速度
cutting tool		刀具
cutting speed		切削速度
harmonic vibration		谐振
computer numerically controlled	(CNC)	数控
computer-control programmer		数控编程员
test run		试运行
automatic tool changer	(ATC)	自动换刀装置
computer control		计算机数控系统
machine setter		机床调试工
machine tender		机床放料工
worn cutting tool		磨损刀具
lights-out manufacturing		无人值守制造, 自动化制造
machine shop		车间
computer-controlled machine		数控机床
safety precaution		安全预防
safety glasses		安全眼镜

NOTES

1. Machinists use **machine tools**, such as lathes, milling machines, and machining centers, to produce precision metal parts. 机械工使用诸如车床、铣床和加工中心等机床制造精密金属零件。机床是制造各种机器 (*machine*) 的工具, 被称为工作母机, 因此英语里的“机床”往往用 “*machine tool*” 来表达。

2. They use their knowledge of the working properties of metals and their skill with machine tools to plan and carry out the operations **needed** to make **machined products that meet precise specifications**. 他们运用其金属材料特性方面的知识和机床方面的技能进行工艺规划和加工, 制造满足精度要求的机加工产品。*needed* 为过去分词, 作后置定语, 修饰 *operations*, 相当于定语从句 *that are needed*; *that meet precise specifications* 是定语从句, 修饰 *products*。*machined products* 中 *machined* 是过去分词作定语。

3. Before they machine a part, machinists must carefully plan and prepare the operation. 加工零件之前, 机械工必须对整个加工过程进行仔细的规划和准备。

4. These workers **first** review blueprints or written specifications for a job. **Next**, they calculate where to cut or bore into the workpiece, how fast to feed the metal into the machine, and how much metal to remove. They **then** select tools and materials for the job, plan the sequence of cutting and finishing operations, and mark the metal stock to show where cuts should be made. 首先, 这些工人阅读作业零件的图纸或书面说明; 接下来, 他们计算切入或钻入工件的位置、工件的进给速度、金属的去除量; 然后, 他们选择适合工件的刀具和材料, 制订粗加工和精

加工操作的顺序，在金属毛坯上画线标记切削位置。需要表达工作步骤时，可以用 *first...next...then... 或 before..., after...*。

5. The temperature of the workpiece is a key concern because most metals expand **when heated**; machinists must adjust the size of their cuts relative to the temperature. 因为大多数金属受热后都会膨胀，所以工件的温度是主要关注的问题；机械工必须基于温度调整切削用量。*when heated 相当于 when they are heated, heated 为过去分词，表示被动。*

6. Cutting speeds are adjusted to compensate for harmonic vibrations, **which can decrease the accuracy of cuts**, particularly on newer high-speed spindles and lathes. 调整切削速度以补偿谐振造成的误差，谐振会降低切削精度，尤其在一些新型的高速主轴和车床上。*which can decrease the accuracy of cuts 是定语从句，修饰 harmonic vibrations。*

7. Because most machinists train in CNC programming, they may write basic programs themselves and often modify programs in response to problems **encountered** during test runs. 由于大多数机械工都接受过数控编程的培训，他们会编写基本的程序，试运行过程中，经常修改程序以应对碰到的问题。*encountered 为过去分词，作后置定语，修饰 problems。*

8. Therefore, the number of workers **learning to be machinists** is expected to be less than the number of job openings **arising each year from the need to replace experienced machinists who retire or transfer to other occupations**. 每年都有一些有经验的机械师退休或跳槽到其他职业，因此带来的工作空缺数量大于准备从事机械工工作的工人数量。*learning to be machinists 是 workers 的定语，arising each year from the need 是 job openings 的定语，to replace experienced machinists 是 need 的定语，定语从句 who retire or transfer to other occupations 修饰 experienced machinists。这句话结构比较复杂，翻译比较困难，但只要通过分析语法，就能理解其含义，然后再意译成通顺的汉语。*

PRACTICE

Task 1 Translate the following words into English.

- | | |
|------------|-------------|
| 1. 精密零件 | 2. 加工零件(v.) |
| 3. 精加工 | 4. 金属毛坯 |
| 5. 进给速度 | 6. 更换刀具 |
| 7. 维修机械工 | 8. 符合规格 |
| 9. 修改程序 | 10. 遇到问题 |
| 11. 数控机床 | 12. 加工中心 |
| 13. 车床 | 14. 铣床 |
| 15. 镗床 | 16. 钻床 |
| 17. 强烈的振动 | 18. 完成功能 |
| 19. 完成操作 | 20. 完成任务 |
| 21. 冷却(n.) | 22. 润滑(n.) |
| 23. 高精度 | 24. 高速主轴 |
| 25. 切削路线 | 26. 全封闭 |

27. 无人化制造

28. 数控系统

29. 数控编程（员）

30. 数控操作（员）

Task 2 Fill in the brackets with words that have similar meaning to the underlined words, changing their forms if necessary.

1. () Machinists use machine tools, such as lathes, milling machines, and machining centers, to produce precision metal parts.

2. () Machinists use machine tools, such as lathes, milling machines, and machining centers, to produce precision metal parts.

3. () They use their knowledge of the working properties of metals and their skill with machine tools to plan and carry out the operations needed to make machined products that meet precise specifications.

4. () One production machinist might monitor equipment, replace worn cutting tools, check the accuracy of parts being produced, and perform other tasks on several CNC machines.

5. () After the work is completed, machinists use both simple and highly sophisticated measuring tools to check the accuracy of their work against blueprints.

6. () Machinists may write basic programs themselves and often modify programs in response to problems encountered during test runs.

7. () Machinists may write basic programs themselves and often modify programs in response to problems encountered during test runs.

8. () Machinists also ensure that the workpiece is being properly lubricated and cooled, because the machining of metal products generates a significant amount of heat.

9. () Some manufacturing techniques employ automated parts loaders, automatic tool changers, and computer controls, allowing machine tools to operate without anyone present.

10. () Other machinists do maintenance work—repairing or making new parts for existing machinery.

11. () The job requires stamina (体力), because machinists stand most of the day and, at times, may need to lift moderately heavy workpieces.

12. () Machinists must exercise caution when handling hazardous coolants and lubricants, although many common water-based lubricants present little hazard.

13. () Machinists must exercise caution when handling hazardous coolants and lubricants, although many common water-based lubricants present little hazard.

14. () To repair a broken part, maintenance machinists may refer to blueprints and perform the same machining operations needed to create the original part.

15. () During lights-out manufacturing, a factory may need only a few machinists to monitor the entire factory.

16. () They design and carry out the operations needed to make machined products that meet precise specifications.

17. () Machinists use machine tools, such as lathes, milling machines, and machining centers, to produce precision metal parts.

18. () Machinists use both simple and highly sophisticated measuring tools to check the accuracy of their work against blueprints.

19. () The temperature of the workpiece is a key concern because most metals expand when heated; machinists must adjust the size of their cuts relative to the temperature.

20. () These workers first review blueprints or written specifications for a job.

Task 3 Choose the correct English explanation for each of the following words.

1. Lathe

(A) is a machine that turns a piece of metal round and round against a sharp tool that gives it shape.

(B) is the motion of moving the work piece and the cutting tool together so as to remove material.

(C) is the operation of enlarging a hole with a single-point tool. This operation produces a close tolerance (公差) and fine (精细的) finish.

Your answer: _____

2. Milling machine

(A) is a machine that turns a piece of metal round and round against a sharp tool that gives it shape.

(B) is a machine that removes metal through the use of electrical sparks (电火花) which burn away the metal.

(C) is a machine tool that removes material by rotating a cutter and moving into the material. It is used to produce flat and angular surfaces, grooves (槽), contours (轮廓), and gears.

Your answer: _____

3. Boring

(A) is a machine that turns a piece of metal round and round against a sharp tool that gives it shape.

(B) is the process or technique of reducing wear (磨损) between surfaces by using a lubricant (润滑剂) between the surfaces.

(C) is the operation of enlarging a hole with a single-point tool. This operation produces a close tolerance and fine finish.

Your answer: _____

4. Feed

(A) is the motion of moving the work piece and the cutting tool together so as to remove material.

(B) is the process or technique of reducing wear between surfaces by using a lubricant between the surfaces.

(C) is the operation of enlarging a hole with a single-point tool. This operation produces a close tolerance and fine finish.

Your answer: _____

5. CNC

(A) is a special liquid that performs three main functions during machining. It lubricates the

cutting action, carries off the heat generated, and flushes (冲洗) the chips (切屑) .

(B) is a form of programmable automation in which the machine tool is controlled by a program in computer memory.

(C) is the process of removing metal with machine tools such as lathes, mills and a wide variety of other tools.

Your answer: _____

6. Lubrication

(A) is the process or technique of reducing wear between surfaces by using a lubricant between the surfaces.

(B) is a special liquid that performs three main functions during machining. It lubricates the cutting action, carries off the heat generated, and flushes the chips.

(C) is the material being machined. It can be any material and any shape. In the machine shop it usually refers to round or flat pieces of metal ready to be machined.

Your answer: _____

7. Coolant

(A) is the process or technique employed to reduce wear between surfaces by using a lubricant between the surfaces.

(B) is a special liquid that performs three main functions during machining. It lubricates the cutting action, carries off the heat generated, and flushes the chips.

(C) is the material being machined. It can be any material and any shape. In the machine shop it usually refers to round or flat pieces of metal ready to be machined.

Your answer: _____

8. Stock

(A) is the process or technique employed to reduce wear between surfaces by using a lubricant between the surfaces.

(B) is that portion (一部分) of a machine tool that spins (旋转) either the workpiece or the cutting tool and is driven by the motor. On a milling machine, it turns within the quill (套筒) while on a lathe it turns within the headstock (床头箱) .

(C) is the material being machined. It can be any material and any shape. In the machine shop it usually refers to round or flat pieces of metal ready to be machined.

Your answer: _____

9. Spindle

(A) is a special liquid that performs three main functions during machining. It lubricates the cutting action, cools the cutting action, and flushes the chips.

(B) is that portion of a machine tool that spins either the workpiece or the cutting tool and is driven by the motor. On a milling machine it turns within the quill while on a lathe it turns within the headstock.

(C) is the material being machined. It can be any material and any shape. In the machine shop it usually refers to round or flat pieces of metal ready to be machined.

Your answer: _____