

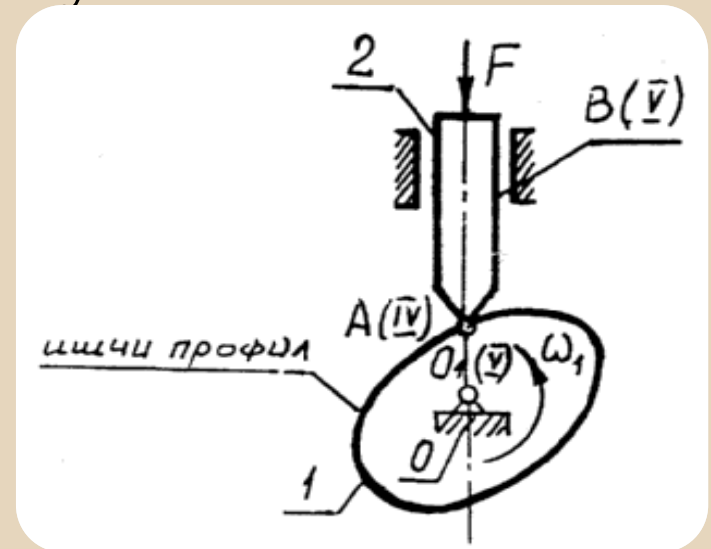
MUSHTAKLI MEXANIZMLAR, ULARNING HARAKAT QONUNLARI VA LOYIHALASH USULI

REJA:

- **Mushtakli mexanizm turlari**
- **Mushtakli mexanizmlarni loyihalash**
- **Mushtakli mexanizmlarning afzalliklari va kamchiliklari**

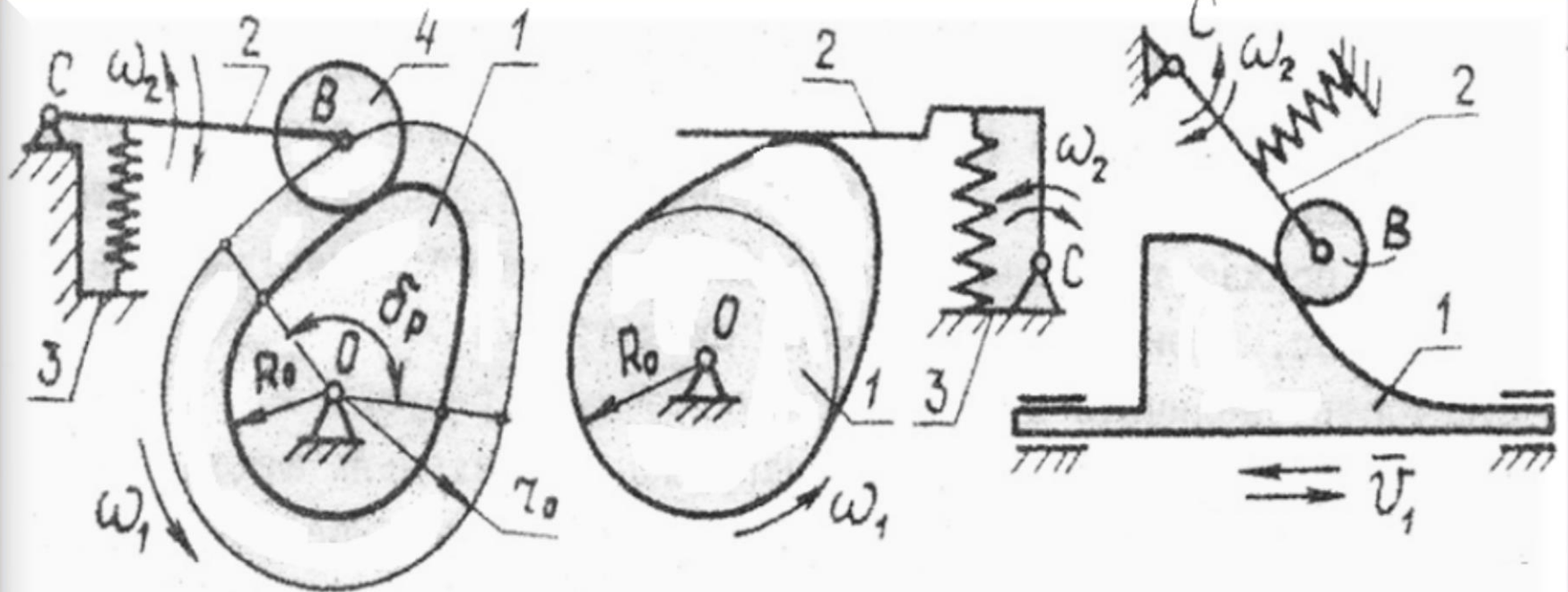
Etaklovchi zvenoning harakatini oliy kinematik juft vositasida o'zgaruvchan mexanizmlarga mushtakli mexanizmlar deb nomlanishi aytib o'tildi.

1. Mushtak.
2. Turtgich (tolkotel)
3. Tayanch (stoyka)

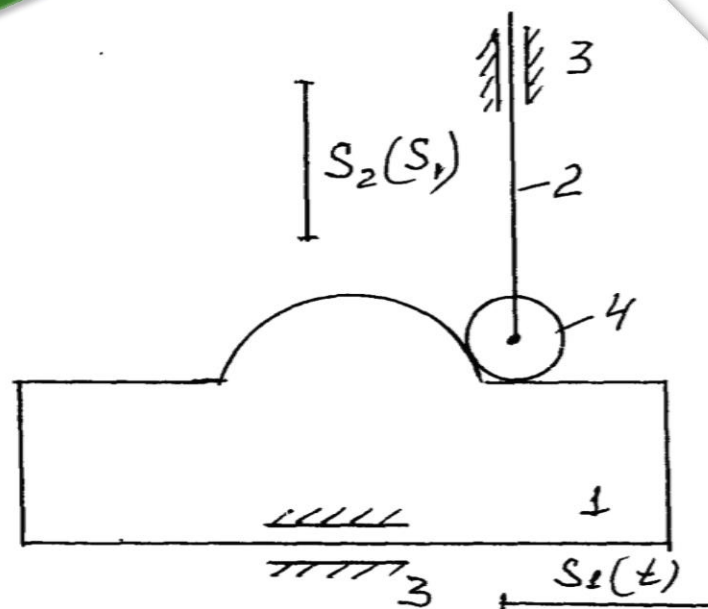
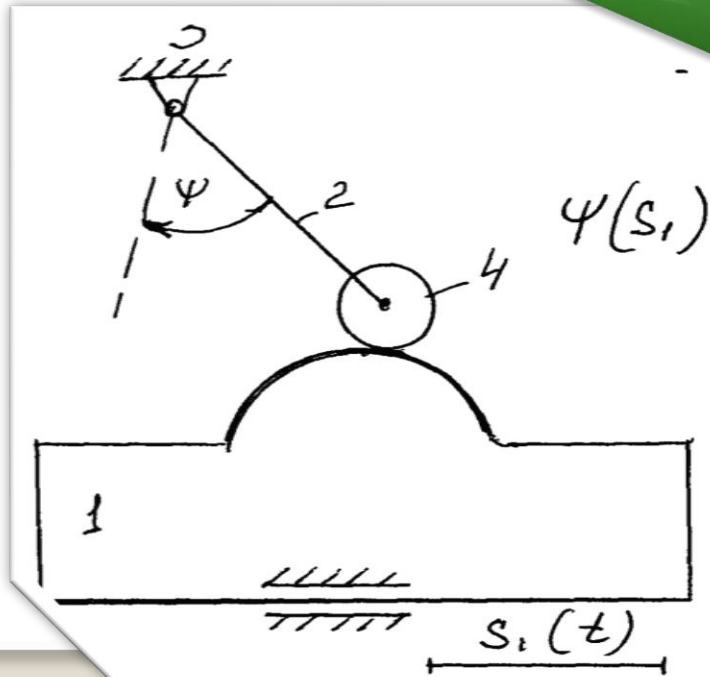


Mushtakli mexanizmlar, asosan, tayanch, mushtak va turtgich hamda qo'shimcha (rolik, prujina) moslamalardan iborat bo'ladi.

**Aylanma harakat burilma
(tebranma) harakatga
quyidagicha o'zgatiriladi.**

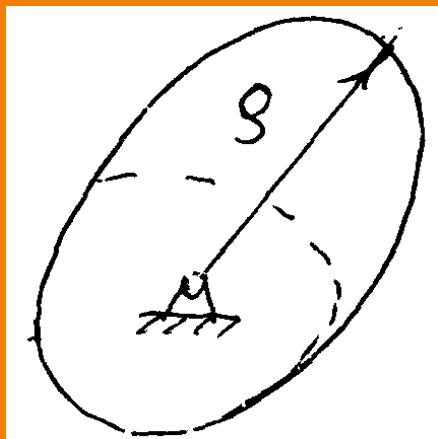


Ilgarilanma-qaytma harakatni tebranma yoki boshqa qonuniyat bilan harakatlanuvchi ilgarilanma-qaytma harakatga o'zgartirish mumkin .

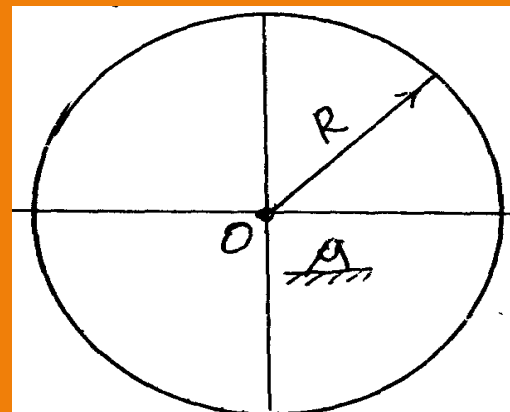


Mushtaklarning tuzilishi.

*egrilik radiusi ixtiyoriy ravishda
o'zgaruvchi mushtak*



sinusoidal mushtak



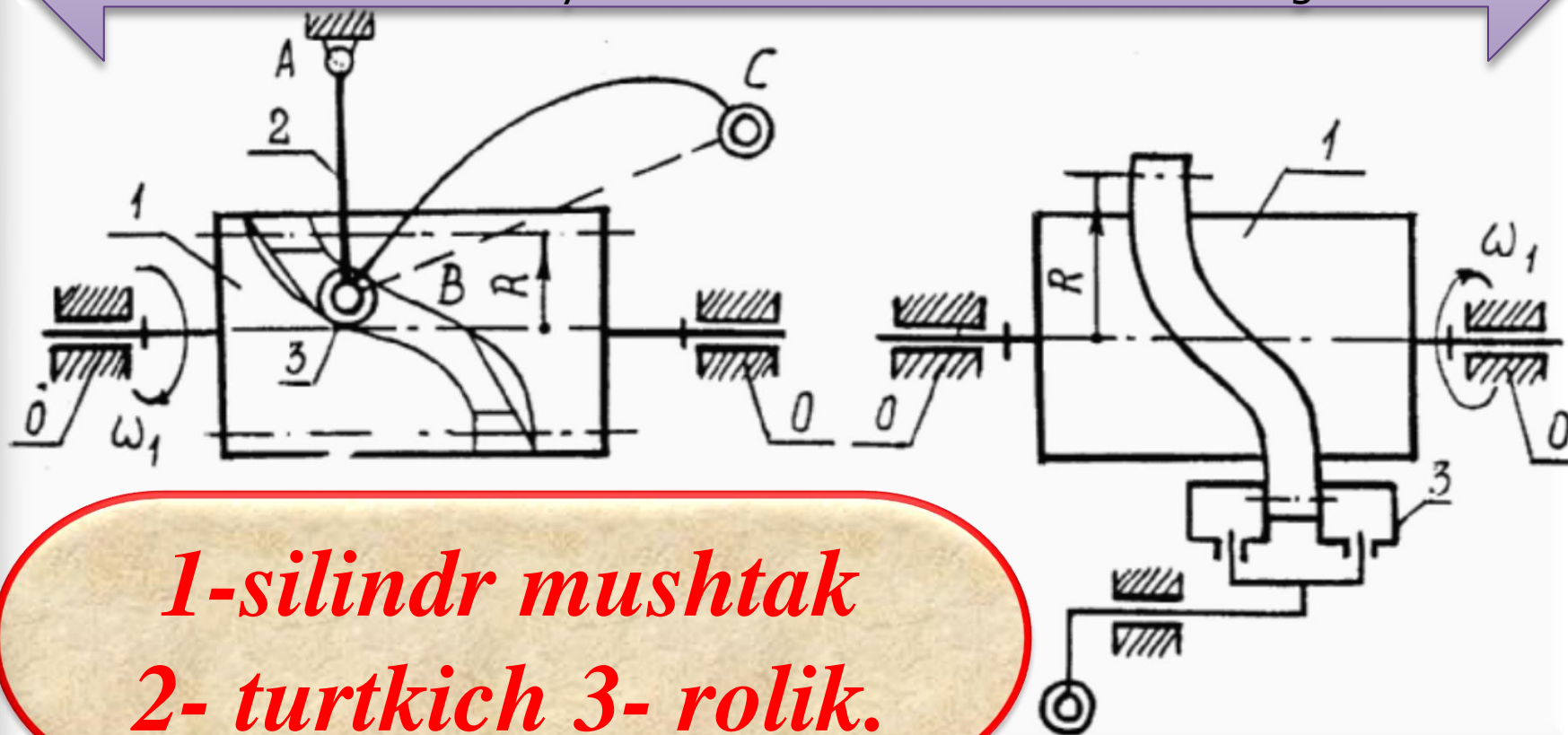
Bo'g'inlarning nisbiy
harakatiga qarab mushtakli
mexanizmlar:

tekis

fazoviy

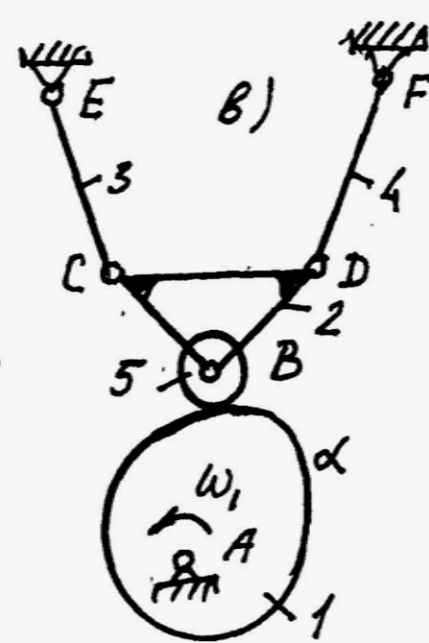
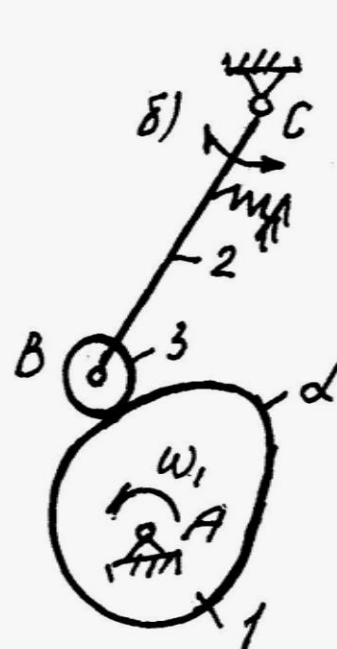
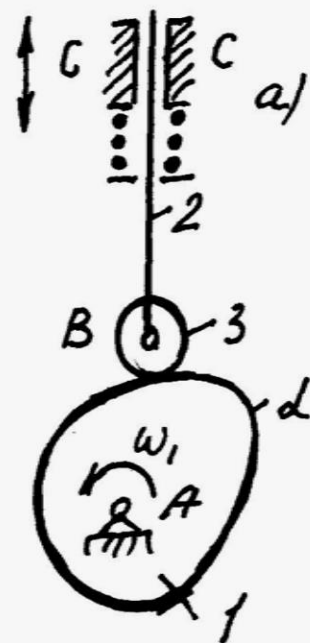
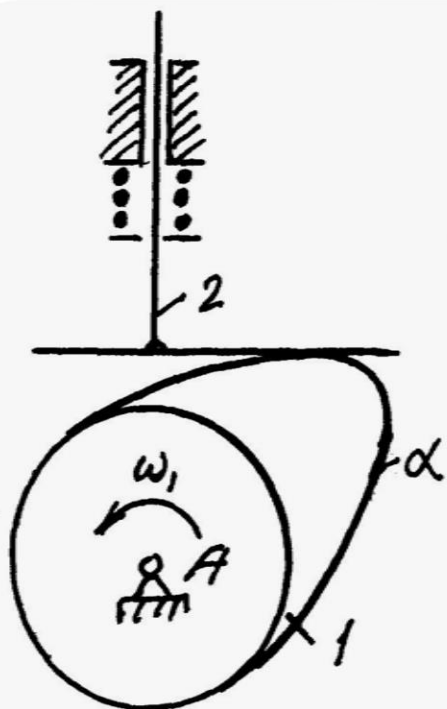
Fazoviy mushtakli mexanizm

Quyidagi shaklda ipni ma'lum miqdorda uzatuvchi va chokini tortuvchi fazoviy mushtakli mexanizmlar ko'rsatilgan.



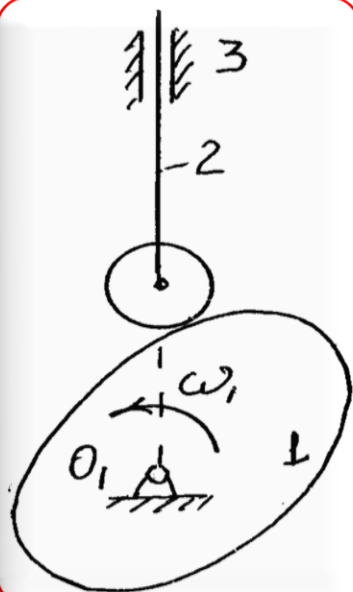
*1-silindr mushtak
2- turtkich 3- rolik.*

Fazoviy mushtakli mexanizmlarga qaraganda tekis mushtakli mexanizmlar ko'proq qo'llaniladi, chunki ularni tayyorlash va ishlatish oson.

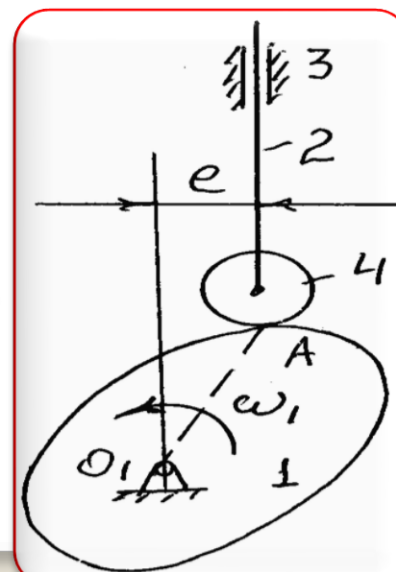


Mushtakli mexanizmlar mushtak va turtkich o'qlarini joylashishi bilan ham farq qiladi.

Aksial mushtakli mexanizm

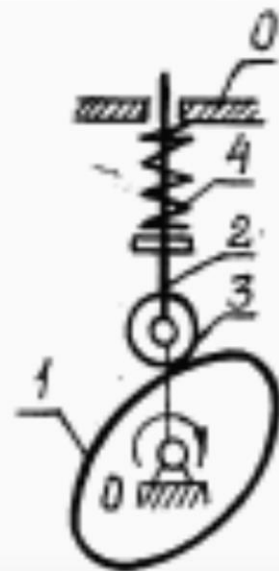
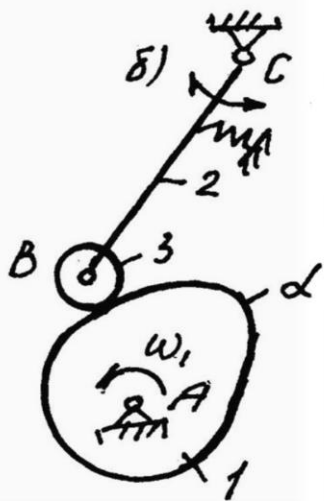


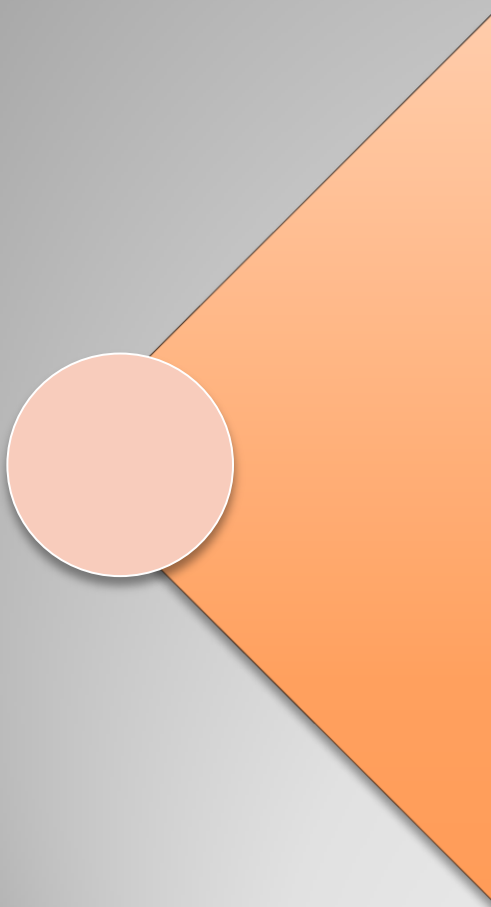
Dezaksial mushtakli mexanizm



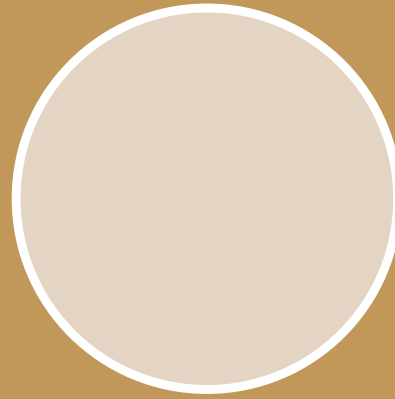
Turtkich o'qining siljishi dezaksiallik yoki ekstentristet deb ataladi

Mushtakni va turtkichni oliy juftda doimiy tutashib turishini ta'minlab turishi uchun kinematik yoki kuch tasirida tutashish usullari qo'llaniladi. Kuch ta'sirida tutashishda og'irlik kuchidan yoki prujinani qayishqoqligidan foydalanilsa, kinematik tutashish konstruktsiyani geometrik xususiyati orqali ta'minlanadi.





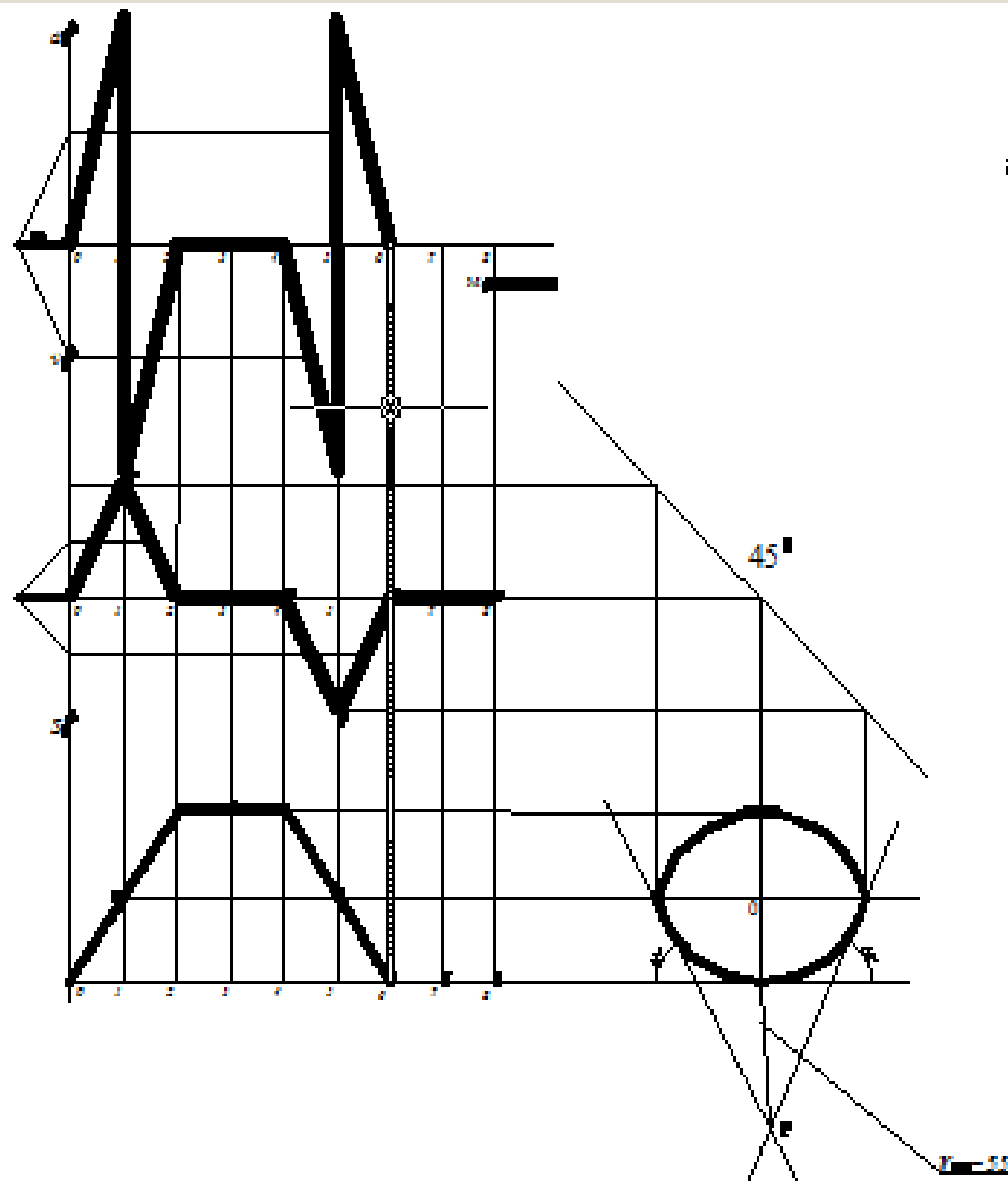
Kulachokli mexanizmlarning dinamik loyihalashda kulachokning eng kichik uzatish burchagi hisobga olinadi va eng kichik radiusi topiladi. Bu dinamik usulda loyihalash deyiladi. Dinamik usulda loyihalashning afzalligi shundaki, kulachokli mexanizmlar kulachokning xar qanday tezlikdagi harakatda ham normal ishlay oladi. Loyihalashda uzatish burchagi hisobga olinmasa, kulachokning aylanishi jarayonida turtkich o`z yo`naltiruvchisi orasiga tiqilib qolishi mumkin, noto`g`ri ishlab sinishi ham mumkin.



Yo'l diagrammasining absissasi (harakat davri) va yordamchi aylanani bir xil teng bo'laklarga bo'linadi (masalan 8 bo'lakka).

Diagrammaning absissalar o'qida olingan nuqtalaridan ordinatalar o'qiga parallel chiziqlar o'tkazib, xolatlarga to'g'ri keladigan diagramma egri chizig'ining nuqtalari 1', 2', 3', ... ni topib va ularni turtkich o'qi (1'', 2'', 3'' ...) ga hamda yordamchi aylanani tegishli radius vektorlarining davomiga proeksiyalab, so'ngra o'zaro tutashtirilsa, izlanayotgan kulachokning profili hosil bo'ladi.





1-shakl



Turtkichi rolikli dezaksial kulachokli mexanizmni loyihalash

1. Dezaksial kulachokli mexanizmlarni loyihalashda harakat qonuni, kulachokning minimal radiusi, rolik radiusi va dezaksial oraliq berilgan bulishi kerak. Agar harakat qonuni tezlanish yoki tezlik diagrammalari kurinishida berilgan bulsa, uni integrallash yo`li bilan yo`l grafigi $S - t$ ni keltirib chiqarish lozim bo`ladi.

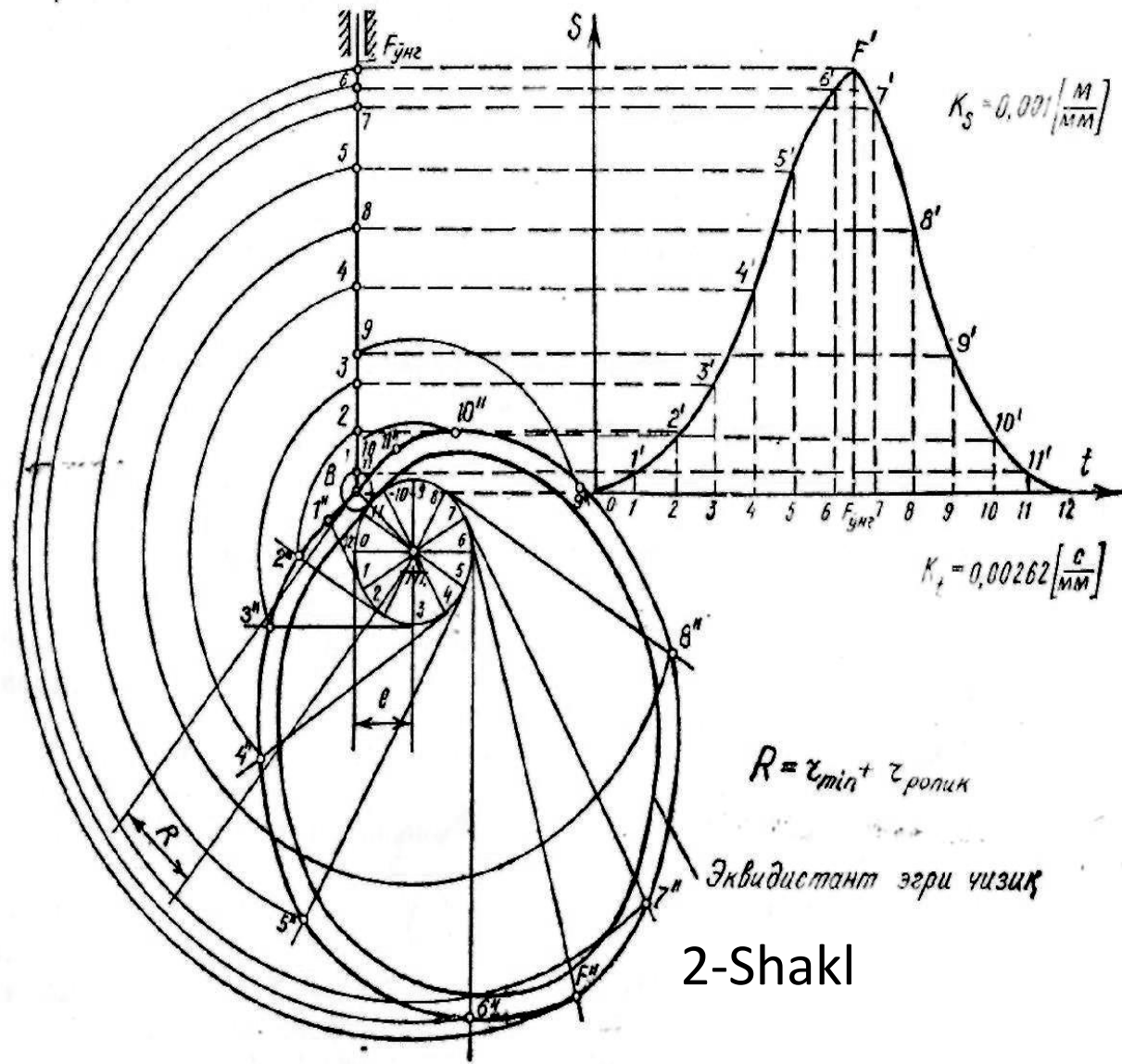
- Bunday mexanizm quyidagi tartibda loyihalaniadi (2-shakl).
- Yo`l grafigining abstsissalar o`qi davomida turtkich roligining markazi B tanlab olinadi.
- Rolik markazi B va dezaksial oraliq e dan turtkich va kulachok o`qlari diagramma ordinatasnga parallel qilib o`tkaziladi.

Rolik markazidan rolik va kulachokning minimal radiuslari yigindisiga teng radius $(r_{m)n} + /-_{rol} = R)$ li ey chiziladi. Yoyning kulachok o`qi bilan kesishgan nuqtasi kulachokning aylanish o`qi bo`ladi.

5. Kulachokning aylanish o`qi O dan dezaksial oraliq qiymatiga teng bo`lgan e radius bilan yordamchi aylana chiziladi.

Yordamchi aylana va yo`l grafigining absissa o`qlari bir xil teng (masalan, 12) bo`laklarga bo`linadi.

6. Aylananing bo`linish nuqtalariga



2-Shaki

Mexanizm quyidagi afzalliklarga ega:

- **Yetaklovchi va yetaklanuvchi zvenolarning harakatini oddiy qurilma yordamida boʻylash mumkin.**
- **Yetaklanuvchi zveno uzluksiz harakat qilganda yetaklanuvchi zvenoning istalgan ravishda harakatlantirish, to'xtash va teskari yo'nalishda yurgizish mumkin.**
- **Ixtiyoriy ravishda berilgan tenglama yoki grafik funktsiya bo'ylab yetaklanuvchi zvenoning harakatlantirish mumkin.**
- **Mexanizmni tuzilishi nihoyatda sodda bo'lib, gabarit o'lchovlari ixchamligi bilan ajralib turadi.**

Mushtak katta tezlikda aylanganda kuch bilan tutashuvchi mexanizm barqaror ishlamasligi mumkin. Shuning uchun geometrik tutashuvchi mexanizmlardan foydalanish zarur. Biroq bo'g'inlarning nisbiy harakatini cheklay olmaydigan ortiqcha bog'lanishlarning kiritilishi mexanizmni tayyorlash va yig'ish aniqligini oshirishni talab qiladi. Bu esa geometrik kamchilik hisoblanadi.