

图说技术英语系列丛书

图说

模具技术英语

Diagrammatical Professional English of
Mould Technology

© 吴拓 编



机械工业出版社
CHINA MACHINE PRESS

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本书共分六个单元,包括模具加工常用机械装置、冲压模具、塑料成形模具、热加工模具、模具制造方法及设备、模具商务英语。本书内容丰富、实用性强,涉及模具的分类和作用、各种模具成形零件和装置、模具的结构设计、模具的加工工艺、模具的加工设备及工具等知识,提供了2000多个模具专业英语词汇。

本书可供从事模具设计与制造的工程技术人员及模具外贸人员学习和使用,也可供高等院校模具设计与制造专业的师生参考。

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前 言

preface

我国是一个模具需求大国，也是一个模具制造大国，然而我国的模具精密制造仍处于较低的水平。要使我国的模具制造适应模具行业快速发展的需要，就必须吸收国际先进的模具设计与制造技术，这就要求模具技术人员具有较高的英语水平。

英语不仅是开展国际交流的重要工具，也是科技信息的重要载体。随着我国科学技术的高度发展和全球经济一体化的快速形成，越来越多的企业对工程技术人员的专业外语水平提出了较高的要求。专业科技英语对于专业技术人员和理工科大学生的的重要性是不言而喻的。

为了帮助从事模具设计与制造的工程技术人员和模具设计与制造专业的学生提高直接阅读科技英语原文和翻译模具专业英语资料的能力，学习和借鉴国外先进的模具设计和制造技术，特别是模具 CAD/CAM 等应用软件，能够用英语撰写模具专业科技论文和模具产品贸易文件，提高工程技术人员进行国际交流和开展国际业务的能力，从而大力推进我国模具制造工业的快速发展，特编写本书。

本书在编写过程中，主要遵循以下原则：

1. 适应专业，契合技术。本书全面、系统、完整地按模具类别划分单元结构，精选设计图样，适应各类模具工艺的需要。它既是一本英语学习用书，也是一本可供模具技术人员参考的技术手册。

2. 便于学习，着眼应用。本书的读者对象为具有一定英语基础的模具设计与制造技术人员或大中专院校模具专业的学生，为便于学习，采取英汉对照的形式，突出与模具紧密相关的内容。书中所用图样均为实际加工图，有利于丰富模具方面的知识和技能。

3. 图文并茂，双色印刷。本书以从事模具设计与制造的技术人员所熟知的图样为主导，直观、形象、具体地做出英语标示，做到图有所示，词有所指，图词对应，看图识词，伴有解说，帮助理解和记忆。双色印刷方便阅读，并用颜色标示出首次出现的词汇，方便学习。

4. 倚重模具，贯通其他。本书虽然名为模具技术英语，以模具设计与制造为主，但也适用于机械制造；虽然是为学习专业英语而作，但也对学习模具设计与制造的知识有一定帮助，可达到“一石二鸟”的效果。

5. 检索方便，学用结合。本书配有英文索引和中文索引，便于查询。

本书在编写过程中，得到了各位同仁的支持和帮助，熊锡源博士为本书的关键内容做了校改，在此一并表示衷心的感谢！

由于编者水平有限，书中难免有疏漏和欠妥之处，恳请各位专家和读者不吝指正。

编 者

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Unit 1 Frequently-Used Mechanical Equipment for Machining Moulds 模具加工常用机械装置

1.1 Common Mechanical Parts of Moulds 模具通用机械零部件

1.1.1 Fasteners and Joints 紧固件及连接件

1. Bolt connection 螺栓连接

When a bolt is passed through the hole in fitting and a suitable nut is used to tighten the bolt and the fitting, it is called bolt connection. 用螺栓穿过被连接件上的通孔，再用相配的螺母拧紧，将被连接件连接起来称为螺栓连接。

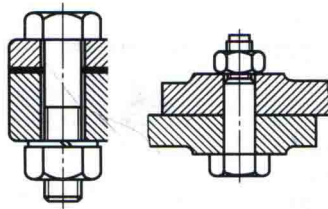


Fig. 1-1 Bolt connection 螺栓连接

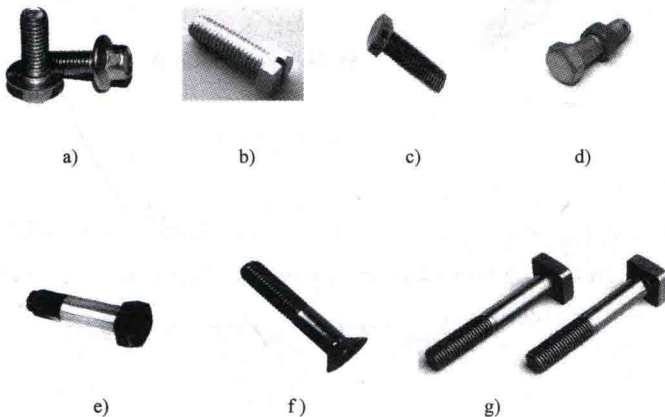


Fig. 1-2 Common bolts 常用螺栓

- a) Hexagon headed bolt 六角头螺栓
- b) Hexagon headed bolt with groove in head 六角头头部带槽螺栓
- c) Hexagon headed bolt with hole in head 六角头头部带孔螺栓
- d) Hexagon headed bolt with hole in screw 六角头螺杆带孔螺栓
- e) Hexagon headed bolt used for reamer hole 六角头铰制孔用螺栓
- f) Countersunk head bolt 沉头螺栓
- g) Square head bolt 方头螺栓



Fig. 1-3 Special use bolts 特殊用途螺栓

- a) Bolt used for T-shape groove T形槽用螺栓
- b) Swing bolt 活节螺栓
- c) Foundation bolt 地脚螺栓
- d) Stud bolt 双头螺柱
- e) High-strength bolt 高强度螺栓
- f) Weld bolt 焊接螺栓

2. Screw joints 螺钉连接

Screw connection refers to the connection of fitting by screwing a bolt into the blind holes in the fitting. 螺钉连接是用螺栓直接拧入被连接件盲孔内实现的连接。

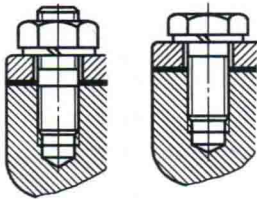


Fig. 1-4 Screw joints 螺钉连接

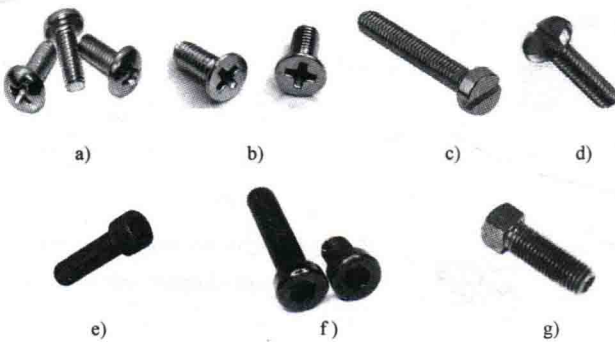


Fig. 1-5 Screws 螺钉

- a) Cross pan head screw 十字盘头螺钉
- b) Cross slot sunk screw 十字槽沉头螺钉
- c) Slotted cheese-head screw 开槽圆柱头螺钉
- d) Slotted pan head screw 开槽盘头螺钉
- e) Hexagon socket cap head screw 内六角圆柱头螺钉
- f) Hexagon socket flat head screw 内六角平头螺钉
- g) Square head screw 方头螺钉

3. Fastening joints 紧定螺钉连接

Set screw connection refers to the connection of two parts with one end of a bolt screwed into the screw thread hole of one part and the other end of the bolt fit in the pit of the other part, thus fixing the relative position of the two parts, and transferring a small torque. 紧定螺钉连接是利用拧入一个零件螺纹孔中的螺钉的末端顶住另一零件的表面或顶入相适应的凹坑中，以固定两个零件的相对位置，并可传递不大的转矩。

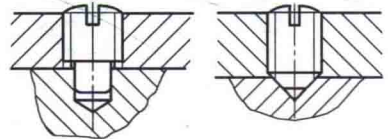


Fig. 1-6 Fastening joints 紧定螺钉连接

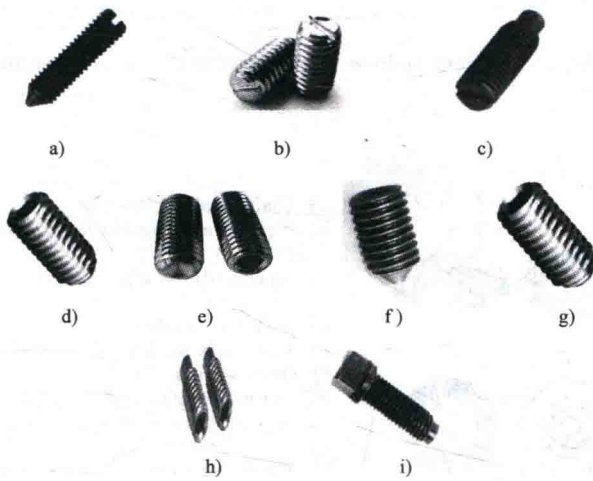


Fig. 1-7 Set screws 紧定螺钉

- a) Slotted set screw with cone point
开槽锥端紧定螺钉
- b) Slotted set screw with flat point
开槽平端紧定螺钉
- c) Slotted set screw with cylindrical end
开槽长圆柱端紧定螺钉
- d) Slotted set screw with recessed terminus
开槽凹端紧定螺钉
- e) Hexagon socket set screw with flat end
内六角平端紧定螺钉
- f) Hexagon socket set screw with cone point
内六角锥端紧定螺钉
- g) Hexagon socket set screw with cup point
内六角凹端紧定螺钉
- h) Hexagon socket set screw with cylindrical end
内六角圆柱端紧定螺钉
- i) Square head set screw
方头紧定螺钉

4. Other use screws 其他用途螺钉



Fig. 1-8 Other use screws 其他用途螺钉

- a) Positioning screw
定位螺钉
- b) Un-dropout screw
不脱出螺钉
- c) Self-tapping screw
自攻螺钉
- d) Milled screw
滚花螺钉
- e) Lifting screw
吊环螺钉

5. Nuts 螺母

Vulgarity of nut is screw cap, and it is the mountings of bolt. 螺母俗称螺帽，为螺栓的配件。

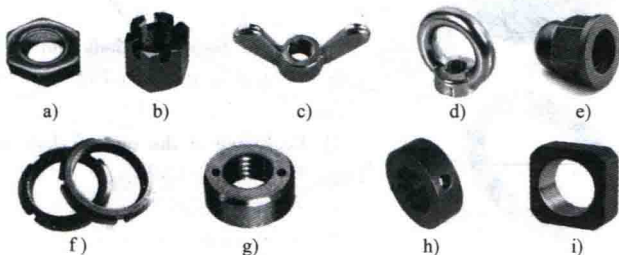


Fig. 1-9 Nuts 螺母

- a) Hexagon nut
六角螺母
- b) Hexagon slotted nut
六角开槽螺母
- c) Butterfly nut
蝶形螺母
- d) Ring nut
环形螺母
- e) Bonneted nut
盖形螺母
- f) Circular nut
圆形螺母
- g) Round nut with holes in end face
端面带孔圆螺母
- h) Round nut with holes in side
侧面带孔圆螺母
- i) Square nut
方螺母

6. Washers 垫圈

Washer pads between the nut and fittings, so as to reduce the pressure of the contact point, avoid tighten nut scratching fitting surface. 垫圈垫在螺母和被连接件之间，以减少接触处的压强，避免拧紧螺母时划伤安装表面。

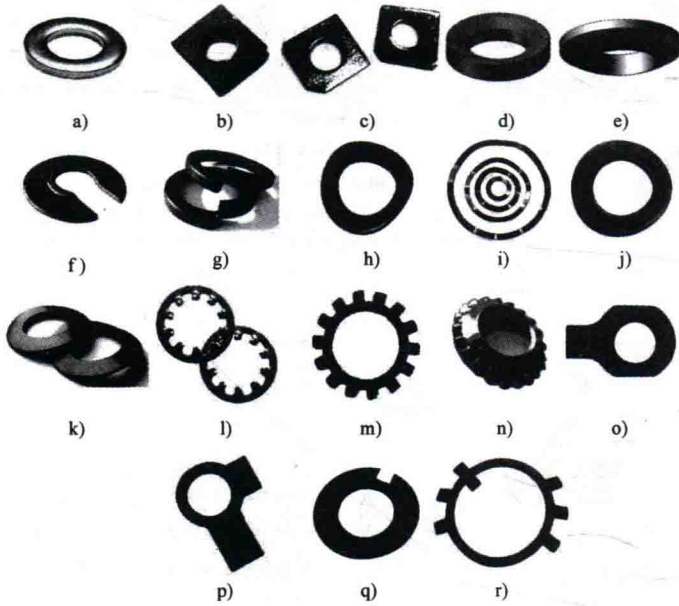


Fig. 1-10 Washers 垫圈

- a) Plain washer 平垫圈
- b) Square taper washer for 工字钢用方斜垫圈
- c) Square taper washer for slot section 槽钢用方斜垫圈
- d) Ball face washer 球面垫圈
- e) Cone face washer 锥面垫圈
- f) Open washer 开口垫圈
- g) Spring washer 弹簧垫圈
- h) Wave spring washer 波形弹性垫圈
- i) Wave single coil spring lock washer 波形弹簧垫圈
- j) Curved spring washer 鞍形弹性垫圈
- k) Saddle spring washer 鞍形弹簧垫圈
- l) Internal teeth lock washer 内齿锁紧垫圈
- m) External teeth lock washer 外齿锁紧垫圈
- n) Cone lock washer 锥形锁紧垫圈
- o) Single ear anti-motion washer 单耳止动垫圈
- p) Double ears anti-motion washer 双耳止动垫圈
- q) External-tab anti-motion washer 外舌止动垫圈
- r) Anti-motion washer for round nut 圆螺母用止动垫圈

7. Check rings 挡圈

The check ring is a separable gasket. 挡圈是可分离的垫圈。

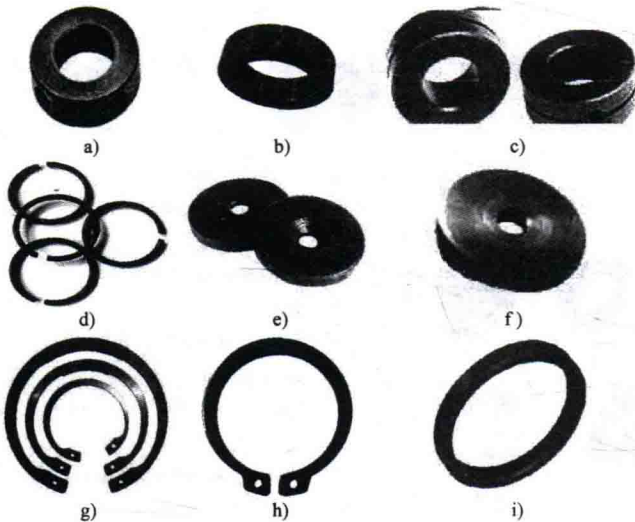


Fig. 1-11 Check rings 挡圈

- a) Lock ring with cone pin 锥销锁紧挡圈
- b) Lock ring with screw 螺钉锁紧挡圈
- c) Lock ring with screw and circlip 带锁圈的螺钉锁紧挡圈
- d) Steel cable baffle ring 钢丝挡圈
- e) Screw fastening shaft end baffle ring, Lock ring at the end of shaft with screw 轴端螺钉锁紧挡圈
- f) Lock ring at the end of shaft with bolt 轴端螺栓锁紧挡圈
- g) Circlip for hole 孔用弹性挡圈
- h) Circlip for shaft 轴用弹性挡圈
- i) Ring for shoulder 轴肩挡圈

8. Riveted joints 铆钉连接

Riveted joint is a mechanical connection that connects two pieces of laped plate by rivet.

铆接是一种通过铆钉将两块搭接的板连接起来的机械连接。

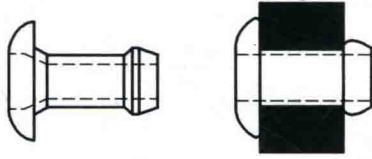


Fig. 1-12 Riveted joints 铆钉连接

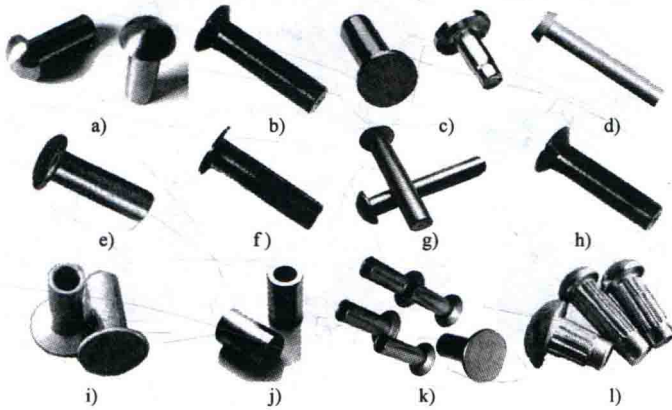


Fig. 1-13 Rivets 铆钉

- a) Half-round head rivet 半圆头铆钉
- b) Countersunk head rivet 沉头铆钉
- c) Flat head rivet, Flush head rivet 平头铆钉
- d) Cone head rivet 平锥头铆钉
- e) Oval countersunk head rivet 半沉头铆钉
- f) Thin flat head rivet 扁平头铆钉
- g) Truss head rivet 扁圆头铆钉
- h) 120 degree countersunk head rivet 120°沉头铆钉
- i) Countersunk head semi-tubular rivet 沉头半空心铆钉
- j) Hollow rivet 空心铆钉
- k) Pipe type rivet 管状铆钉
- l) Rivet for rame plate 标牌铆钉

9. Pins 销

Pin is mainly used for the relative position between the fixed part. Pin can also be used to connect to, passing a small load, also can be used as the overload safety device components. 销主要用来固定零件之间的相对位置。销也可用于连接，传递不大的载荷，还可作为安全装置中的过载元件。

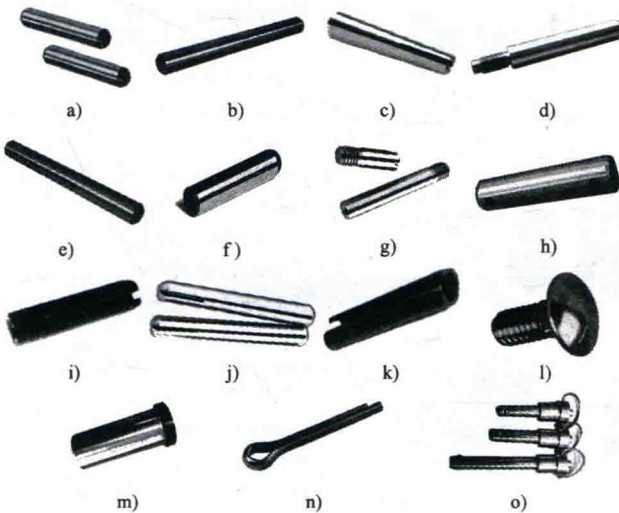


Fig. 1-14 Pins 销

- a) Taper pin 圆锥销
- b) Taper pin with internal thread 内螺纹圆锥销
- c) Split conical cotter pin 开尾圆锥销
- d) Screw end conical pin 螺尾圆锥销
- e) Cylindrical pin, Straight pin 圆柱销
- f) Parallel pin with internal thread 内螺纹圆柱销
- g) Parallel pin with external thread 外螺纹圆柱销
- h) Pin with holes 带孔销
- i) Elastic cylindrical pin 弹性圆柱销
- j) Parallel grooved pin 平行沟槽销
- k) Taper grooved pin 锥槽销
- l) Fillicter head pin 圆头销
- m) Hinge pin 销轴
- n) Split pin 开口销
- o) Safety pin 安全销

10. Keys 键

Keys are usually used to implement the circumferential fixation between shaft and hub to transmit torque or movement, some still can realize shaft parts of axial fixed or axial sliding guide. The shaft and wheel around to uniform multiple teeth called a spline. 键常用来实现轴与轮毂间的周向固定以传递转矩或运动，有的还能实现轴上零件的轴向固定或轴向滑动的导向。轴或轮毂孔周向均布多个键齿者称为花键。

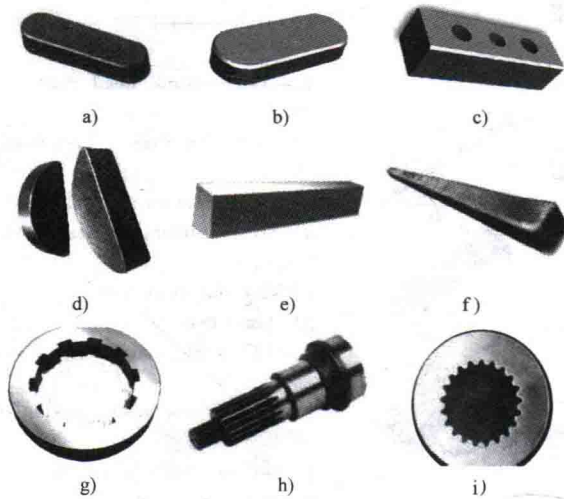


Fig. 1-15 Keys 键

- a) Flat key 普通平键
- b) Thin key 薄型平键
- c) Feather key, Dive key 导向平键
- d) Woodruff key 半圆键 (半月键)
- e) Taper key 楔键
- f) Tangent key 切向键
- g) Rectangle spline 矩形花键
- h) Involute spline 渐开线花键
- i) Triangle spline 三角形花键

1.1.2 Springs 弹簧

Spring is a kind of mechanical parts use flexibility to work. Usually it made from spring steel. 弹簧是一种利用弹性来工作的机械零件。一般用弹簧钢制成。



Fig. 1-16 Springs 弹簧

- a) Compression spring 压缩弹簧
- b) Stretch spring 拉伸弹簧
- c) Torsion spring 扭转弹簧
- d) Conical coil spring 圆锥形螺旋弹簧
- e) Disc spring 碟形弹簧
- f) Plate spring 板弹簧
- g) Diaphragm spring 膜片弹簧
- h) Torsion bar spring 扭杆弹簧
- i) Capsule-type air spring 囊式空气弹簧
- j) Free membrane air spring 自由膜式空气弹簧
- k) Hydro-pneumatic spring 液气弹簧
- l) Ring spring 环形弹簧
- m) Rubber spring 橡胶弹簧
- n) Clockwork spring 发条弹簧

1.1.3 Operating Parts 操作件

Operating part is a part used for realizing some movement. 操作件是指用来实现某种动作的元件。

操作件是指用来实现某种动作的元件。



- a) Small turning handle 小转动手柄
- b) Turning handle 转动手柄
- c) Ball handle 球头手柄
- d) Positioning handle 定位手柄
- e) Small ripple handwheel 小波纹手轮
- f) Small handwheel 小手轮
- g) Ripple handwheel 波纹手轮
- h) Handwheel 手轮
- i) Handle 把手

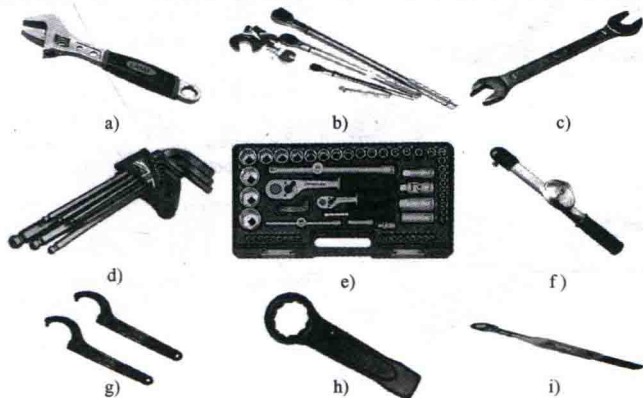
Fig. 1-17 Operating Parts 操作件

1.2 Machining Tools of Moulds 模具加工工具

1.2.1 Common Tools of Mould Fitters 模具钳工通用工具

1. Hand tools 手工工具

Hand tools, with the hand grip, to the human manpower or to the control of other power acts on the object of small tools, used for manual cutting and auxiliary decoration, are usually with a handle, easy to carry. 手工工具是一种依靠人力或其他工具作用在物体上的小型工具。它用手握持，用于手工切削和辅助修正，通常带有手柄，便于携带。



- a) Adjustable spanner 活扳手
- b) Fixed torque spanner 定力矩扳手
- c) Open spanner 呆扳手
- d) Internal hexagonal wrench 内六角扳手
- e) (Complete set) Socket spanner (成套) 套筒扳手
- f) Torque wrench 扭力扳手
- g) Locking spanner 锁紧扳手
- h) Entirety box spanner 整体梅花扳手
- i) Digital readout measuring torque spanner 数显测力矩扳手

Fig. 1-18 Spanners 扳手

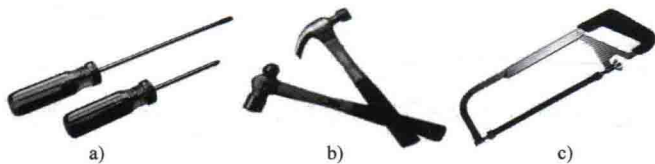


Fig. 1-19 Manual operation tools 手动工具

- a) Standard screwdriver 标准螺钉旋具
- b) Arm hammer 锤子
- c) Arm saw 手锯

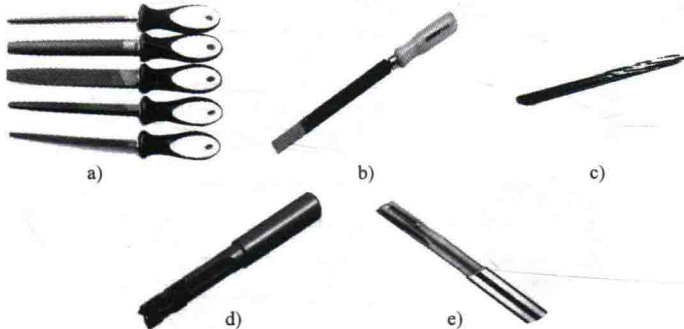


Fig. 1-20 Hand cutters 手工刀具

- a) File 锉刀
- b) Flat scraper 平面刮刀
- c) Spiral groove hand reamer 螺旋槽手动铰刀
- d) Entirety cylindrical reamer 整体式圆柱铰刀
- e) Cemented carbide chucking reamer 硬质合金机用铰刀

2. Marking tools 划线工具

Marking tools are mainly used for marking in machining process, it is widely used in single or small batch production. The basic requirement of marking is seaborne line clean, the size of finalize the design and positioning is accurate. Because marking lines have a certain width, the general requirement of precision is 0.25-0.5 mm. 划线工具主要用于机械加工中的划线工序, 广泛用于单件或小批量生产之中。对划线的基本要求是线条清晰匀称, 定型、定位尺寸准确。由于划线的线条有一定的宽度, 一般要求精度达到 0.25~0.5mm。

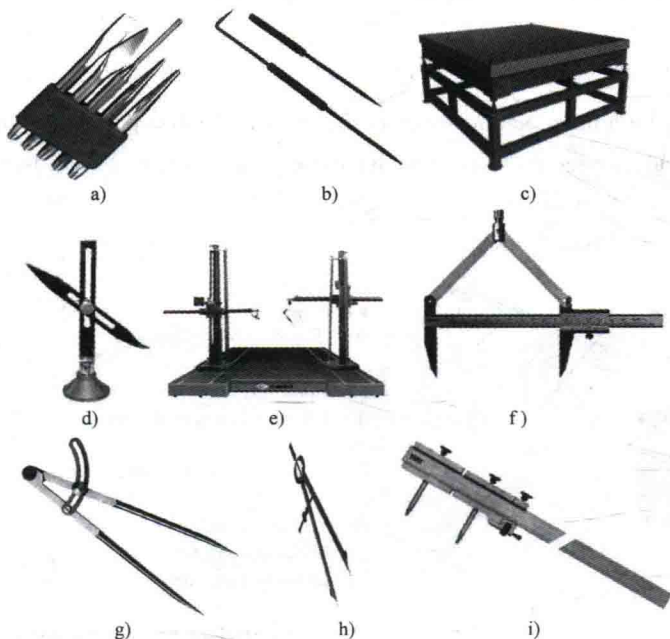


Fig. 1-21 Marking tools 划线工具

- a) Anvil 样冲
- b) Scratch awl 划针
- c) Lineation surface plate 划线平板
- d) Lineation dish 划针盘
- e) Three-dimensional lineation 立体划线
- f) Vernier lineation compass 游标划线圆规
- g) Scribing compass 划规
- h) Spring scribing compass 弹簧划规
- i) Slide bar scribing compass 滑杆划规

3. Checkout tools 校验工具

Checkout tools mostly are flat feet. Flat feet should adopt high quality close gray cast iron or alloy cast iron materials, such as its surface hardness should be 170-220HBW. 校验工具主要是平尺。平尺应采用优质细密的灰铸铁或合金铸铁等材料制造, 其工作面硬度应为170~220HBW。

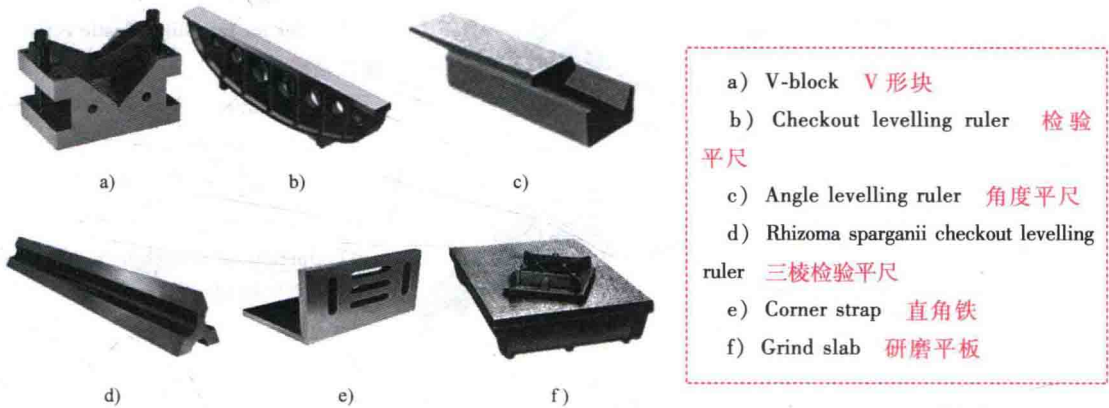


Fig. 1-22 Checkout tools 校验工具

1.2.2 Dedicated Tools of Mould Fitters 模具钳工专用工具

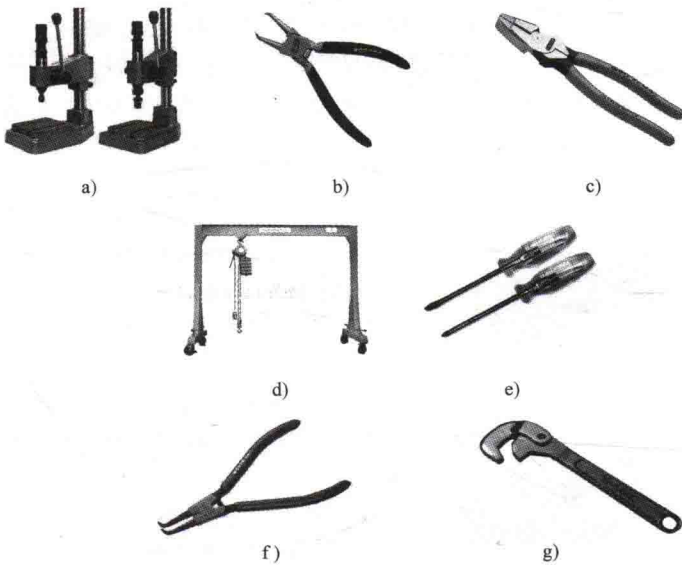
1. Dismantling tools 拆卸工具

Dedicated tools of mould fitter refers to tools used in the mold disassembly and assembly by mould fitter. The disassembly tool is divided into two major categories of pull unloading and draw unloading. 模具钳工专用工具是指模具钳工拆卸和装配模具所用的工具。拆卸工具又分为拔卸类和拉卸类两大类。



Fig. 1-23 Dismantling tools 拆卸工具

2. Assembling tools 装配工具



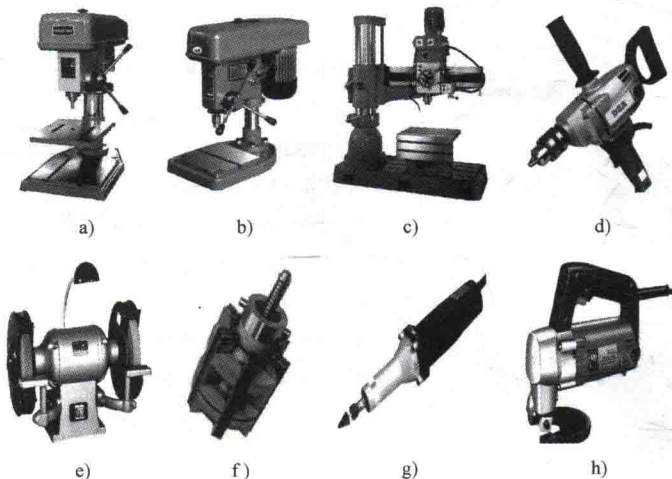
- a) Hand press 手动压床
- b) Plier for installing elastic collar
弹性挡圈安装钳
- c) Wire-cutter 钢丝钳
- d) Gallows frame 龙门吊架
- e) Spin tool for bolt 螺钉旋具
- f) Gripping tongs 鸭嘴钳
- g) Operational wrench by mould fitter
模具钳工使用的扳手

Fig. 1-24 Assembling tools 装配工具

1.3 Common Equipment of Mould Fitters 模具钳工常用设备

1.3.1 Common Machining Equipment of Mould Fitters 模具钳工常用加工设备

Common machining equipment of mould fitter mainly includes the drilling equipment, grinding equipment, machining equipment and pneumatic equipment. 模具钳工常用加工设备主要包括钻削设备、磨削设备等切削加工设备和风动设备。



- a) Vertical driller 立式钻床
- b) Bench drilling machine 台式钻床
- c) Radial drilling machine 摇臂钻床
- d) Electric hand drill 手电钻
- e) Grinding machine 砂轮机
- f) Honing head for big hole 大孔珩磨头
- g) Electric grinding head 电磨头
- h) Electric clippers 电剪刀

Fig. 1-25 Machining equipment 机加工设备