

15- ma'ruza. Metalkesish dastgohlari

§1. Parmalash va parmalash dastgohlari

§2. Frezalash va frezalash dastgohlari

§3. Randalash, ōyish, sidirish jarayonlari va dastgohlari

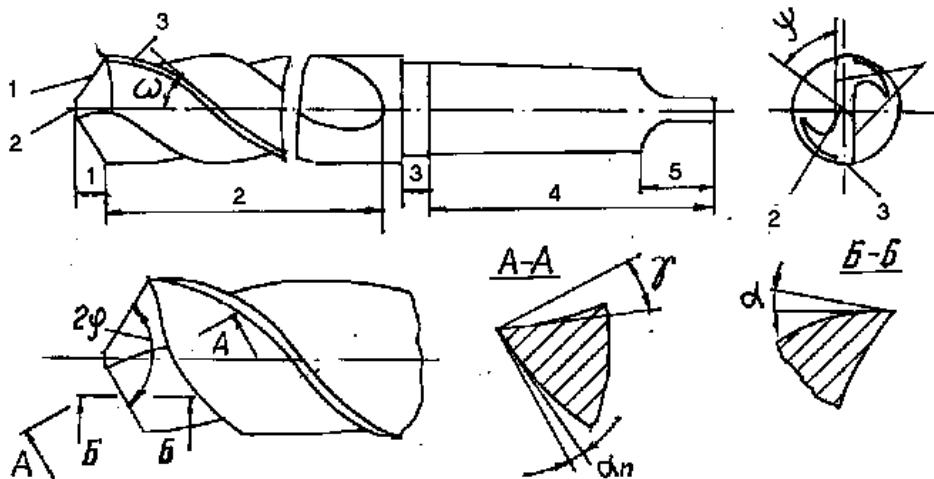
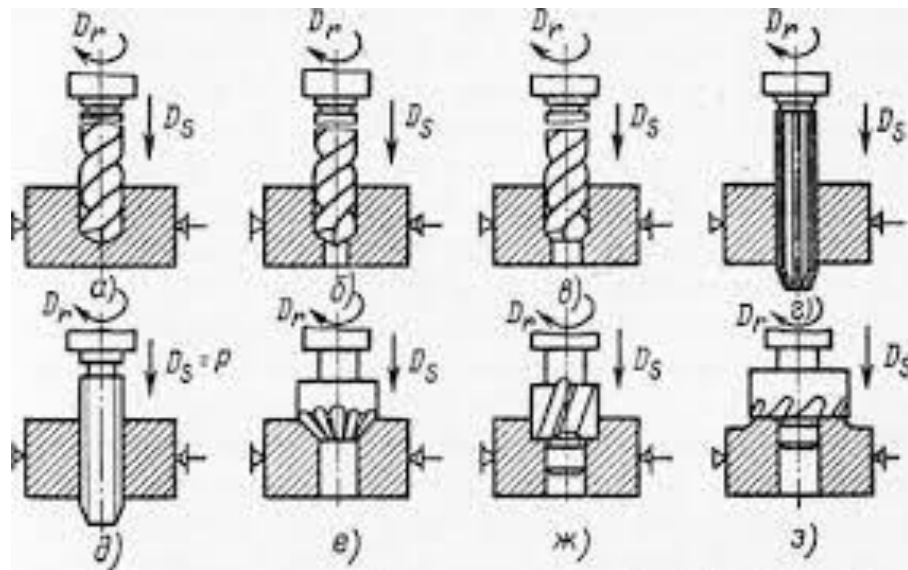
§4. Jilvirlash va jilvirlash dastgohlari

§5. Tishqirqish va tishqirqish dastgohlari

§1. Parmalash va parmalash dastgohlari

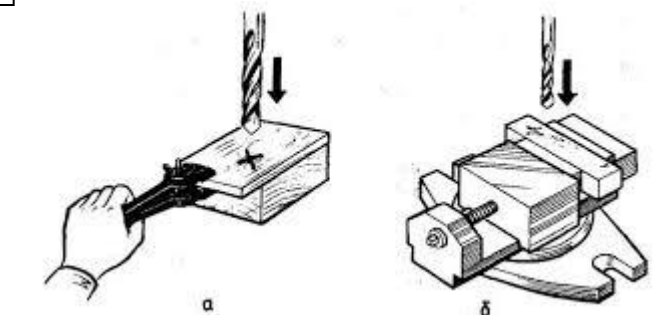
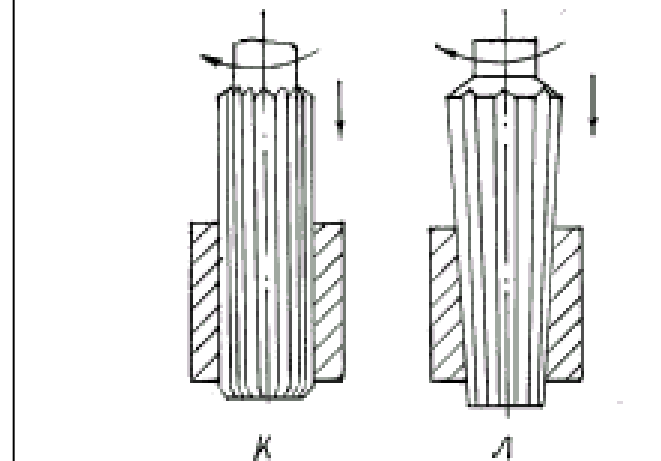
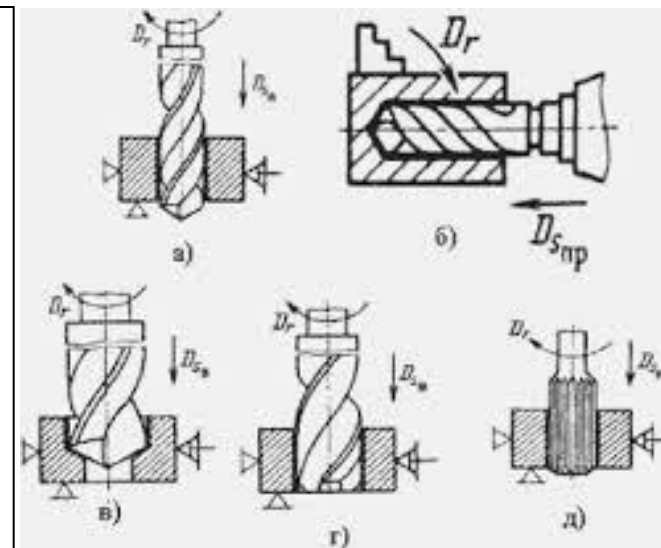
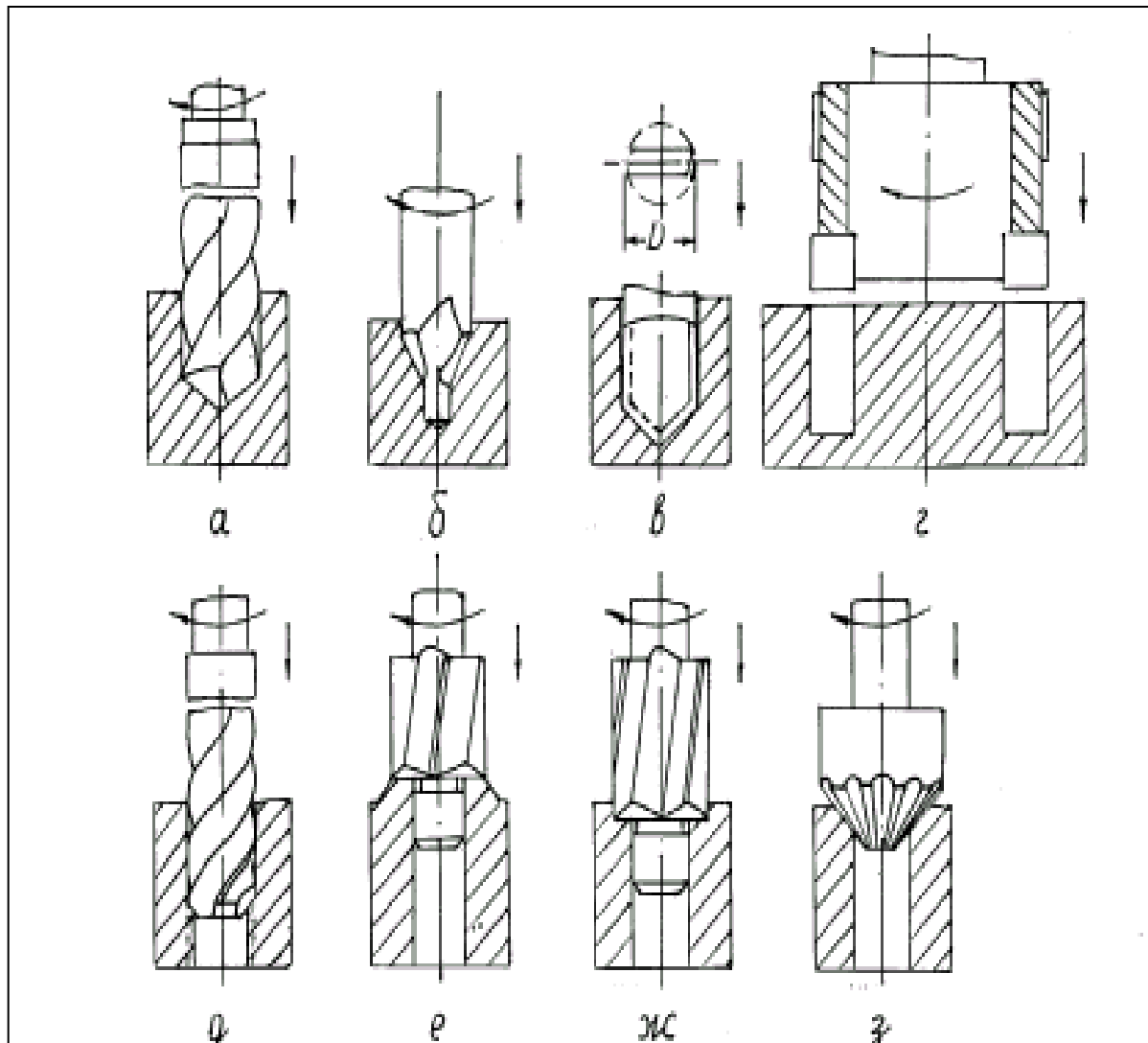
Parmalash – doiraviy teshiklarga dastlabki ishlov berishning asosiy usuli. Parmalash yōli bilan teshiklarni yaxlit materialda teshish yoki teshiklarni kengaytirish mumkin.

Parmalashda kesish harakati – parmaning aylanma harakati, surish harakati – parmaning ilgarilanma harakat. Ikkala harakat ham detalga yoki kesuvchi asbobga berilishi mumkin.



Spiralsimon parmaning qism va elementlari.

- 1 - kesish qismi;
- 2 - silliqlovchi qismi;
- 3 - bōyin;
- 4 - guyruq;
- 5 – panja.

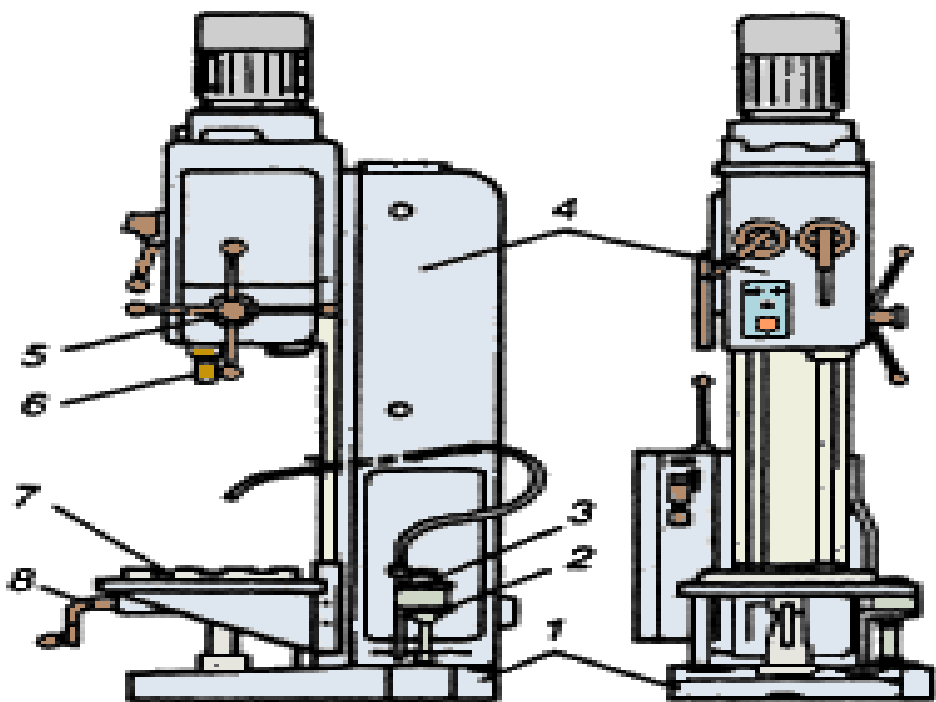


Parma, zenker va razvyortkalar turlari.

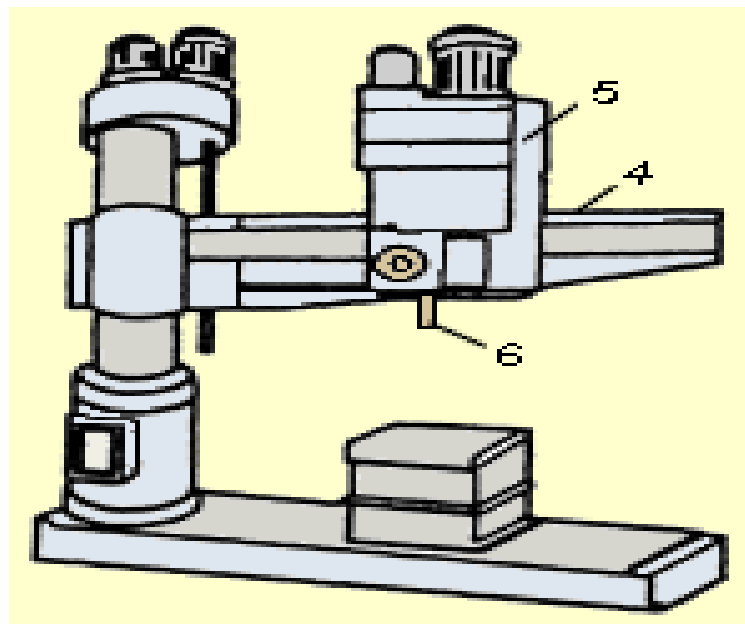
a – spiral tsilindrik parma; б - markazlash parma; в - patsimon parma; г- halqasimon parma; д – tsilindrik zenker; e,ж – tsekovkalar; з – zenkovka; k – tsilindrik razvyortka; л – konusli razvuortka

Parmalash guruhidagi dastgohlar teshiklarni parmalash, kehgaytirish, zenkerlash, yo'nib kengaytirish va razvertkalash uchun mo'ljallangan.

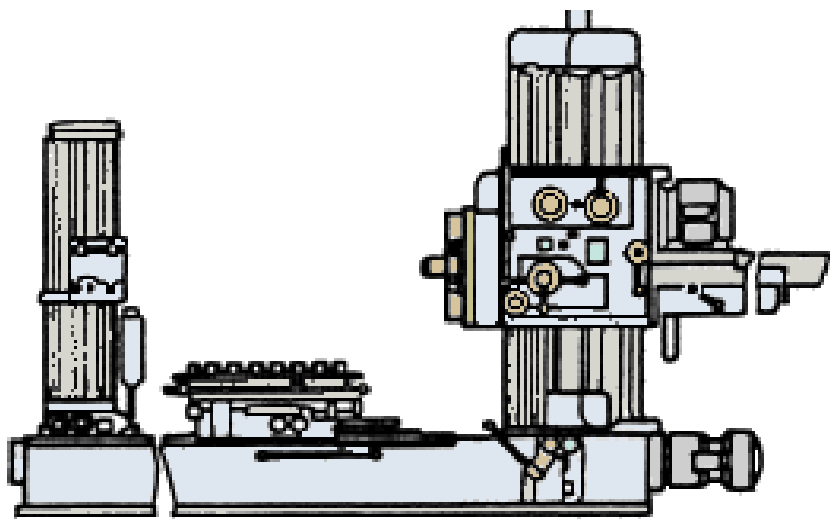
Bundan tashqari bu dastgohlarda keskichlar yordamida homakilarning yon tomonlari yo'niladi, yuza va ariqchalar frezalanadi rezba ochiladi.



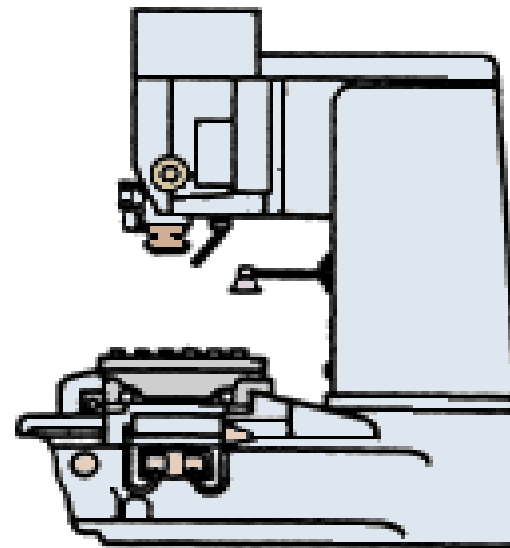
Vertikal parmalash dastgohi



Radial parmalash dastgohi



Gorizontalkoordinat-kengaytirish dasgohi

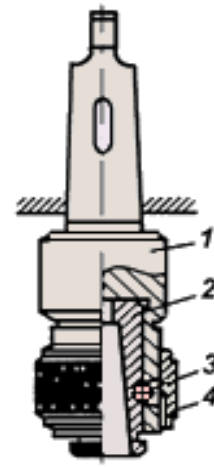
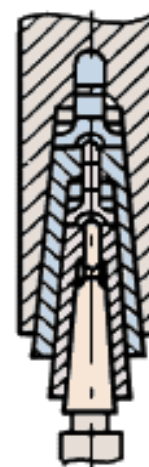
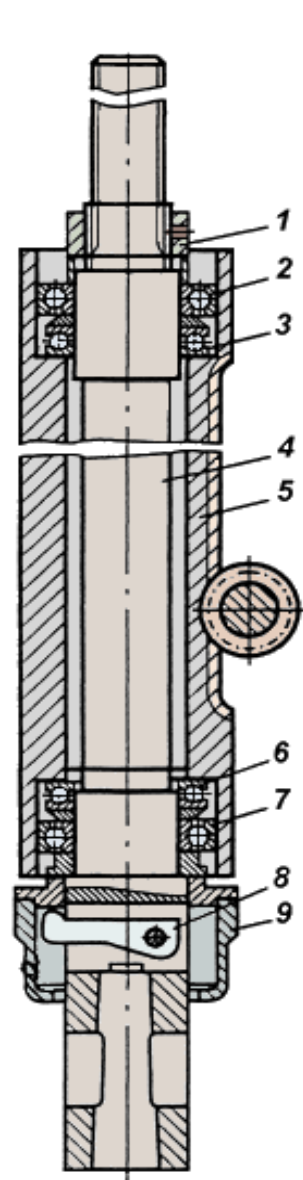
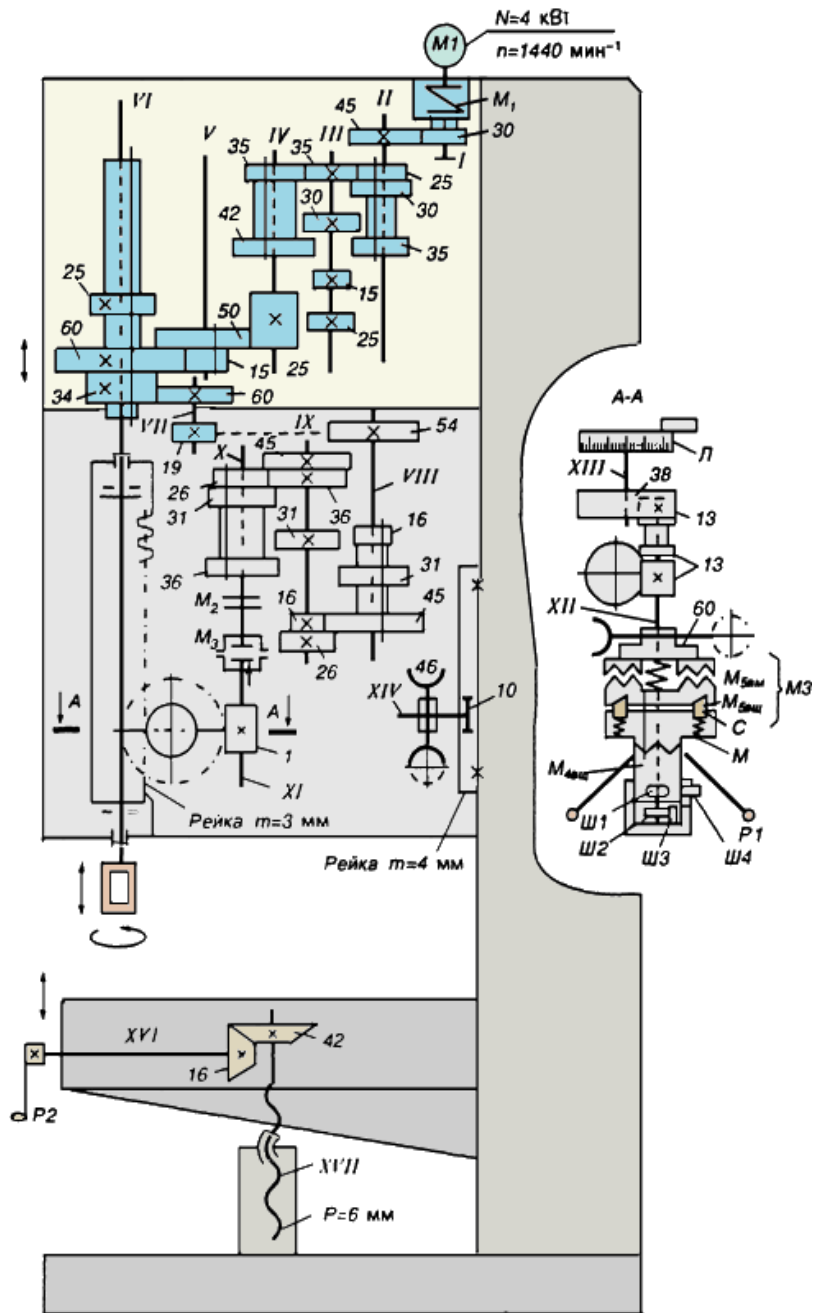


Koordinat-kengaytirish dasgohi



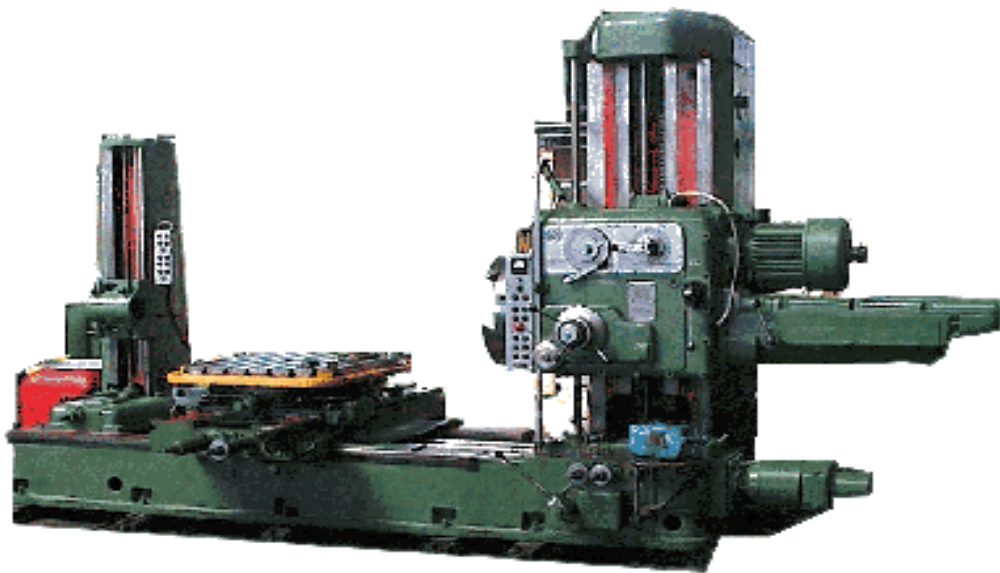
2H135 rusumli – vertikal-parmalash dasgohi.

- Parmaning eng katta diametri35 mm
- Shpindelning aylanishlar soni12
- Shpindelning aylanishlar tezligi .31,5...1400 ayl/min
- Shpindelning surishlar soni9
- Shpindelning surishlar tezligi 0,1...1,6 mm/ayl





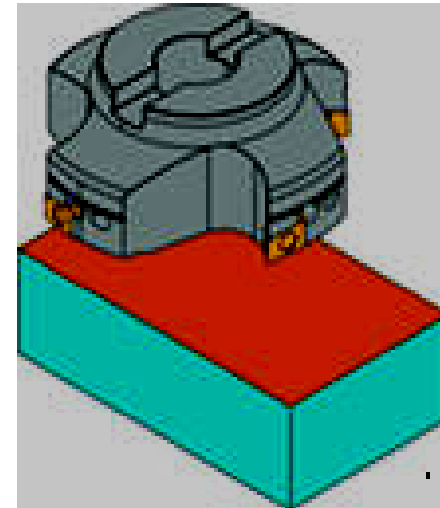
Radial parmash dastgohlari teshiklarni katta o'lchamli homakilarda teshish uchun mo'ljallangan, chunki shpindel kallagini aylanadigan traversa bo'ylab surish imkoniyati bor.



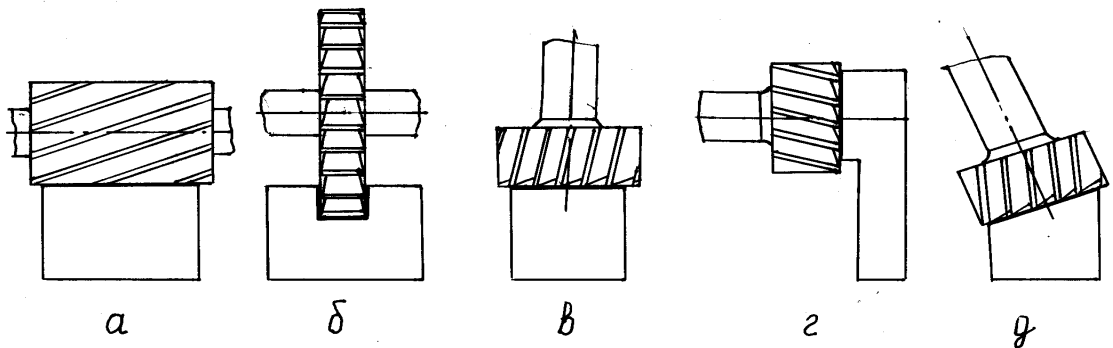
2620B rusumli universal gorizontzl-kengaytirish dastgohi yordamida quti shaklidagi detallarda teshiklar parmalanadi, kengaytiriladi, zenkerlanadi, tashqi va ichki rezbalar, har xil ariqchalar ochiladi.

§2. Frezalash va frezalash dastgohlari

Frezalash – yassi va fasonli yuzalarga kōp tishli kesuvchi asbob yordamida keng tarqalgan yukori unumli ishlov berish usuli. Frezaning har bir tishinikeskich deb kōrsa bōladi. Frezalashda kesish harakatni freza, surish harakatni stolga ōrnatilgan xomaki bajaradi.

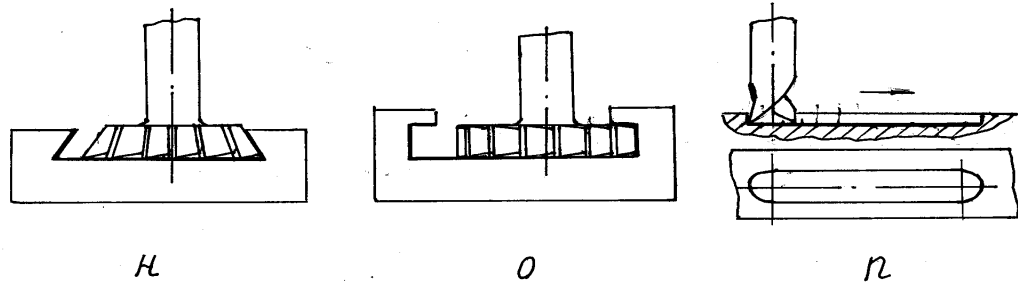
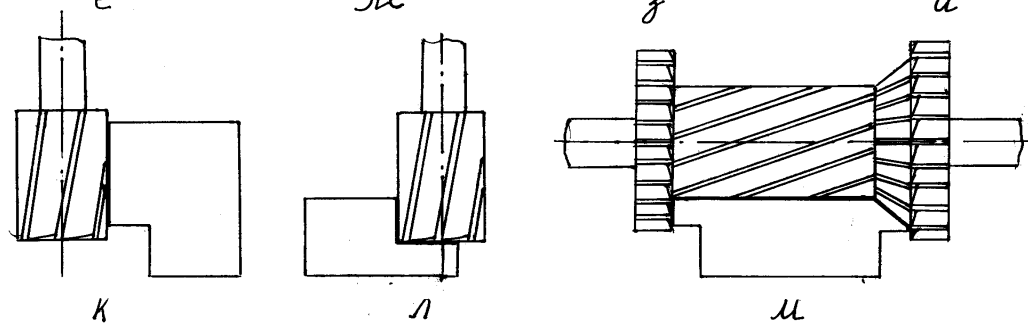
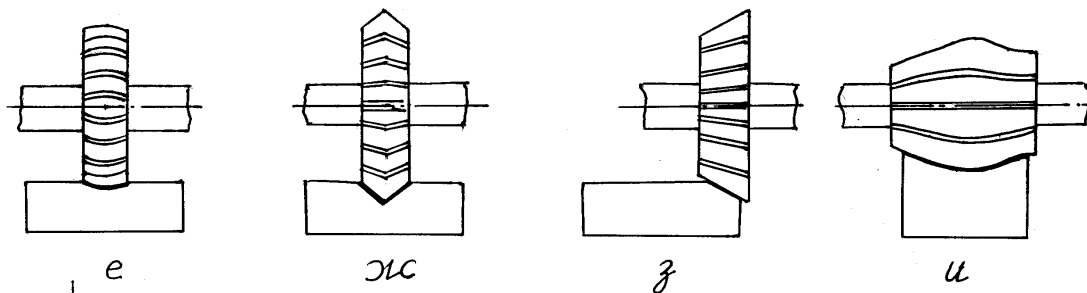


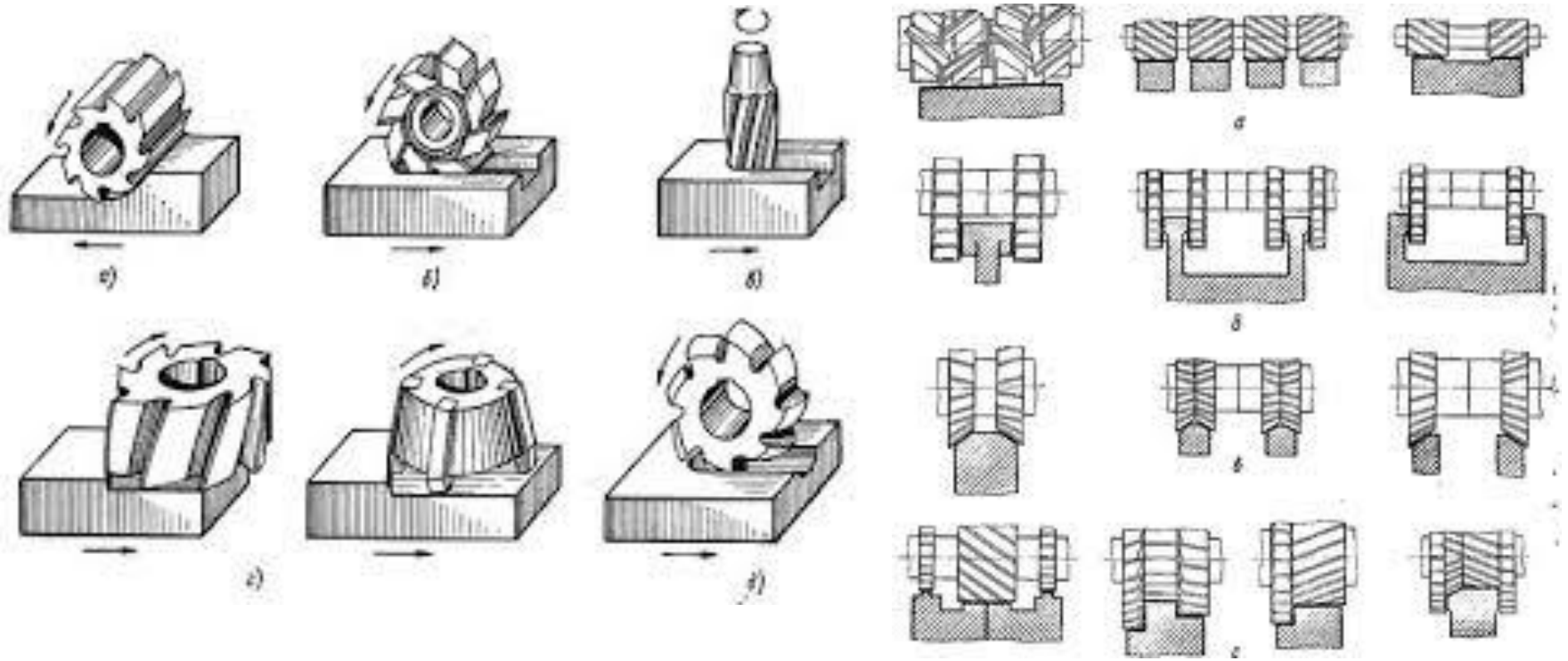
Frezalashning ikkita asosiy turi mavjud: silindrli va toretsli frezalash. Silindrli frezalashda frezaning ōki kesish jarayonida ishlanadigan yuzaga parallel bōlib, toretsli frezashda esa – tik bōlib harakatlanadi.

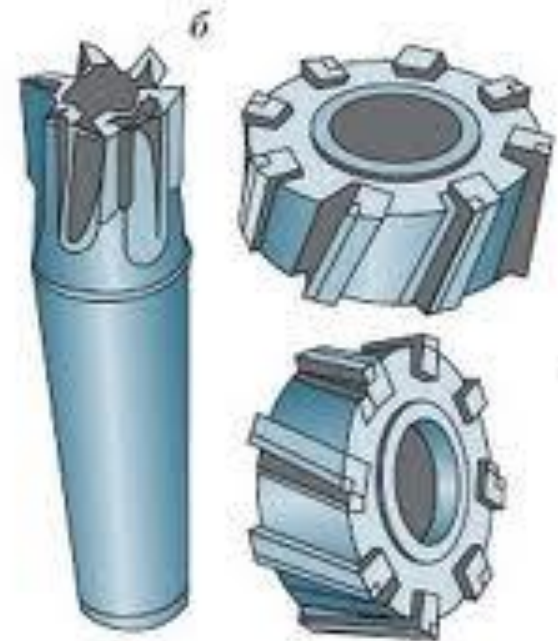
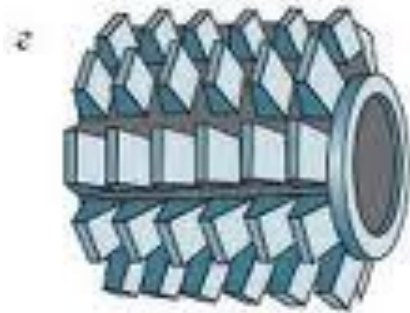
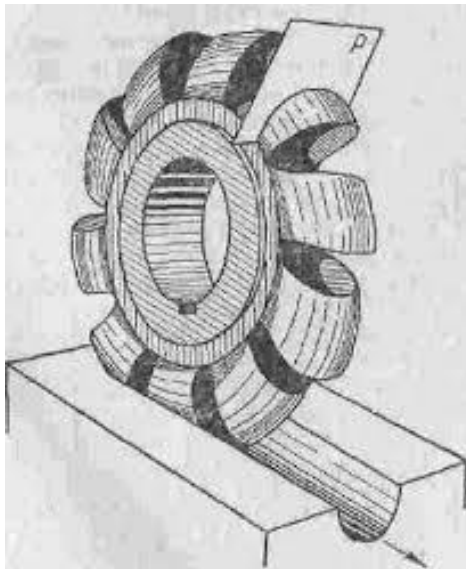


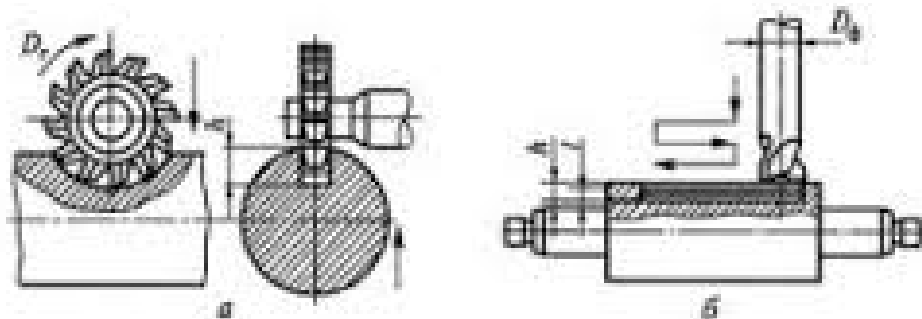
Frezalarning asosiy turlari

- a – tsilindrik freza;
- б– uch tomonli disk freza;
- в,г,д – torets frezalar;
- е, ж,з,и fasonli frezalar;
- к ,л – silindrik uch freza;
- м – frezalar komplekti;
- п – galdirgoch dumli freza;
- о – T simon freza;
- р- shlonka pazlarni o'yish freza;

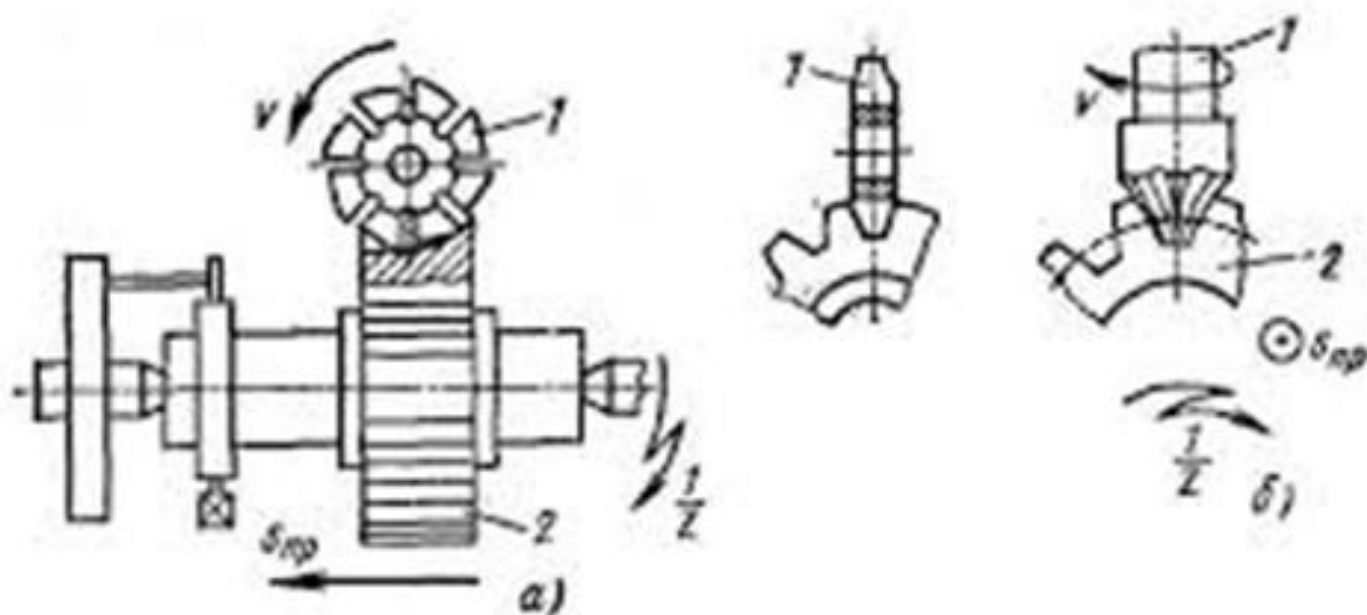








Shponkalar uchun ariqchalarni ochish
a) segmentli shponka uchun
b) prizmatik shponka uchun





Gorizontal frezalash dastgohlari



Vertikal frezlash dastgohlari

§3. Randalash, õyish, sidirish jarayonlari va dastgohlari

Randalash, õyish va sidirish dastgohlarda kesish harakati ilgarilanma harakat bõlib, u gorizontaal (randalash dastgohlari), vertikal (õyish dastgohlari) yoki gorizontaal ham, vertikal ham (sidirish dastgohlari) bõlishi mumkin.

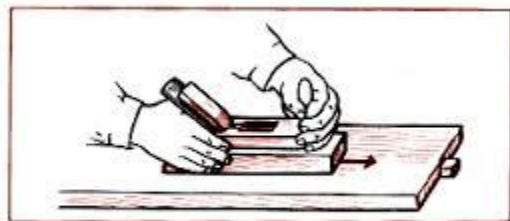
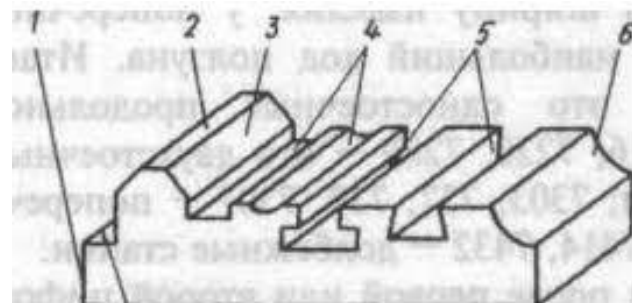
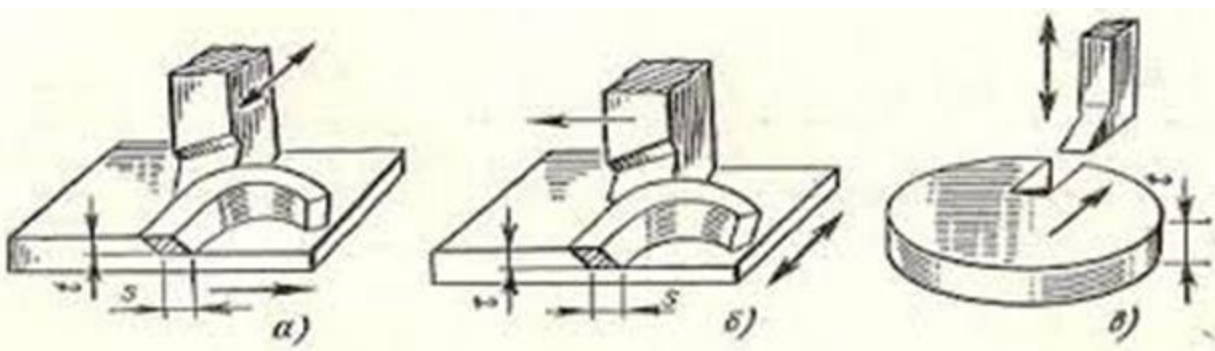
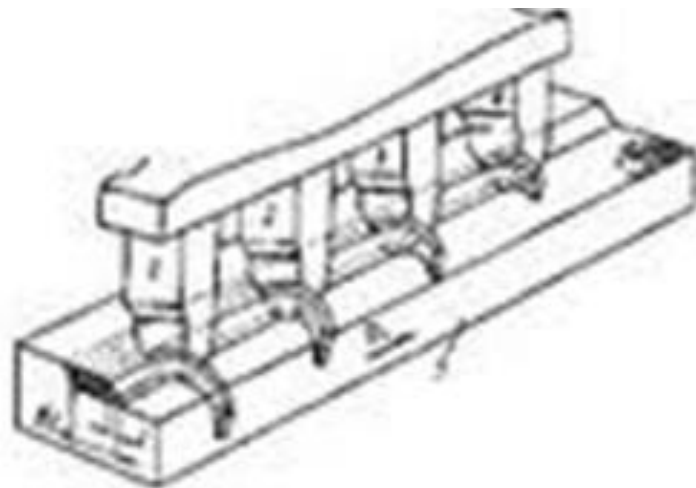
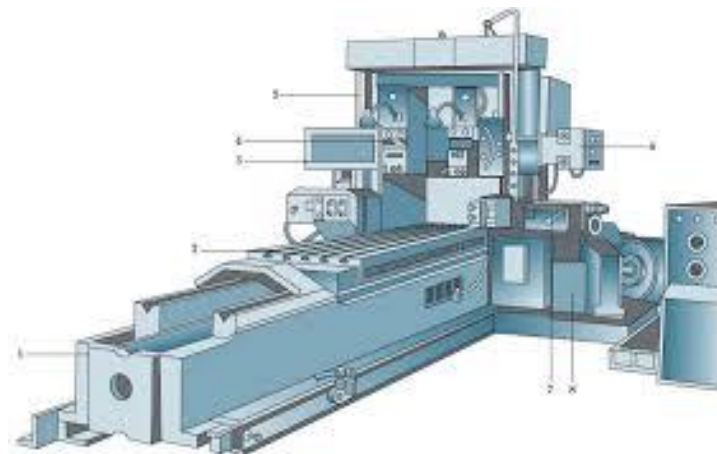


Рис. 32. Стругание рубанком

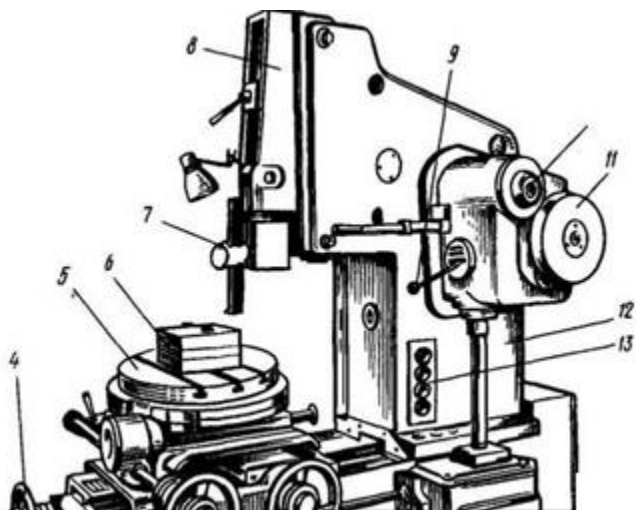




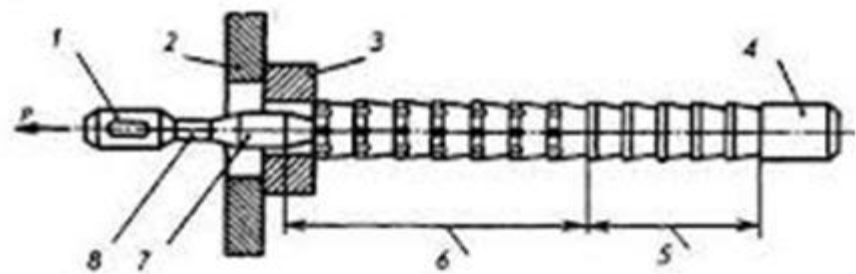
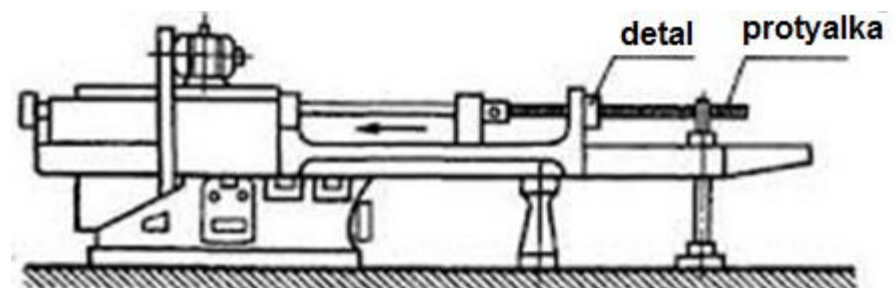
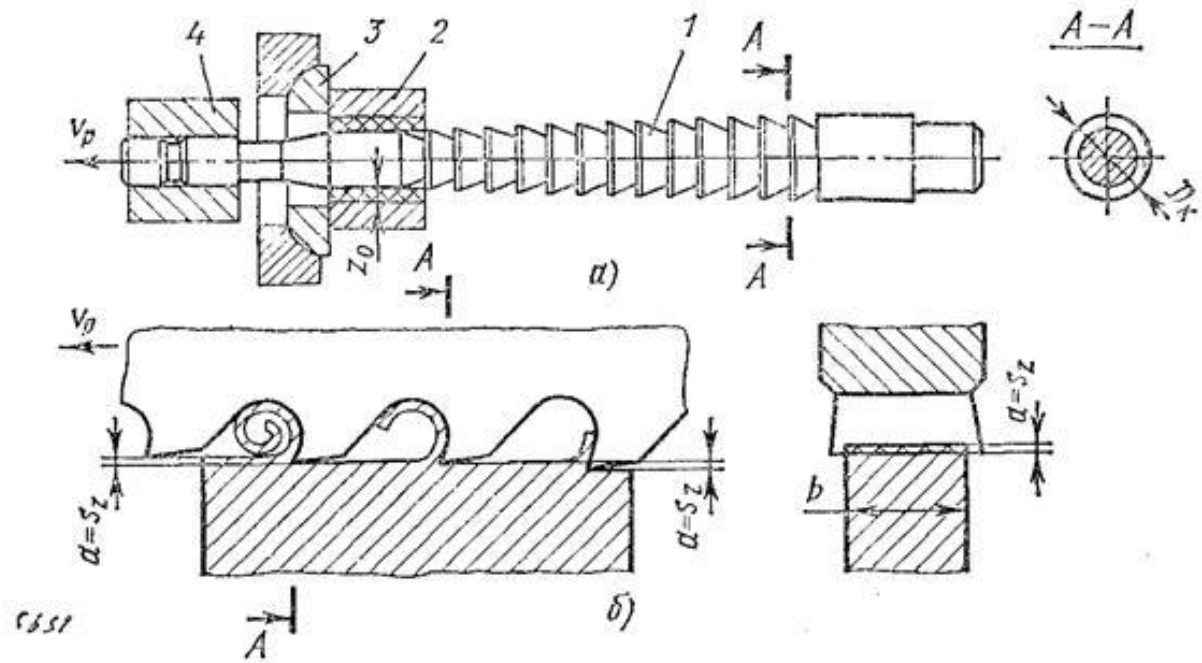
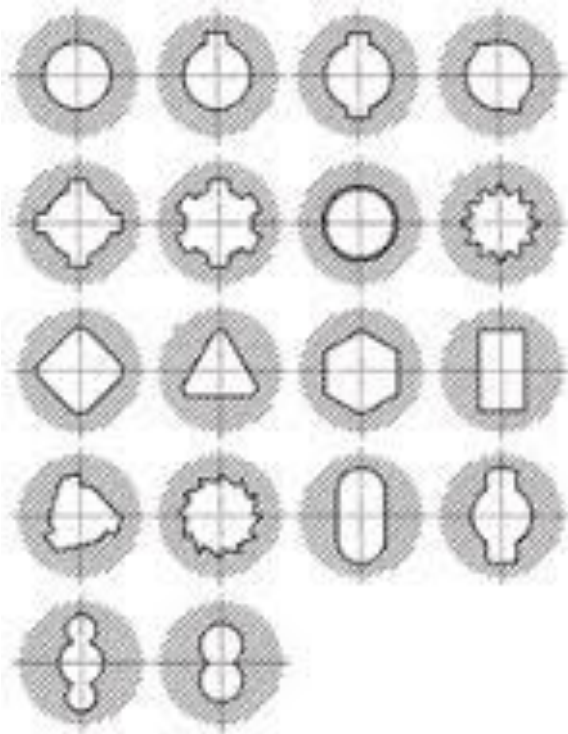
Ko'ndalang randalash dastgohi



Bo'ylama randalash dastgohi

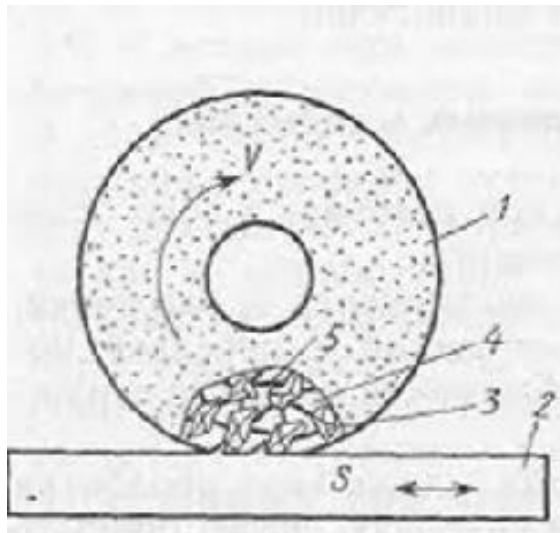


O'yish dastgohlari

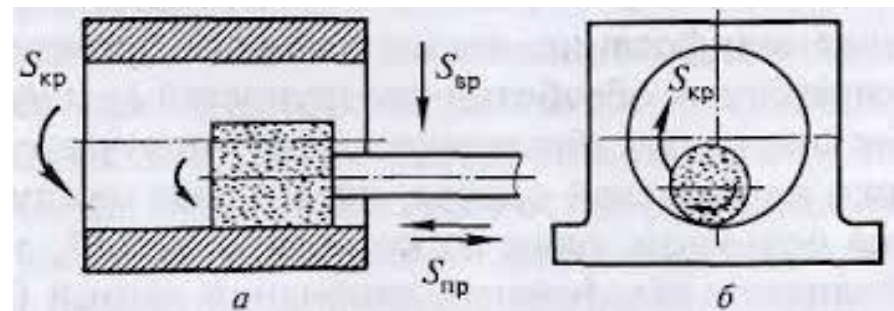
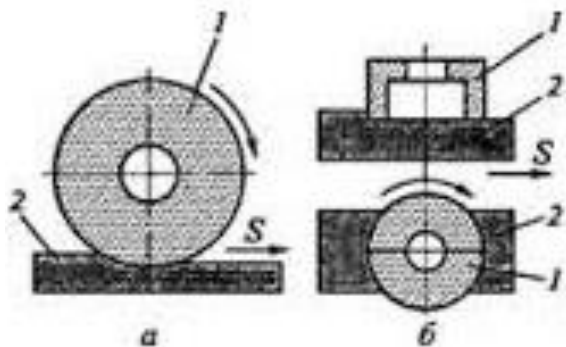
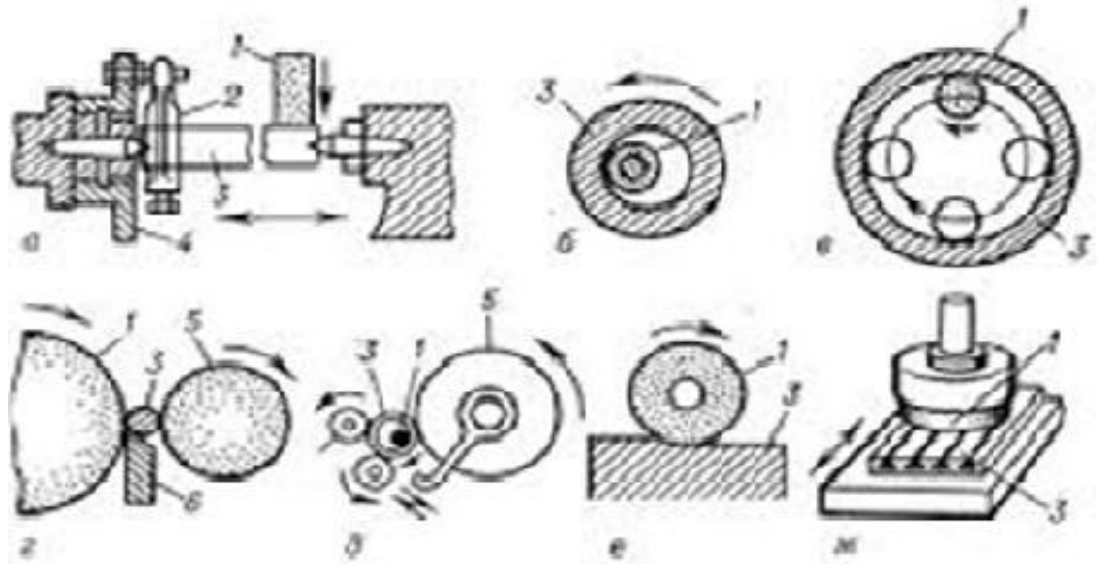


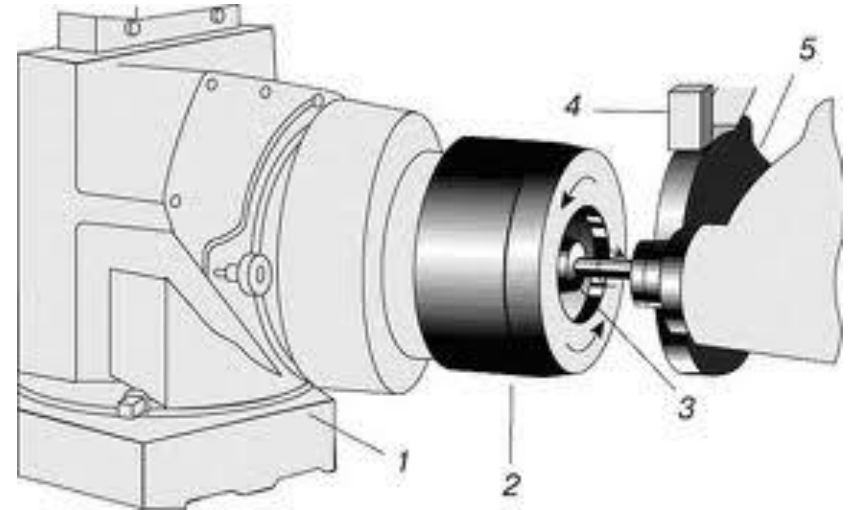
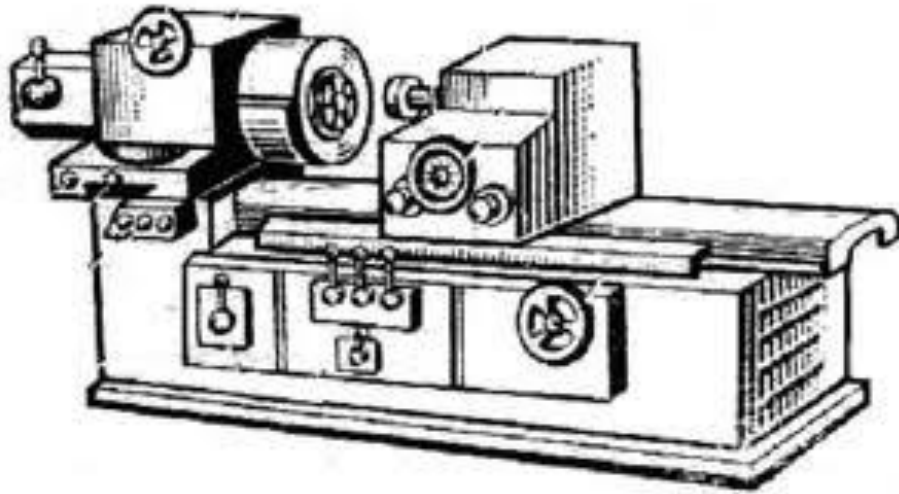
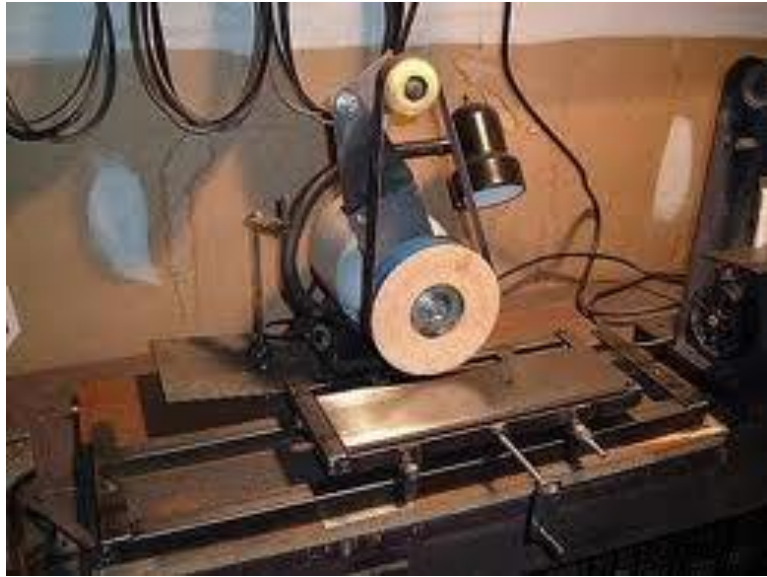
§4. Jilvirlash va jilvirlash dastgohlari

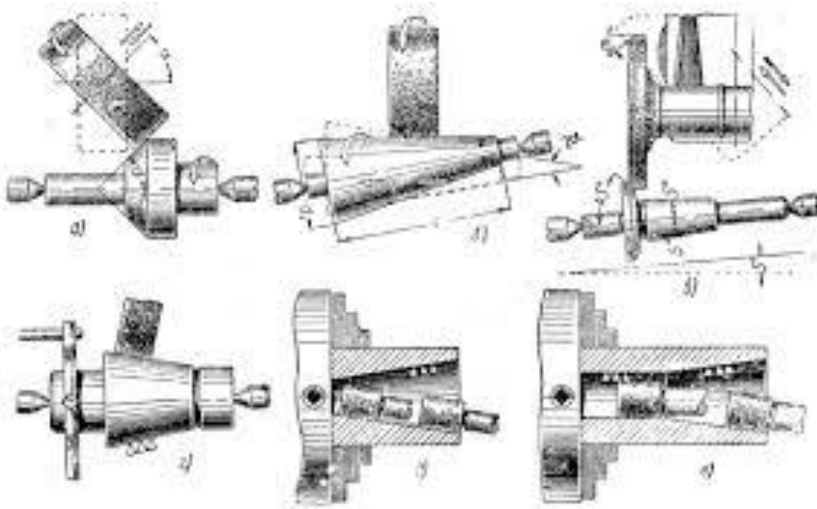
Jilvirlash deb xomaki sirtidan jilvirlash toshlar (charx toshlar) yordamida juda yupka qatlamni kesib, detal yuzasini yuqori tozalikka etkazish jarayonga aytiladi.

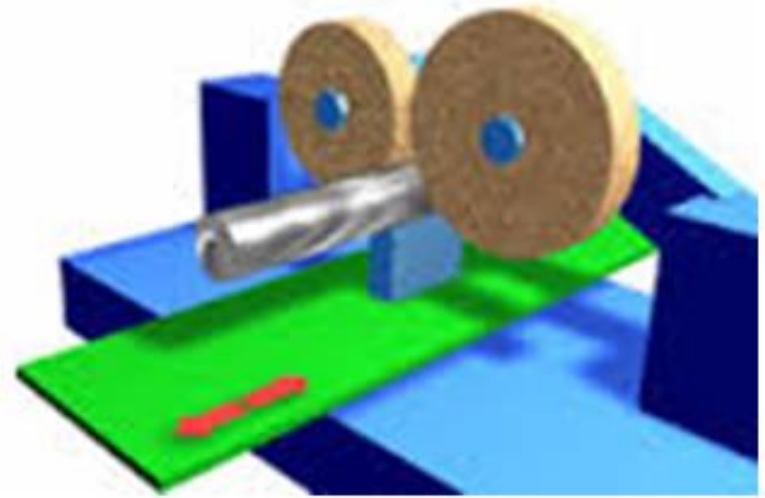
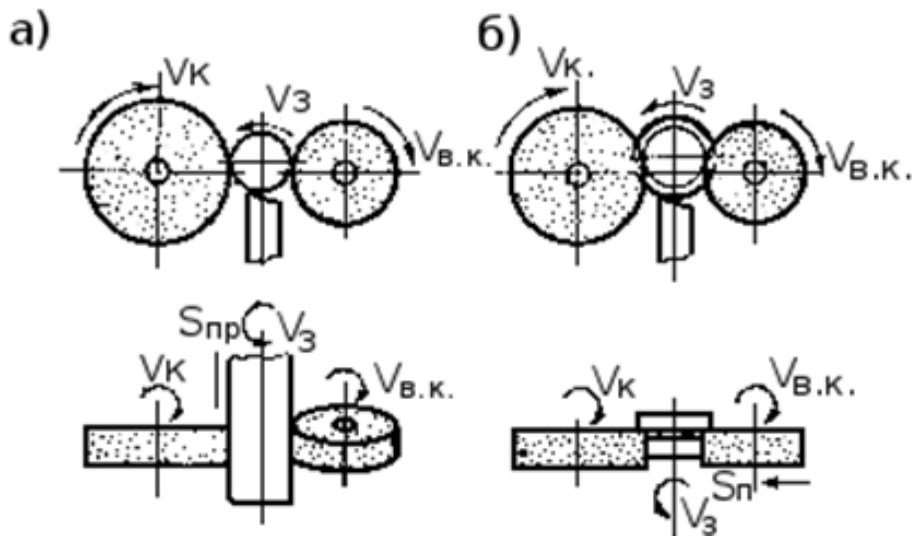


Yassi jilvirlash sxemasi







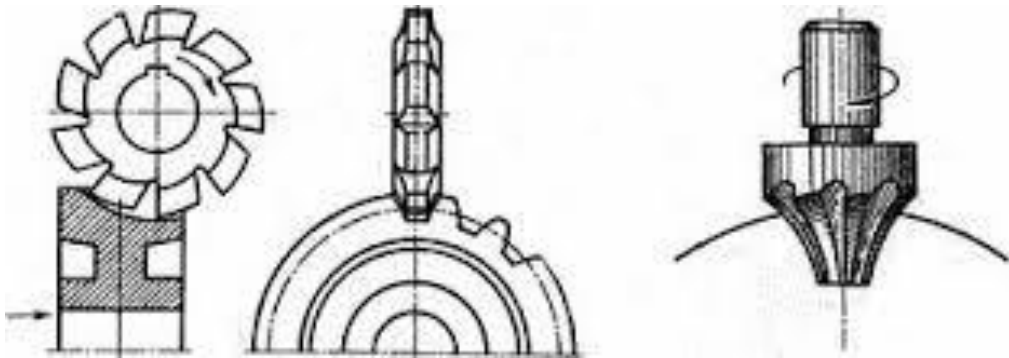


Markazsiz jilvirlash



§5. Tish qirqish va tish qirqish dastgohlari

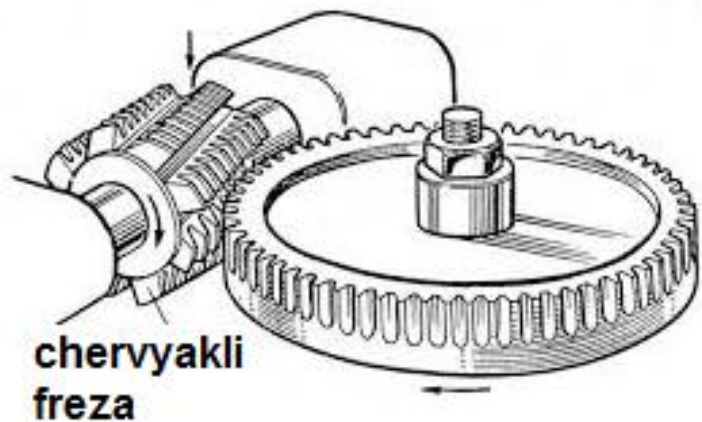
Tishli gildiraklar xomakilarida tish qirqish ikkita usul bilan amalga oshiriladi: kopirlash usuli va ilashish usuli.



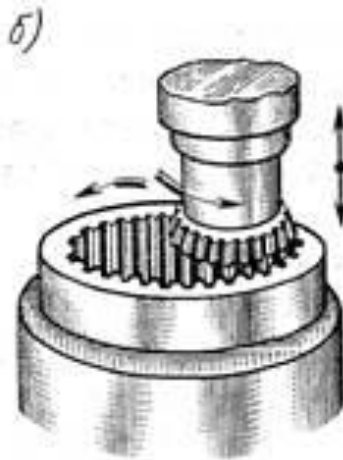
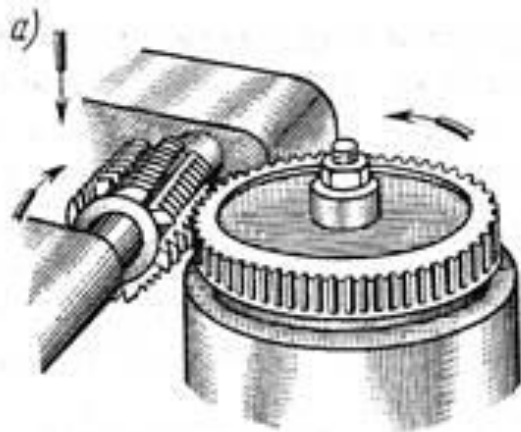
Bu jarayon gorizontal frezalash dastgohlarda bōlish kallagi yordamida amalga oshadi. Bu usul uncha aniq va yukori unumli emas, chunki xomakini kerakli burchakka burish paytida xatoliklar bulishi mumkin va bunga kōp vaqt ketadi.

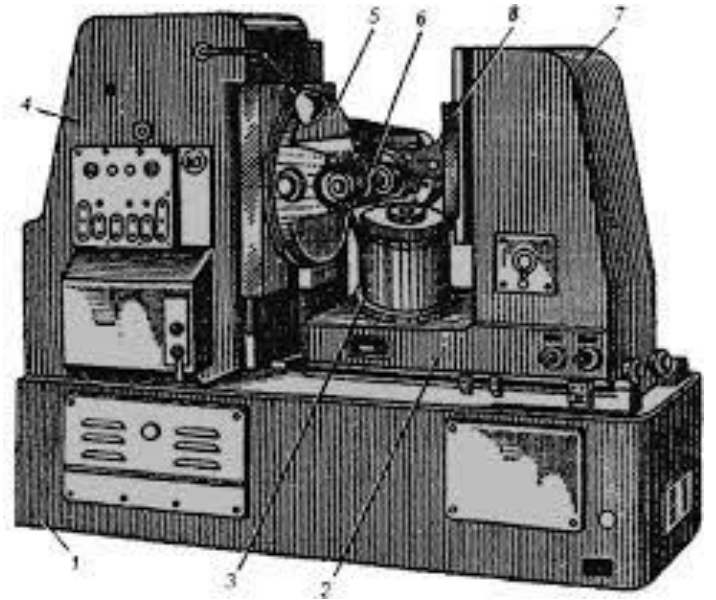
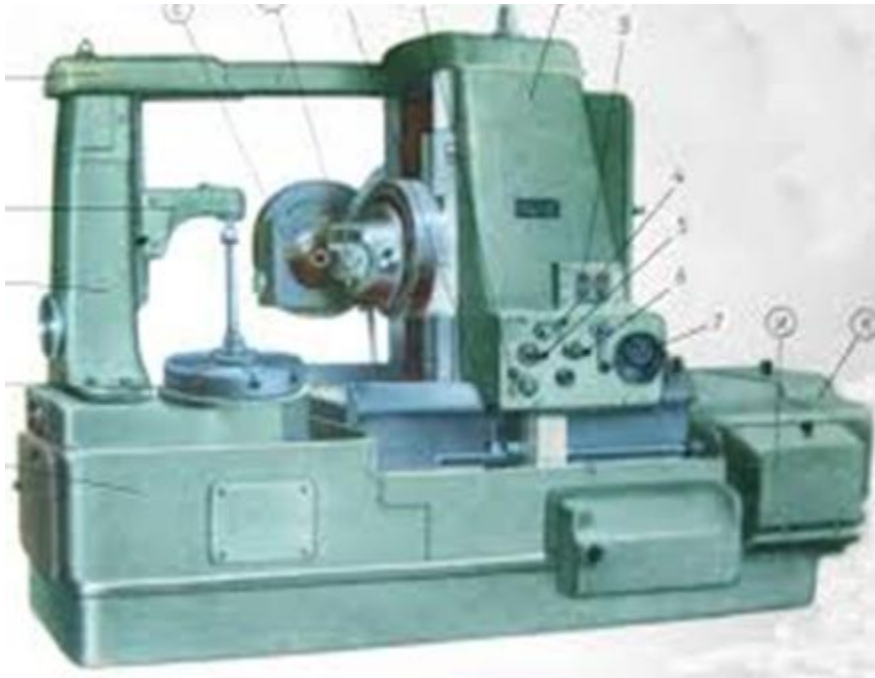
Kopirlash usuli ishlanadigan gildirakning har bir tish oraligini modulli diskli yoki modulli barmoqli freza bilan frezalashga asoslangan, ya'ni frezaning shakli ishlanadigan detalda kopirlanadi.



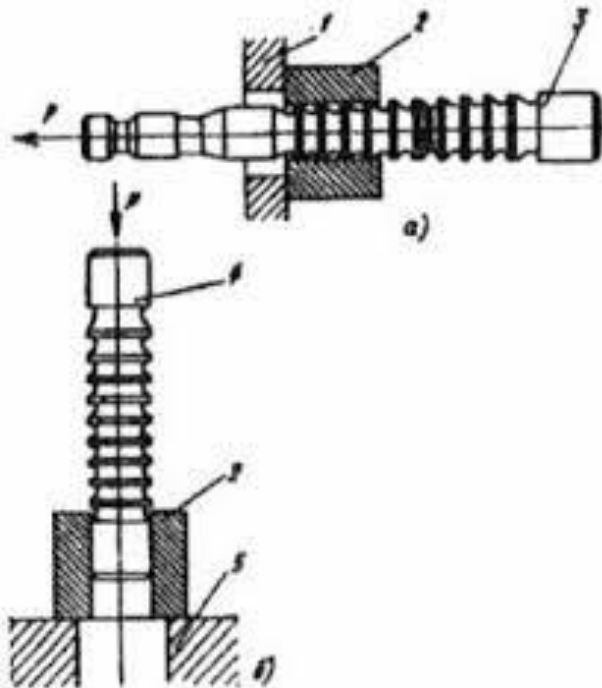


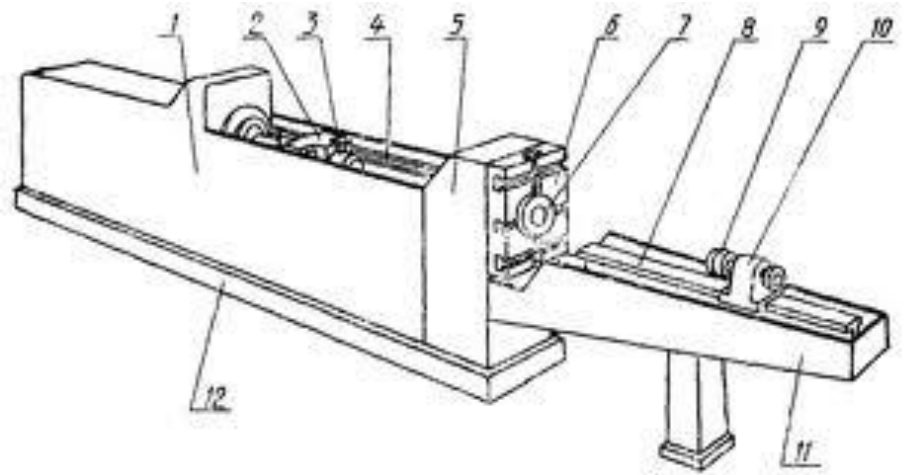
Ilashish usuli maxsus tish frezalash, tish o'yish va tish randalash dastgohlarda bajariladi. Bunda xomaki va tish qirqish asbob (chervyakli freza, o'yish yoki randalash keskich) xuddi ikkita tishli uzatmadagi gildiraklar kabi ilashib aylanadi. Kesuvchi asbobni kesuvchi tishlari ilashgan gildirak tishlarining shakliga o'xshaydi





Nazorat savollari





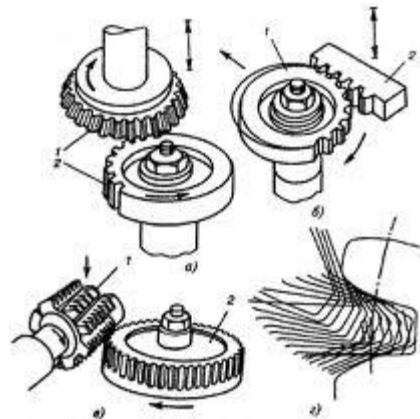
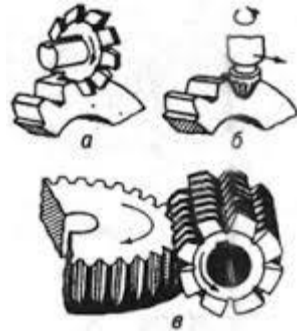


Рис. 3.2. Схема нарезания зубчатых колес методом обката:
 а – долбаком, б – гребенкой, в – червячной фрезой,
 г – профилирование зубчатого венца зубом червячной фрезы



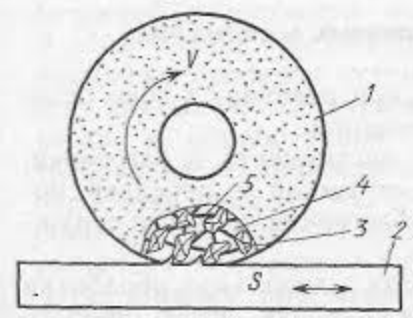
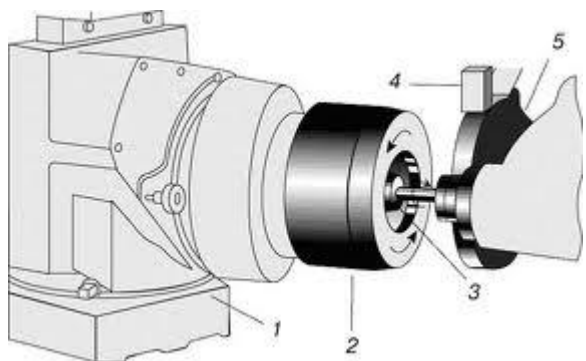
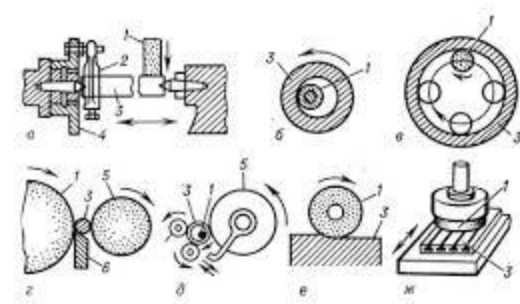


Рис. 13.1. Схема плоского шлифования





info@stankonormal.spb.ru

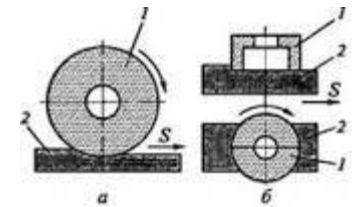
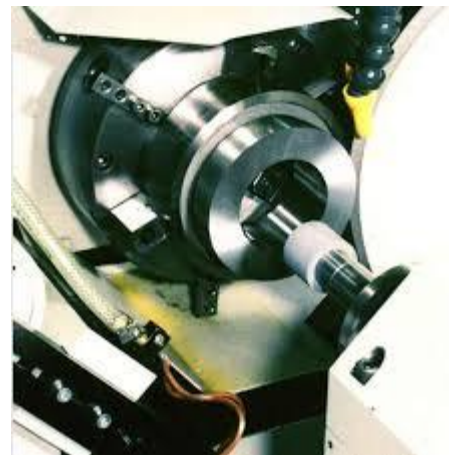
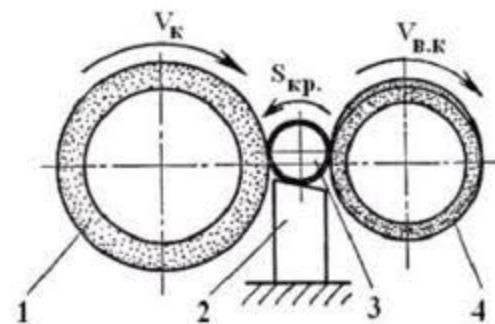
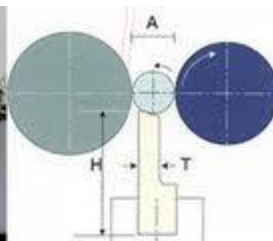
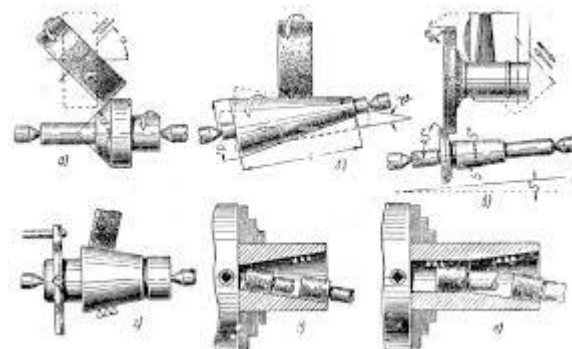
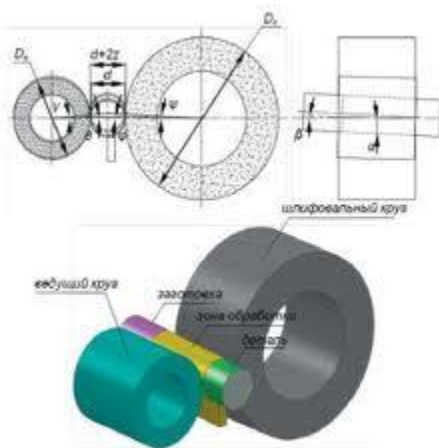
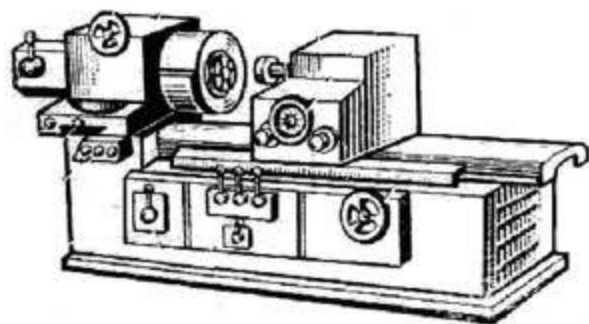
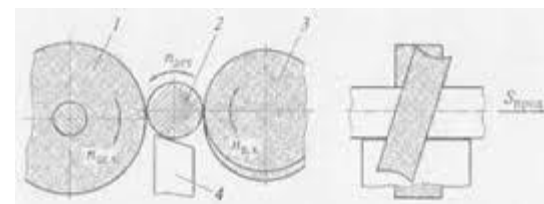
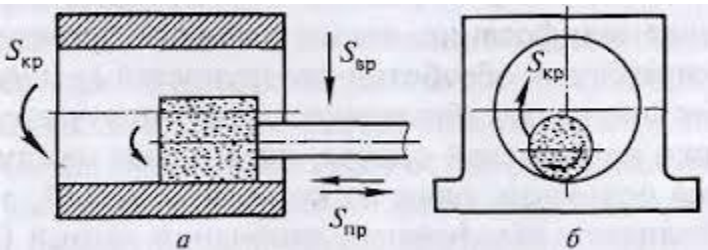
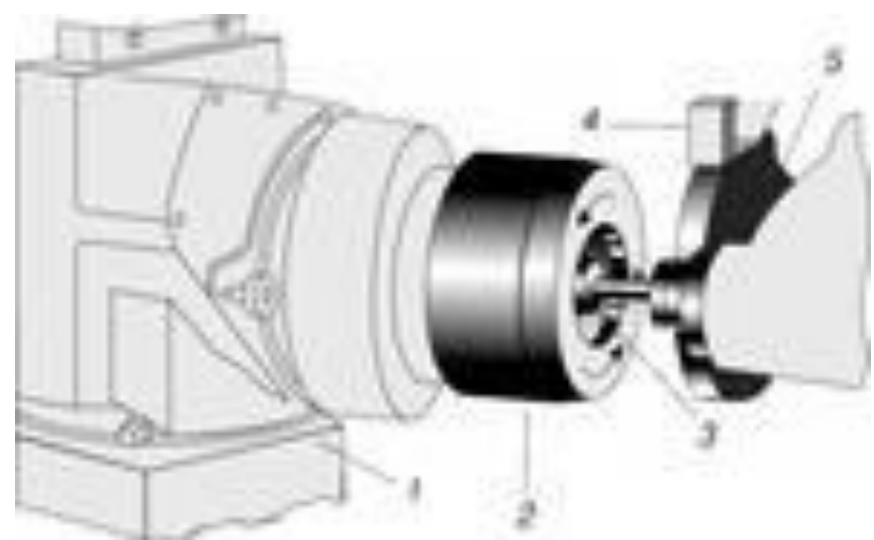


Рис. 6.35. Схемы шлифования:
а – периферийного круга; б – торцевого круга;
1 – шлифовальный круг; 2 – заготовка;
S – подача





Ishlanadigan yuzalarning shakliga jilvirlash tashki doiraviy jilvirlash (tsilindr, konus va fason yuzalar), ichki doiraviy jilvirlash, yassi jilvirlash va har xil shaklli shesternya tishlarini, rezbalarni, shmits sirtlarini jilvirlash turlarga bōlinadi.

Jilvirlash dastgohlarning asosiy turlari: doiraviy jilvirlash, ichki jilvirlash, yassi jilvirlash, fason yuzalarni jilvirlash, charxlash va yuzalarni juda sillik holatga etkazish dastgohlar.

Doiraviy jilvirlash dastgohlar markazli, markazsiz va maxsus doiraviy jilvirlash dastgohlarga bulinadi.

Markazli jilvirlash dastgohlarda xomaki dastgoh markazlarida joylashadi va ilgarilanma-qaytma harakat qiladi. Bu dastgohlar kōpincha donalab va seriyalab ishlab chiqarishda qullaniladi. Universal markazli dastgohlarda shpindel va jilvirlash kallaklari stol tekisligida buralishi mumkin, bularda konus yuzalarni jilvirlash mumkin.

Markazsiz jilvirlash dastgohlari yukori unumi bilan ajralib turadi va seriyalab hamda kōplab ishlab chiqarishda kōllaniladi.

Ichki jilvirlash dastgohlar ichki silindr, konus va torets yuzalarni jilvirlash uchun muljallangan.

Yassi jilvirlash dastgohlar tekisliklar, ariqchalarni jilvirlash uchun muljallangan bōlib, ikki xil stoli qilib ishlab chiqiladi: tōrburchak va doiraviy stol.

Doiraviy stoli jilvirlash dastgohlar kōpincha ommaviy ishlab chiqarishda uzluksiz jilvirlash uchun ishlatiladi.

Eng kōp tarkalgan dastgohlar – charx toshning cheti bilan ishlaydigan, stoli tōrburchak dastgohlar.

§5. Tishqirqish dastgohlari

Tishli gildiraklar xomakilarida tish qirqish ikkita usul bilan amalga oshiriladi: kopirlash usuli va ilashish usuli.

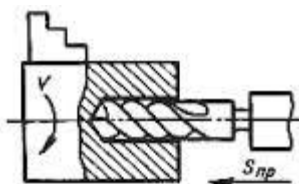
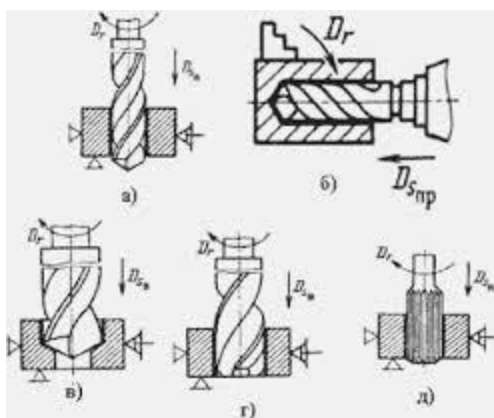
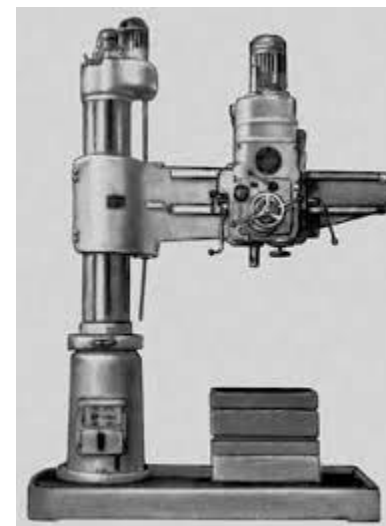
Kopirlash usuli ishlanadigan gildirakning har bir tish oraligini modulli diskli yoki modulli barmoqli freza bilan frezalashga asoslangan, ya'ni frezaning shakli ishlanadigan detalda kopirlanadi.

Bu jarayon gorizontal frezalash dastgohlarda bōlish kallagi yordamida amalga oshadi. Bu usul uncha aniq va yukori unumli emas, chunki xomakini kerakli burchakka burish paytida xatoliklar bulishi mumkin va bunga kōp vaqt ketadi.

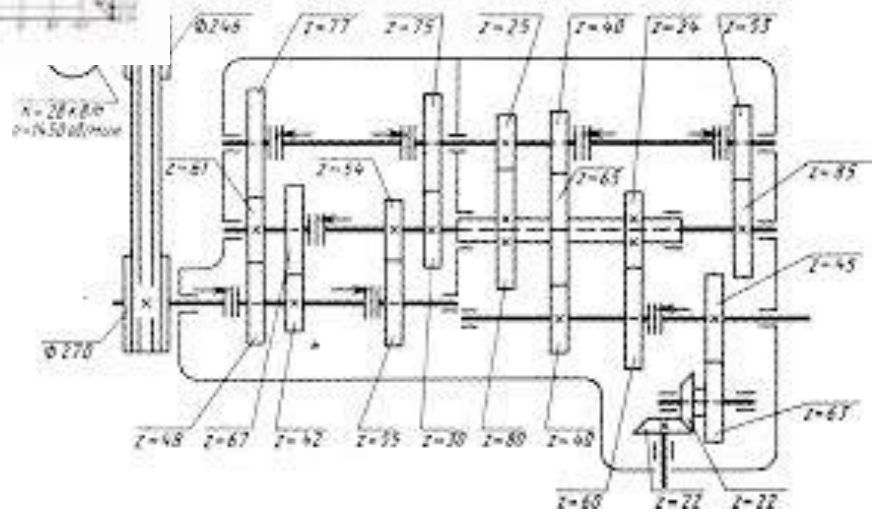
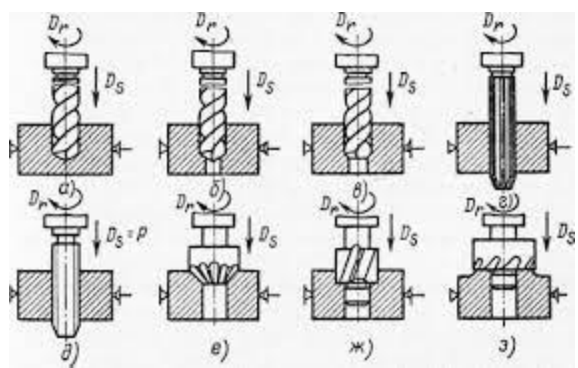
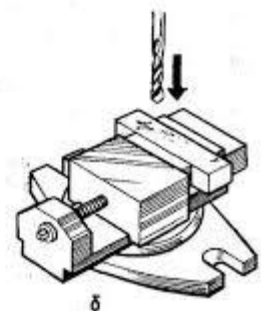
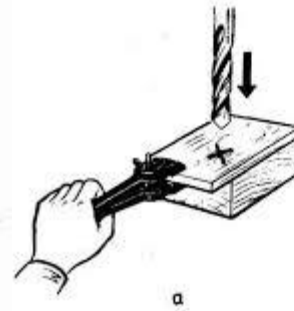
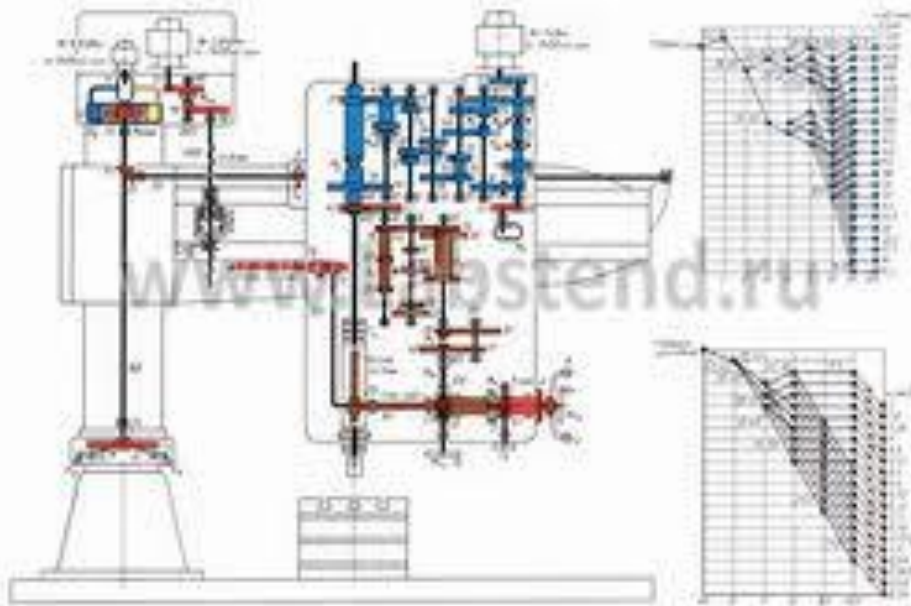
Ilashish usuli maxsus tish frezalash, tish ōyish va tish randalash dastgohlarda bajariladi. Bunda xomaki va tish qirqish asbob (chervyakli freza, ōyish yoki randalash keskichi) xuddi ikkita tishli uzatmadagi gildiraklar kabi ilashib aylanadi. Kesuvchi asbobni kesuvchi tishlari ilashgan gildirak tishlarining shakliga ōxshaydi.

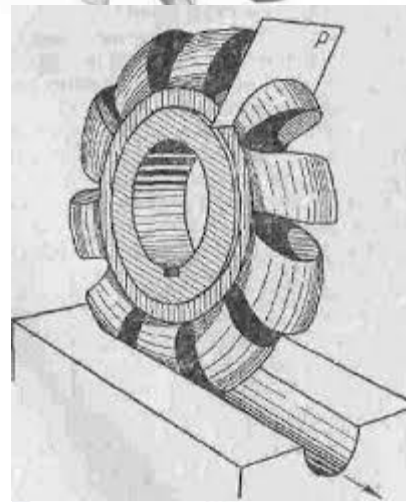
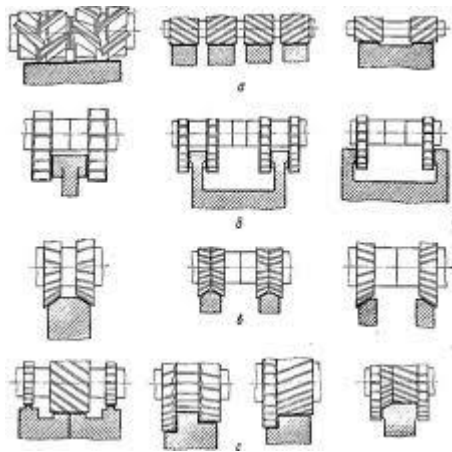
Nazorat savollari

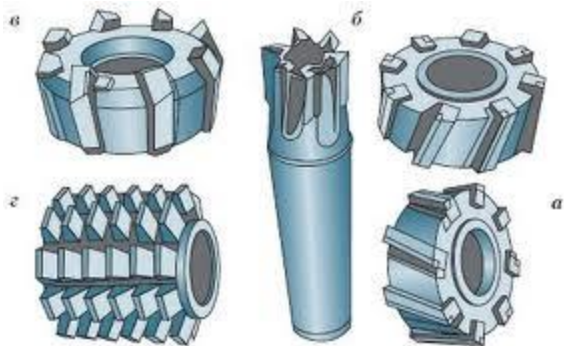
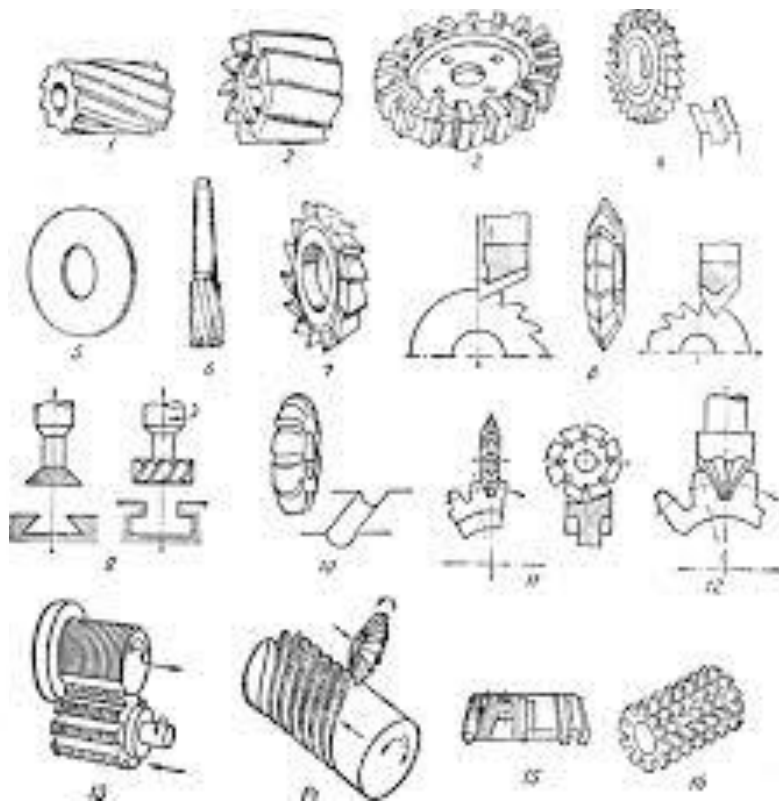
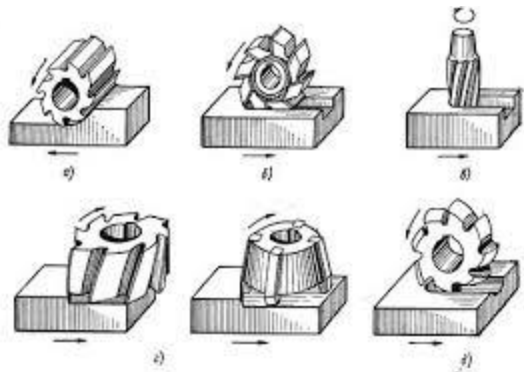
1. Parmalash va parmalash dastgohlari, ulardagi harakatlar, turlari va ishlatish sohalari.
2. Frezalash va frezalash dastgohlari, ulardagi harakatlar, turlari va ishlatish sohalari.
3. Randalash, uyish va sidirish, dastgohlar, ulardagi harakatlar, turlari va ishlatish sohalari.
4. Jilvirlash va tish qirqish dastgohlari, ulardagi harakatlar, turlari va ishlatish soxalari.



РАДИАЛЬНО-СВЕРЛИЛЬНЫЙ СТАНОК МОДЕЛИ 257
КИНЕМАТИЧЕСКАЯ СХЕМА







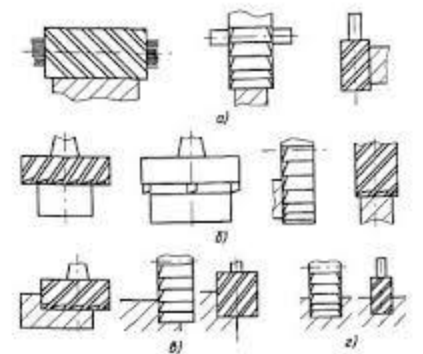


Рис. 1.80. Схемы фрезерования плоских попарностей:
 а — цилиндрического, б — торцового, в — дугообразного, г — трехстороннего

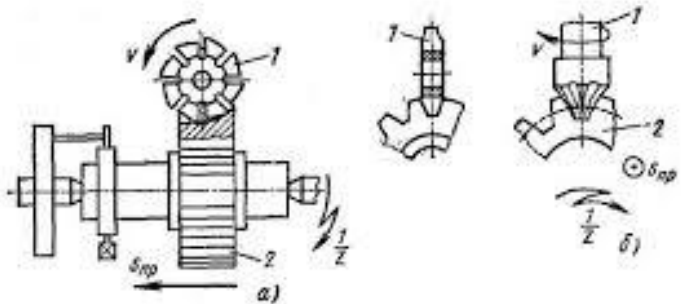
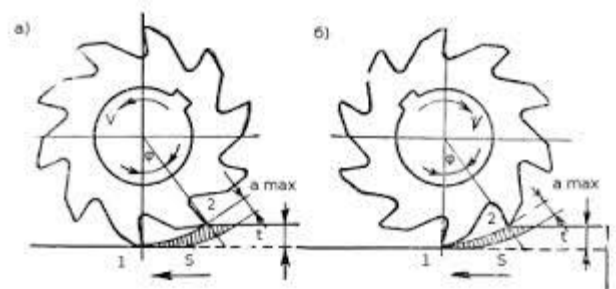


Рис. VI.105. Схемы фрезерования зубьев по методу копирования:
 1 — фреза; 2 — нарезаемое колесо

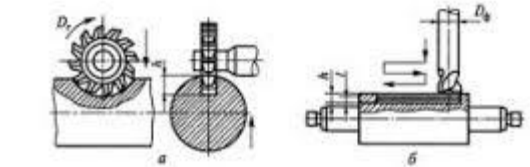
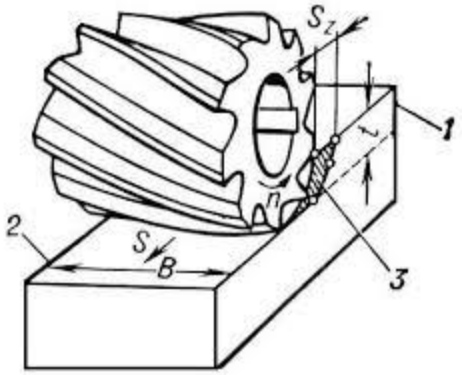
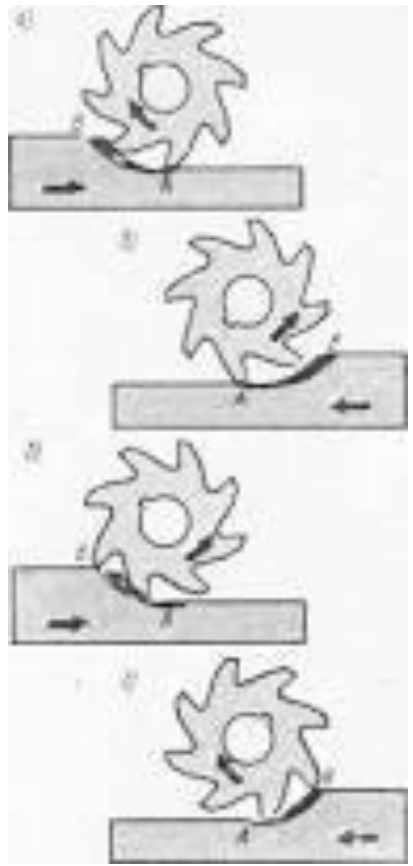
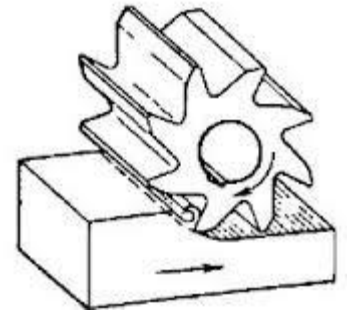


Рис. 5.25. Фрезерование шпоночных пазов:
 а — дисковыми фрезами с вертикальным или поперечным движением подачи; б — шпоночными фрезами с маятниковым движением подачи; D_r — направление движения резания; h — глубина фрезерования; D_k — диаметр конусной фрезы; t — притупок, снимаемый за один проход инструмента



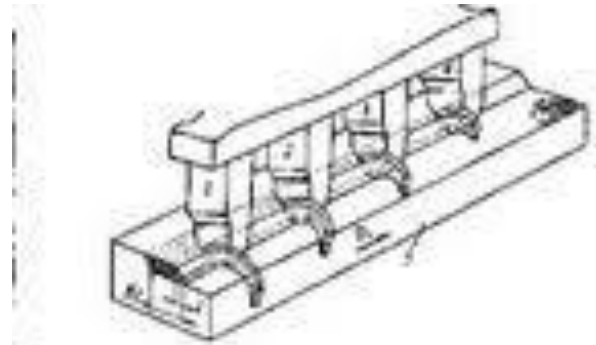
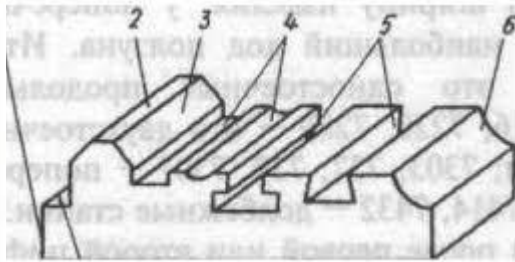
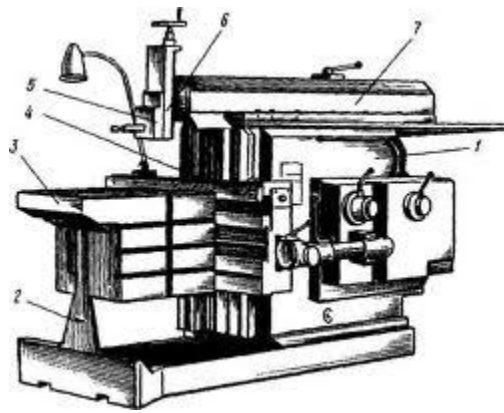
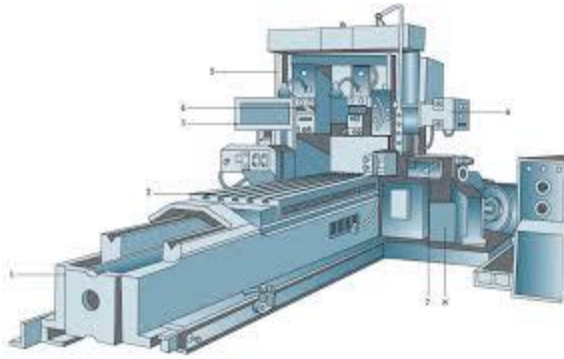


Рис. 12.1. Схема многопереходного резания:
 1 - 4 - резец; 5 - инструментальный стержень; 6 - инструментальный стержень
 с резьбой

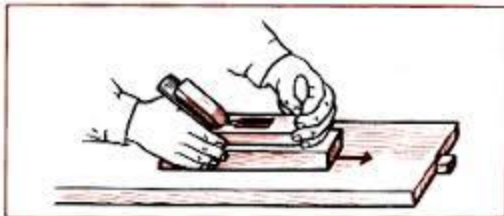
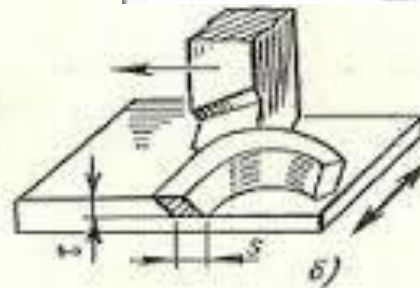
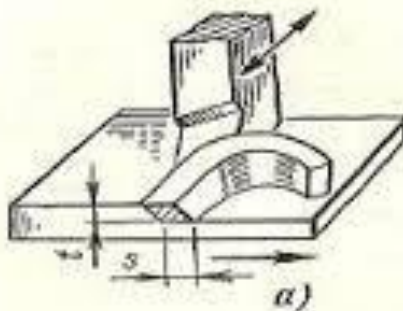


Рис. 32. Стругание рубанком





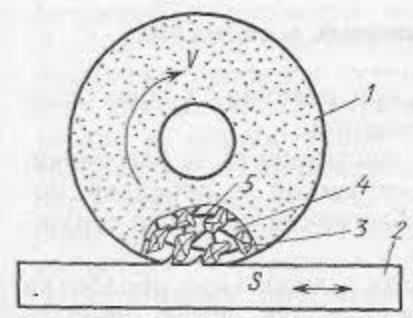
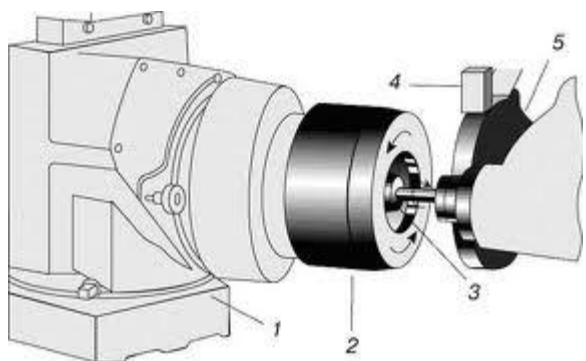
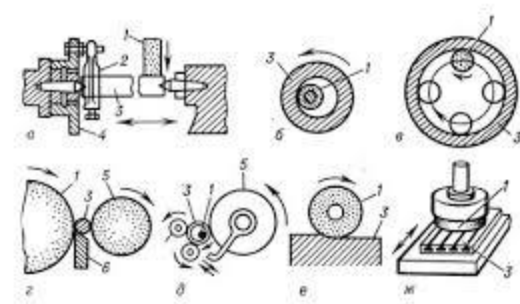


Рис. 13.1. Схема плоского шлифования





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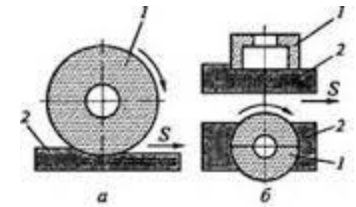
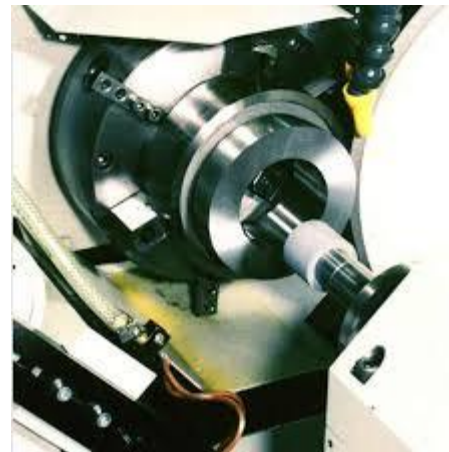
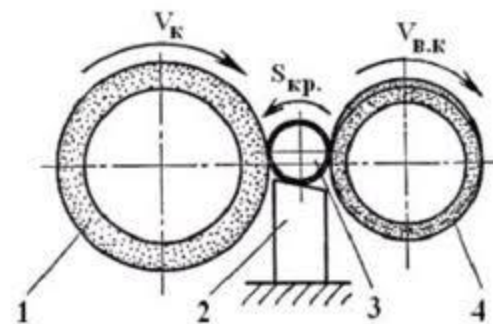
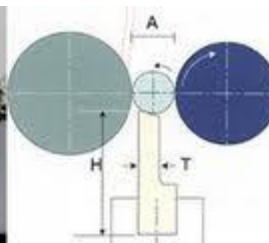
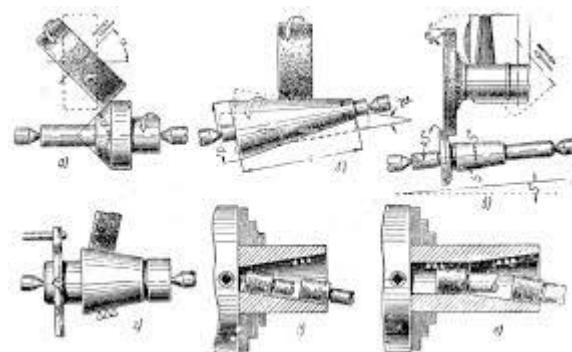
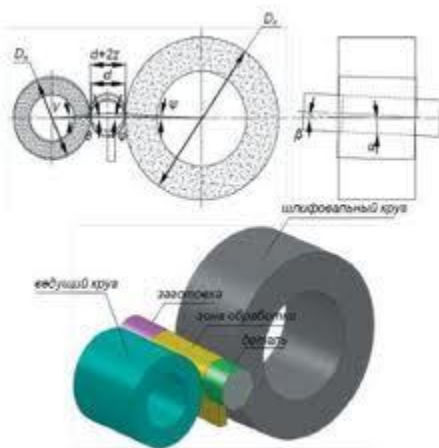
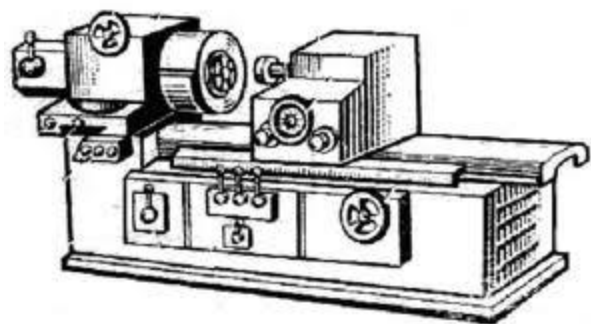
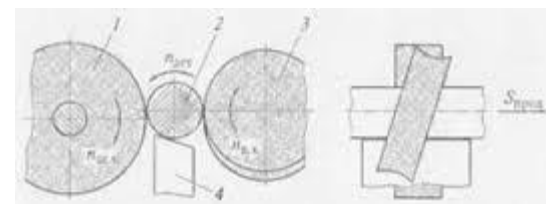
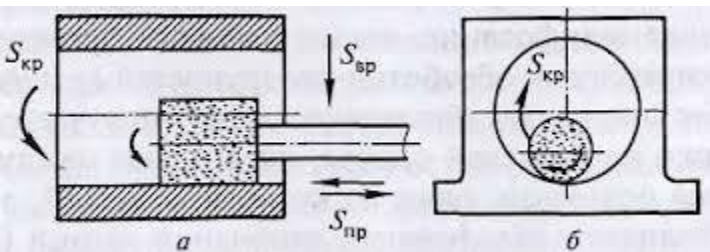


Рис. 6.35. Схемы шлифования:
а – периферийного круга; б – торцевым кругом;
1 – шлифовальный круг; 2 – заготовка;
S – подача



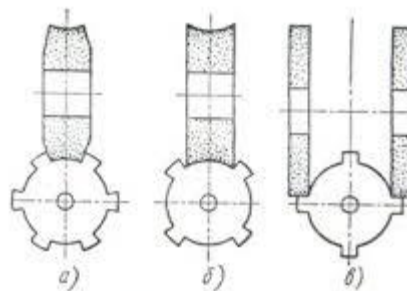
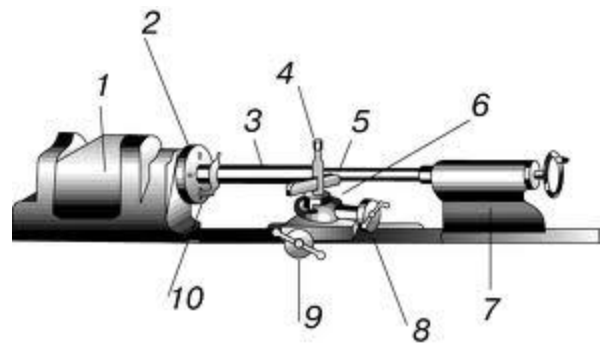
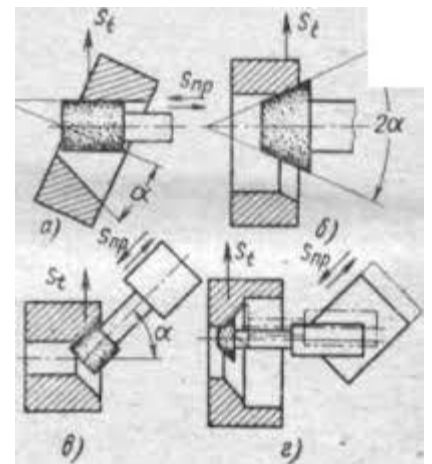
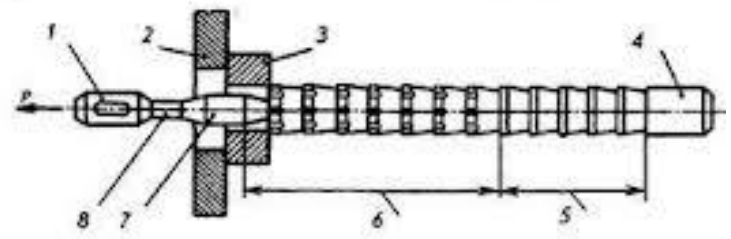
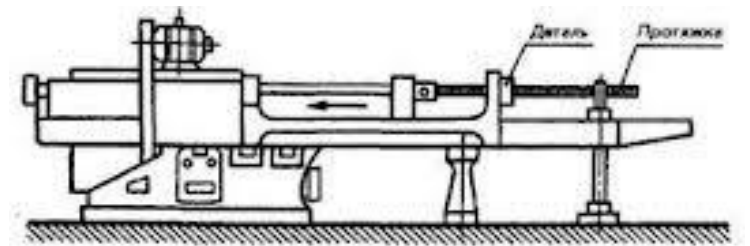
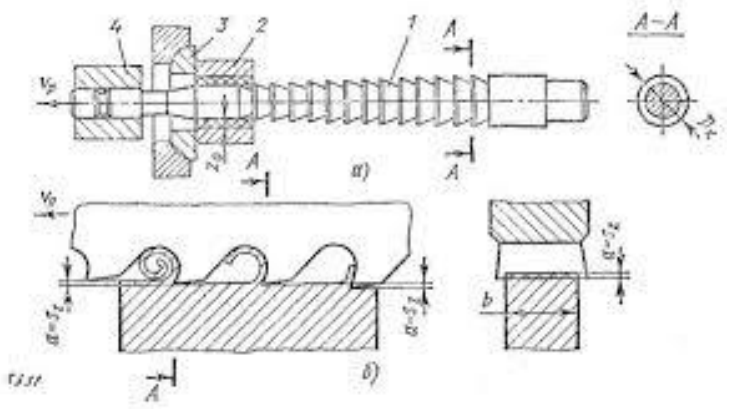
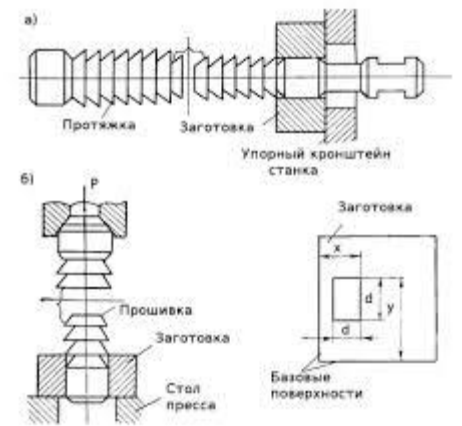
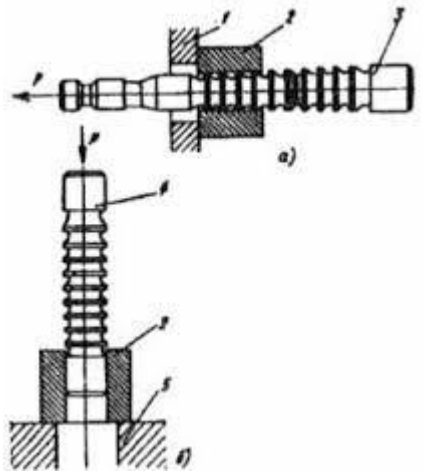
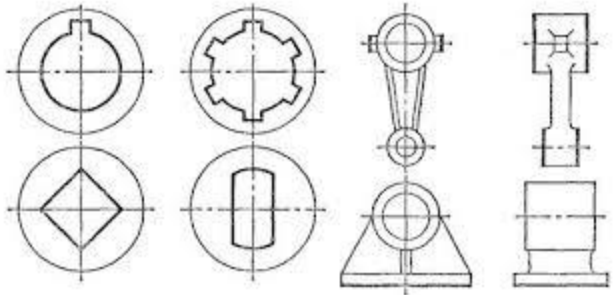


Рис. 2. Обработка шлицев методом деления:
 а — одновременное шлифование впадины и боковых поверхностей; б — шлифование впадины; в — шлифование боковых поверхностей





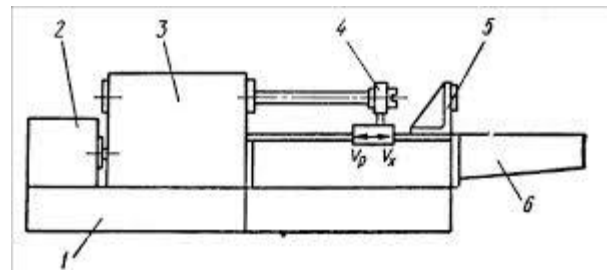
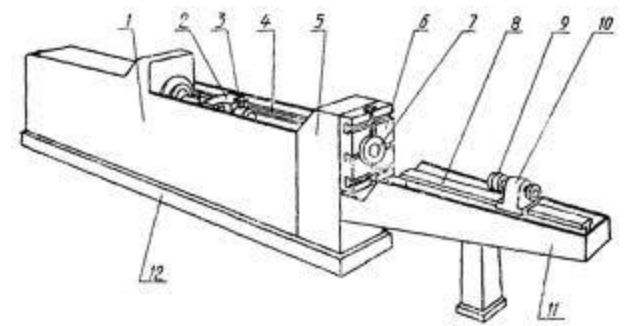
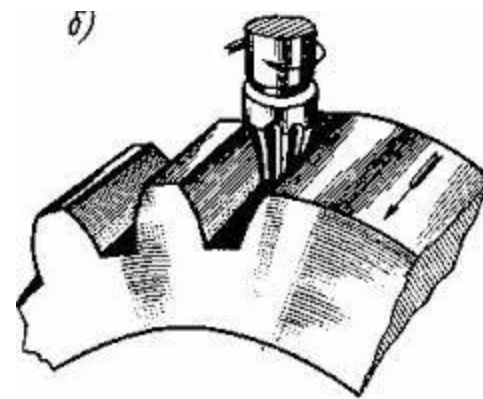
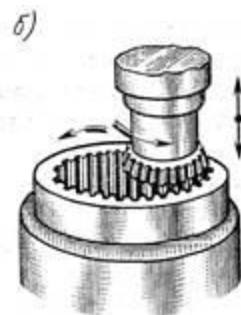
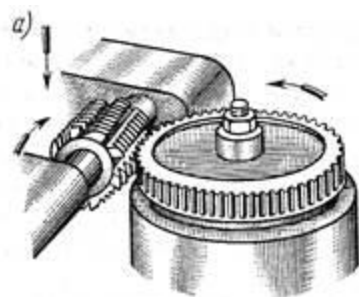
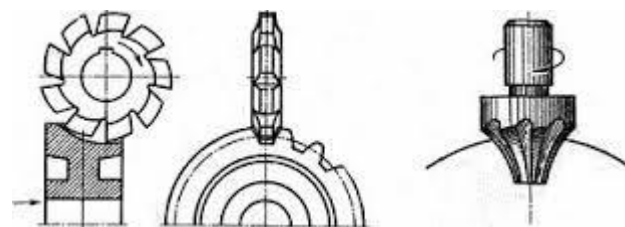
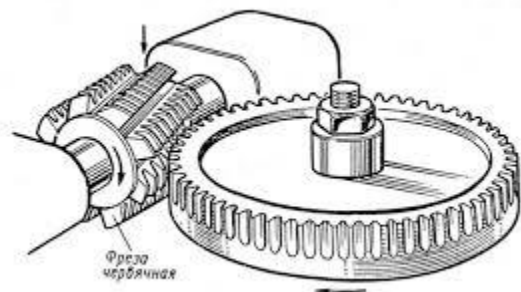


Рис. 3. Общий вид горизонтально-протяжного станка





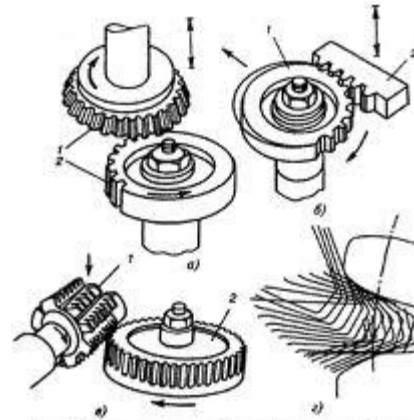
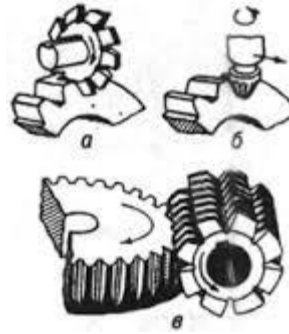


Рис. 3.2. Схема нарезания зубчатых колес методом обката:
а – добаком, б – гребенкой, в – червячной фрезой,
г – профилирование зубчатого венца зубом червячной фрезы,
д – профилирование зубчатого венца зубом червячной фрезы



