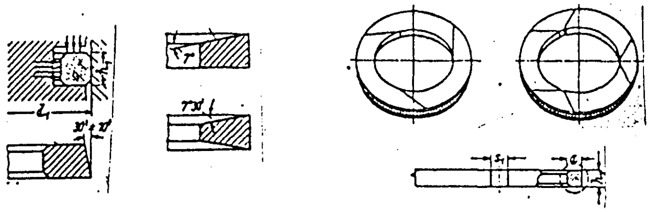
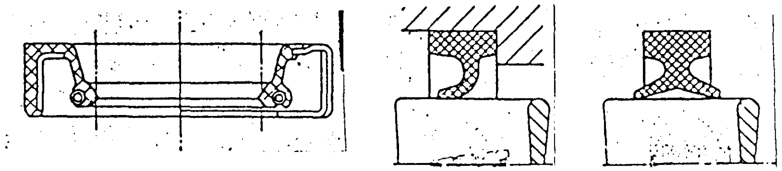
Tesnila za tesnenje med rotirajočimi deli

Pri visokih rotacijskih hitrostih, visokih pritiskih in temperaturah uporabimo za tesnenje odlikovno obstojne gladke elemente. iz kovine, sive litine in sinter kovine.

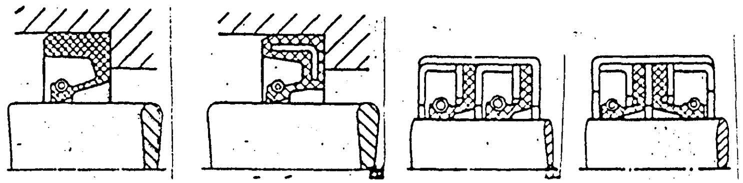


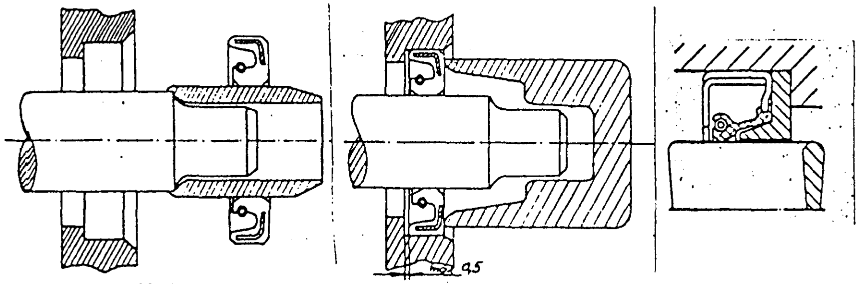
Za tesnenje na vrtečih gredeh in ohišjih ter pri majhnih razlikah pritiskov, pa je p primerna uporaba klobučastih tesnil (simering) iz gume ali umetnih mas.



Tovrstna tesnila delimo na:

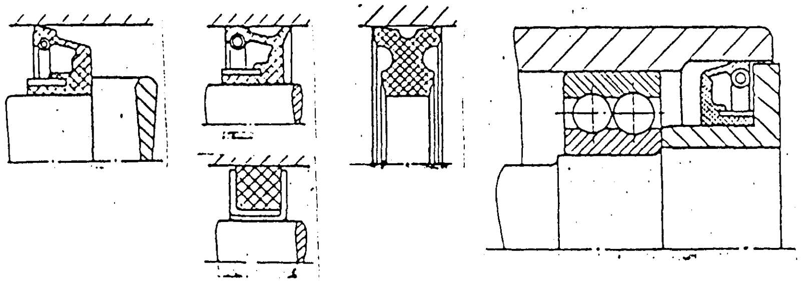
- radialno tesnenje navznoter (gredi , vretena)





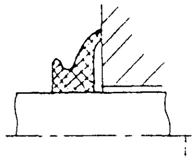
Načini montiranja

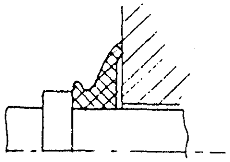
- radialno tesnenje navzven (bobni, obročki, tesnenje na ohišje)

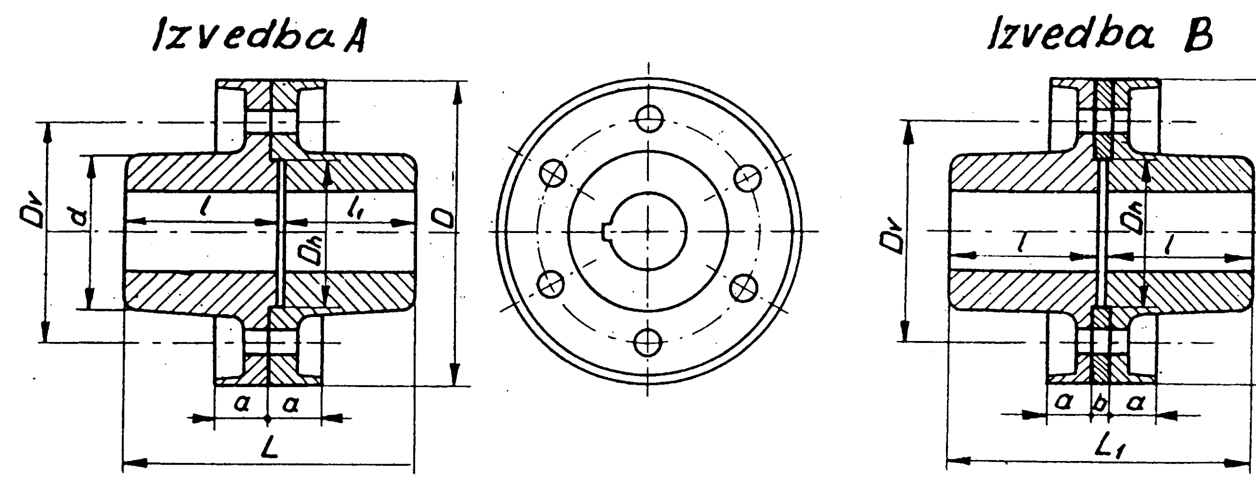


- aksialno tesnenje vrtečih gredi (gladko obročno tesnenje)

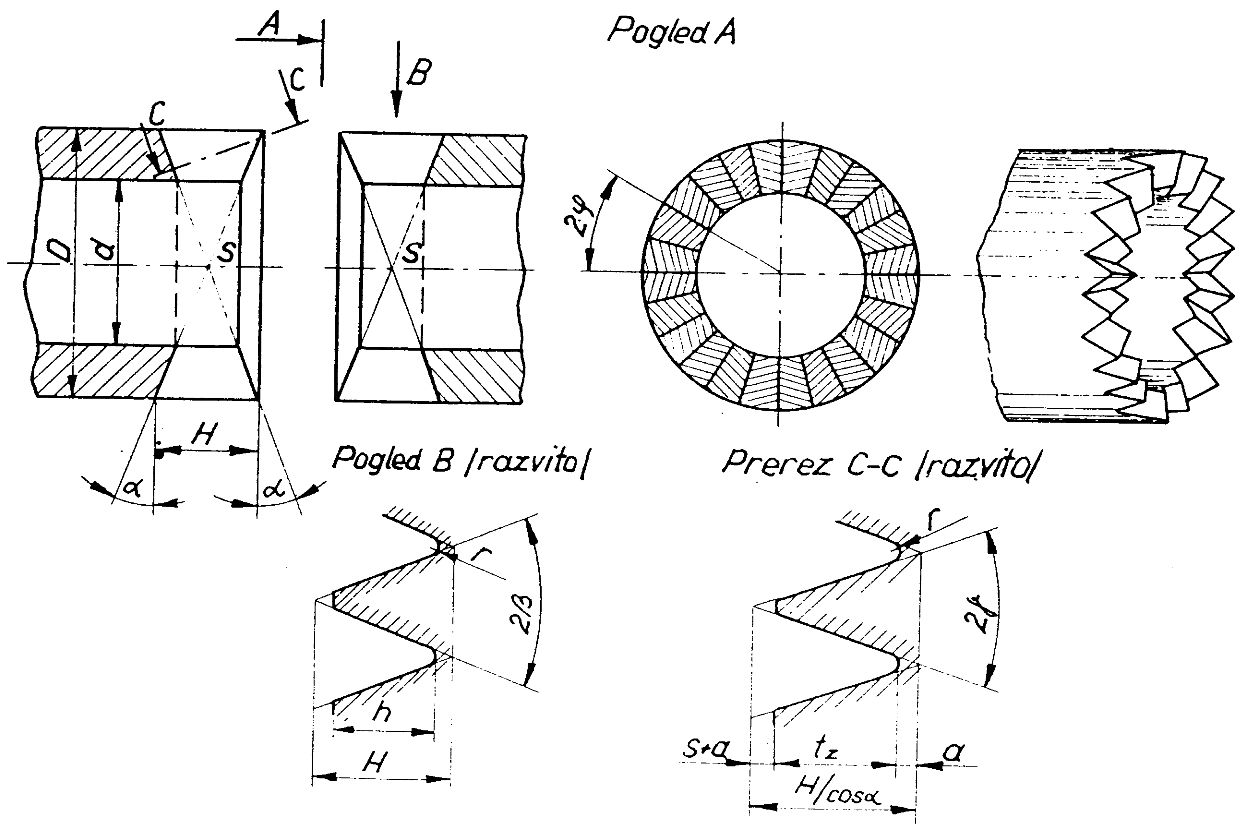
V-tesnila





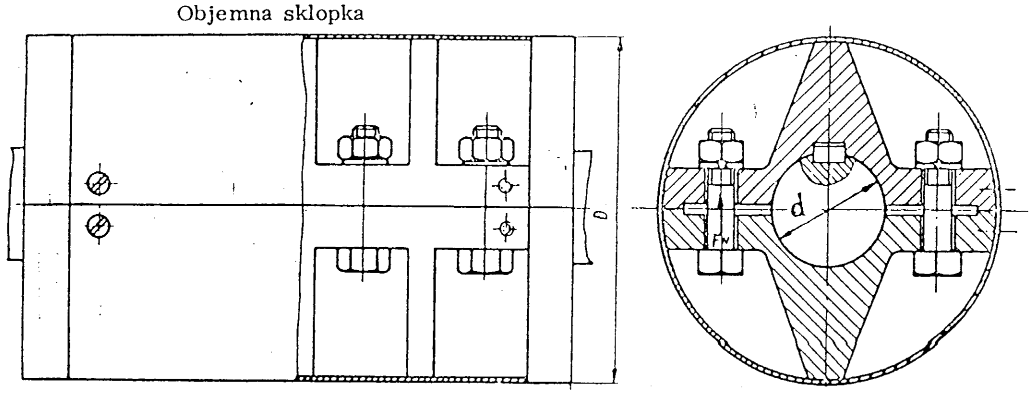


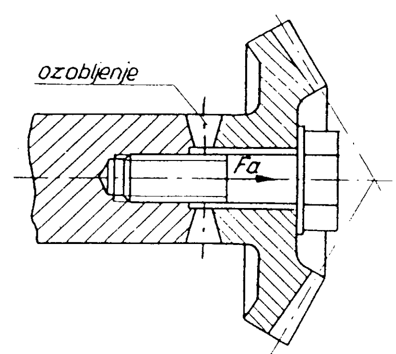
Slika 14.1



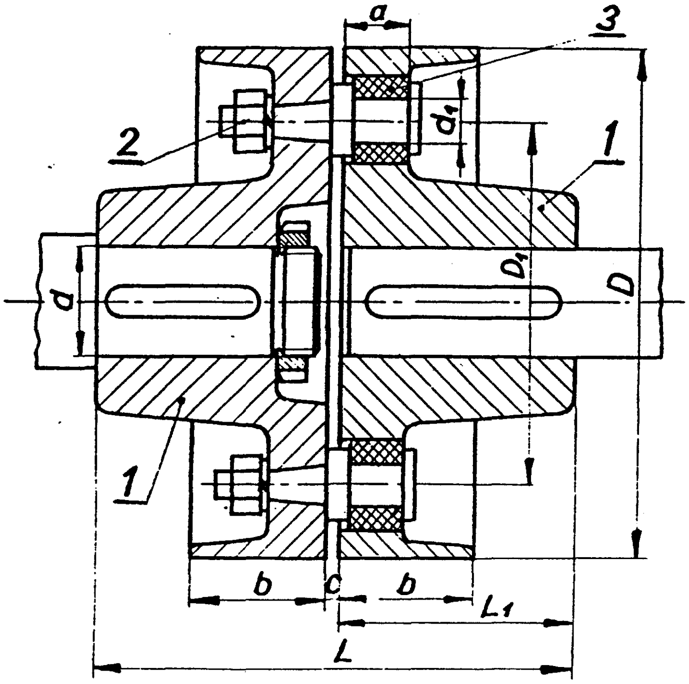
Slika 19.1

Objemna sklopka

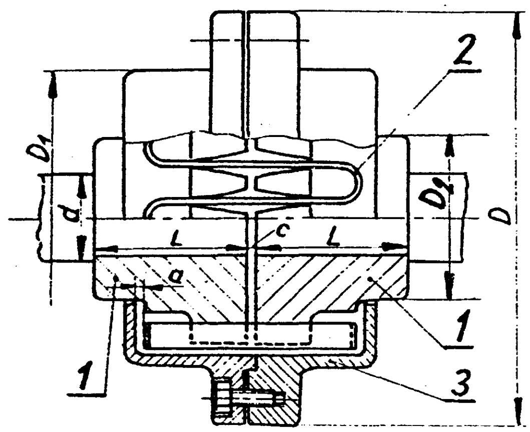




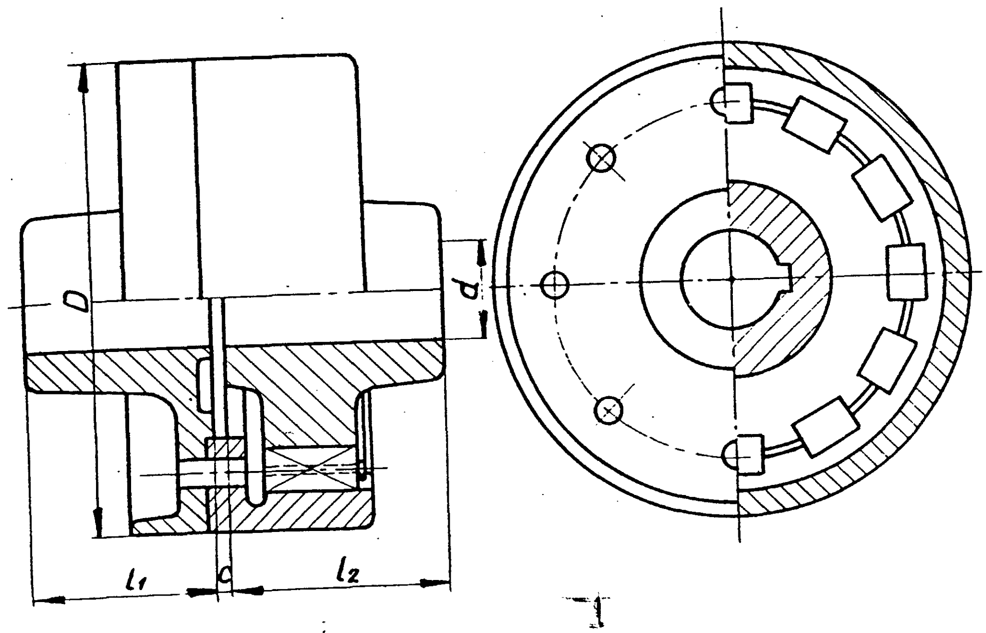
Slika 18.1



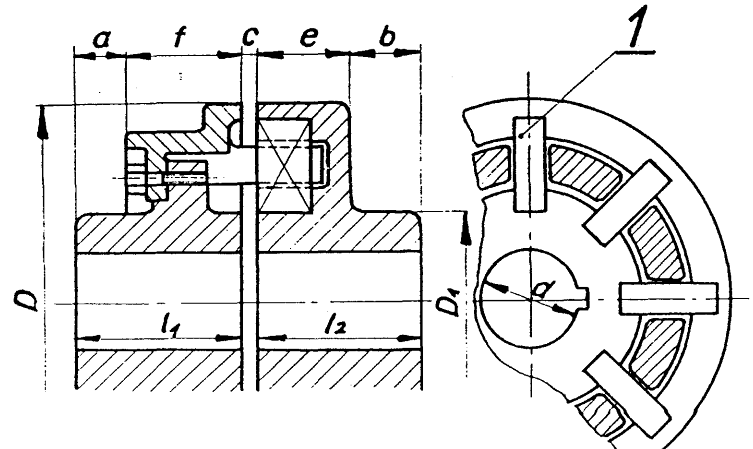
Slika 62.1



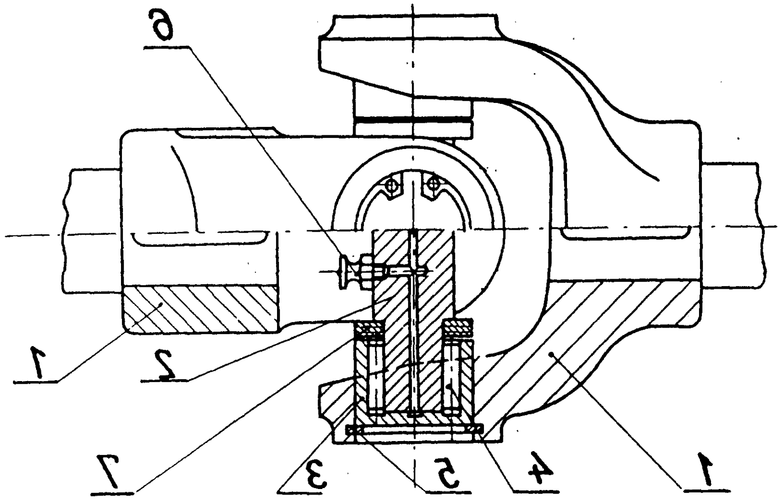
Slika 56.1



Slika 65.1



Slika 67.2



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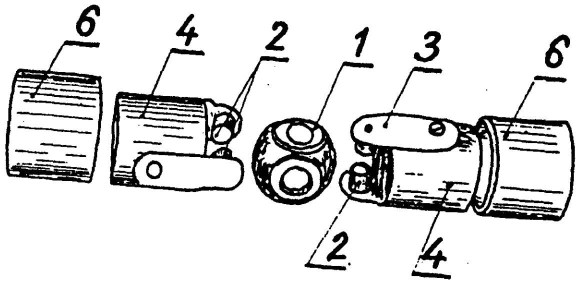
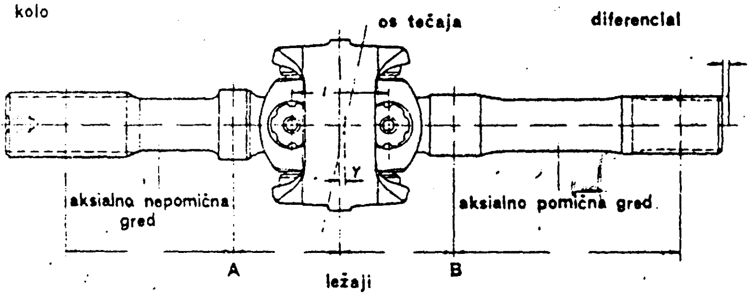
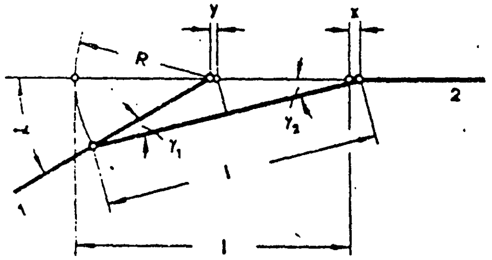


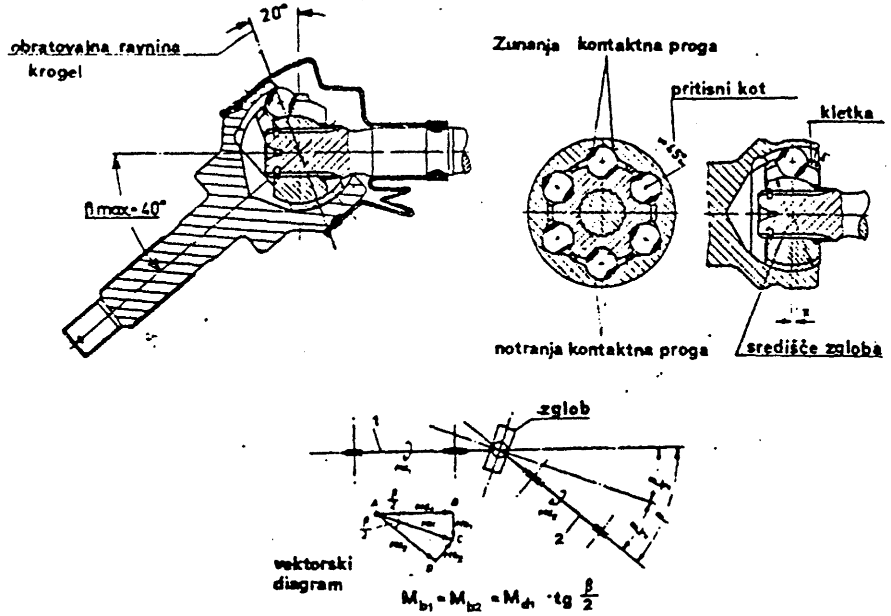
Slika 48.1



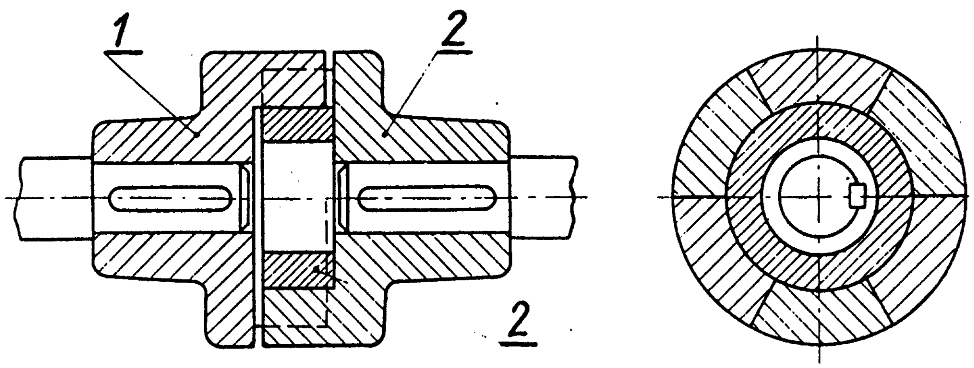
Sl. 5.09



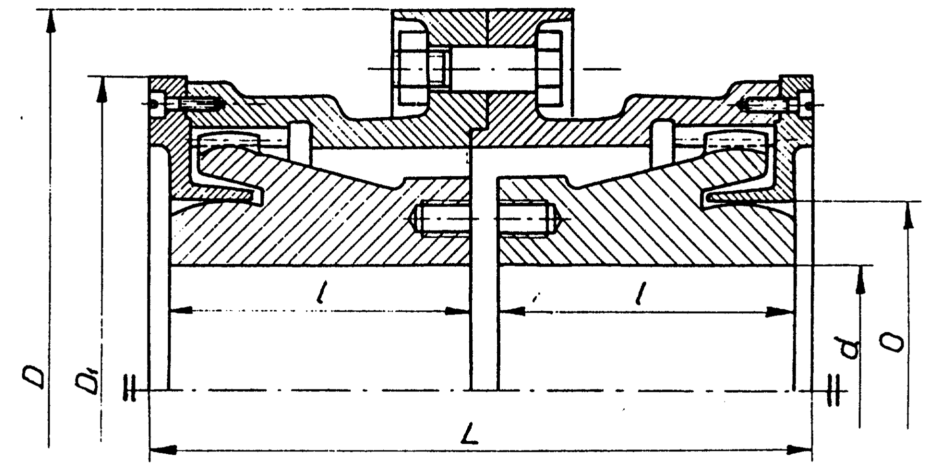
Sl. 5.10



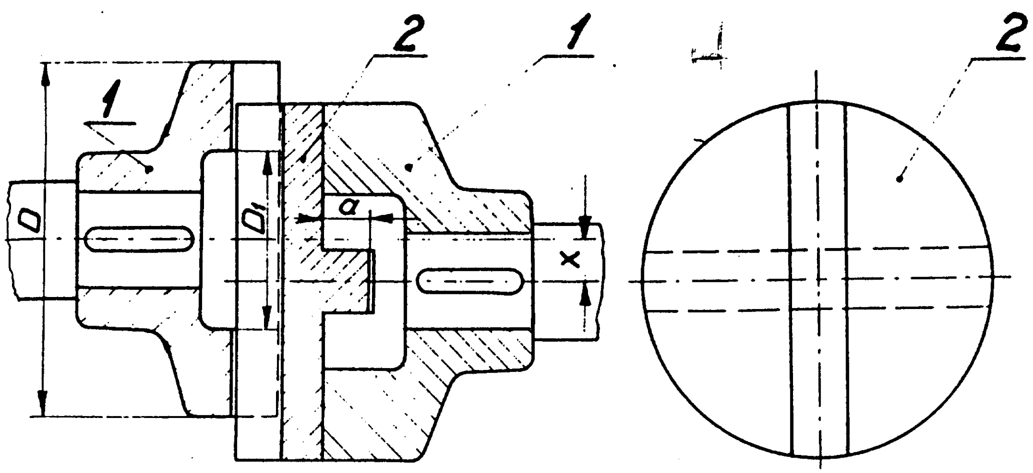
Sl. 5.08



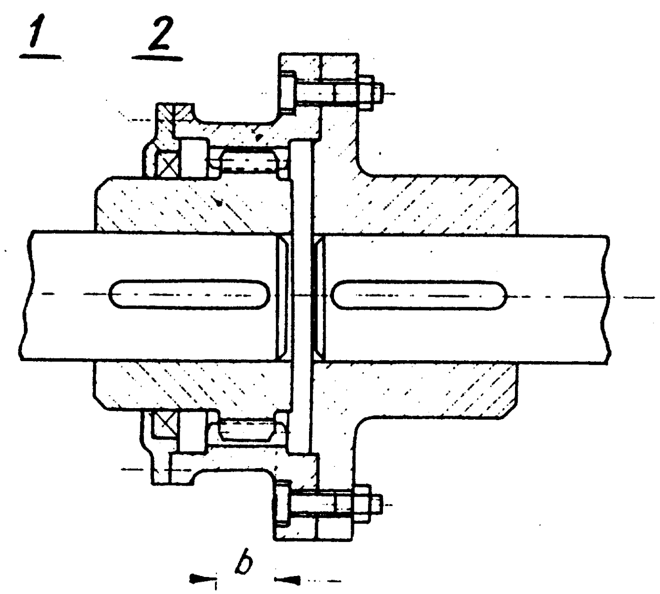
Slika 24.1



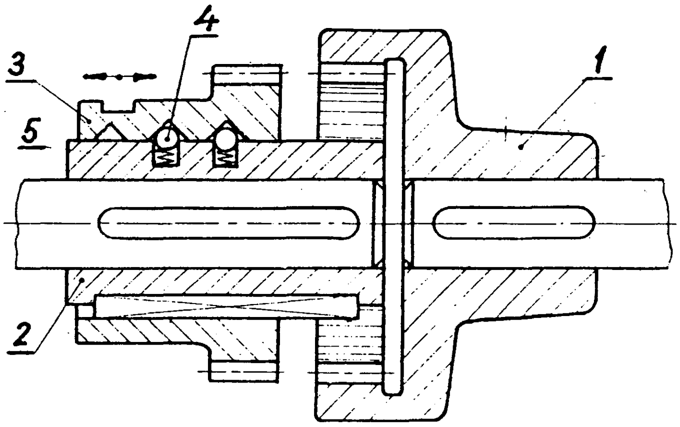
Slika 35.1



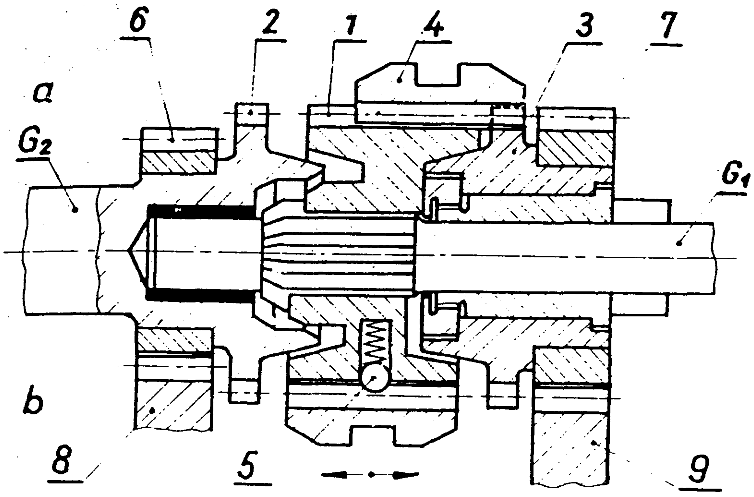
Slika 27.1



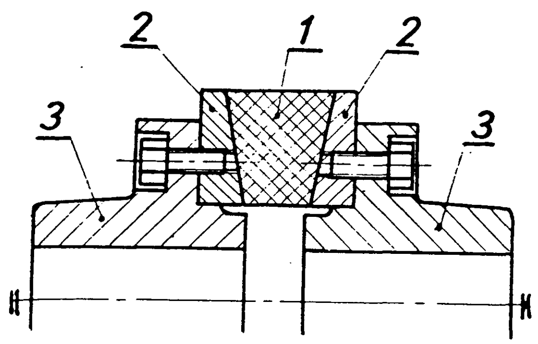
Slika 3o.1



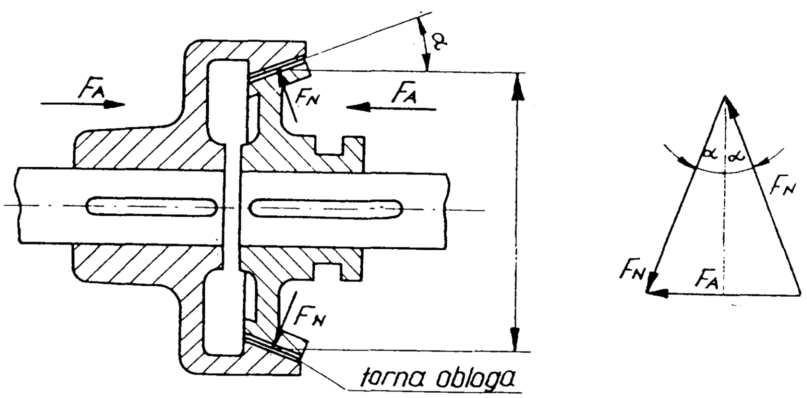
Slika 8o.1



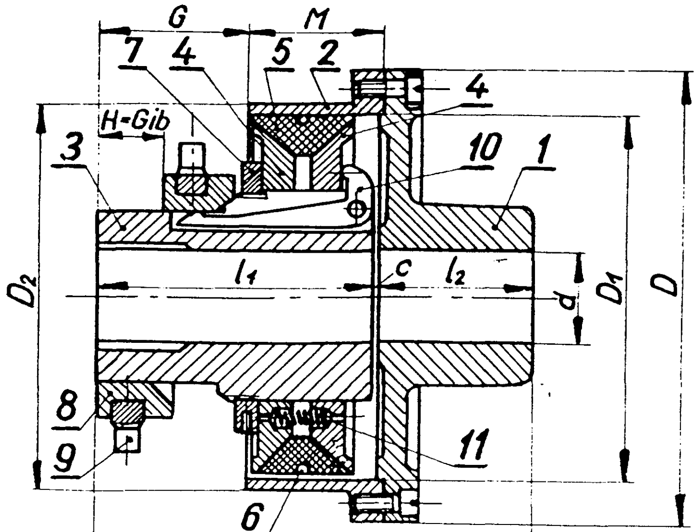
Slika 81.1



Slika 71.1

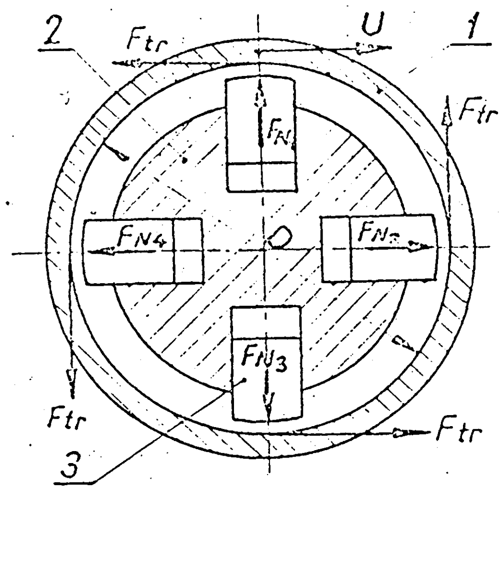


Slika 99.1

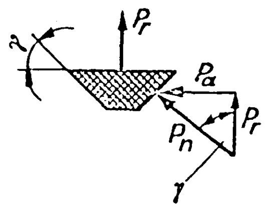


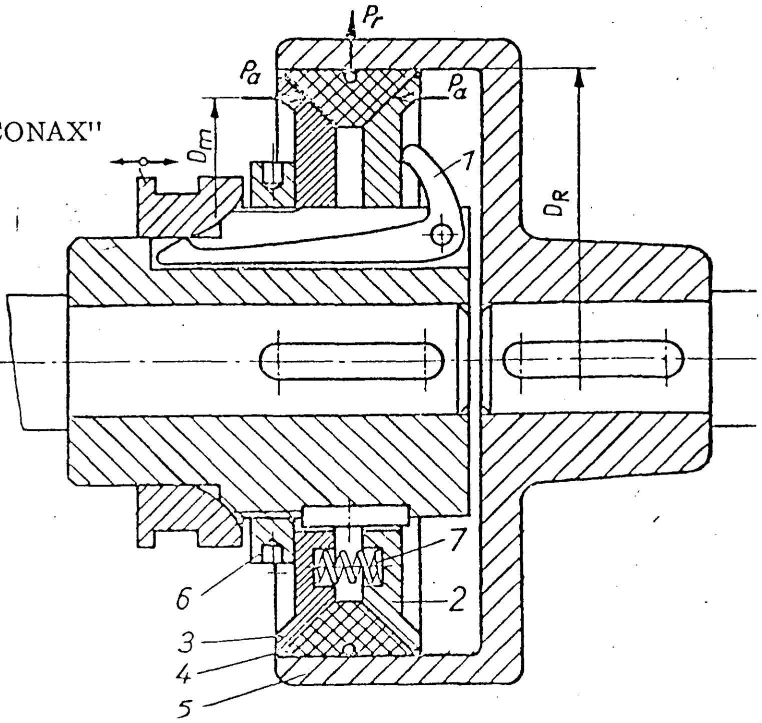
Slika lo2.1

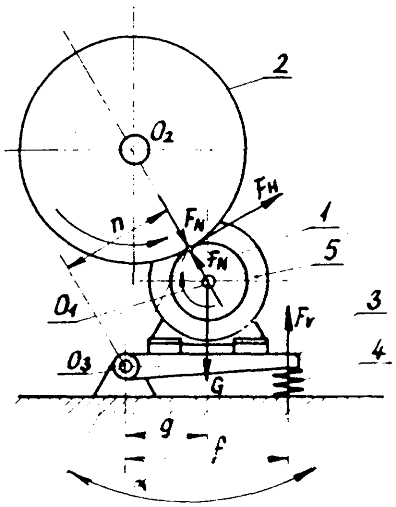
Čeljustna torna sklopka



Stožčasta torna sklopka "CONAX"

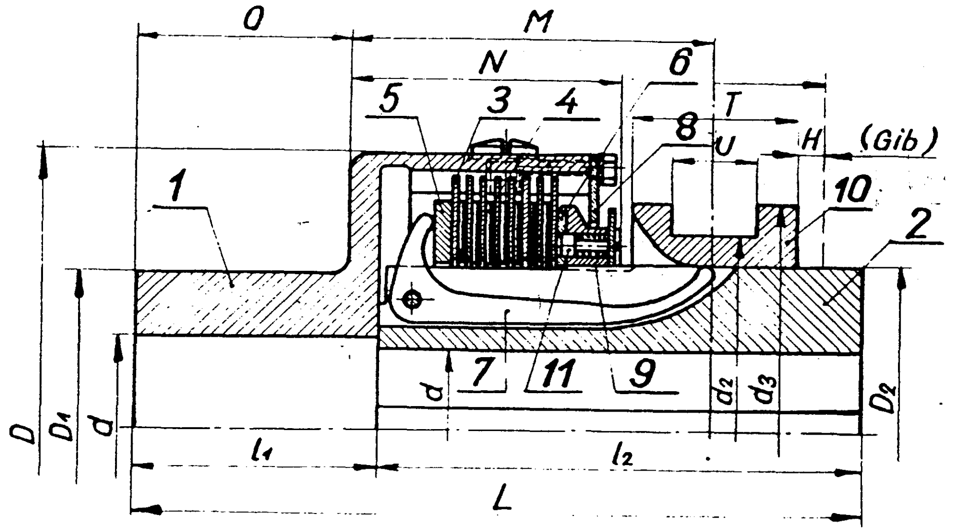




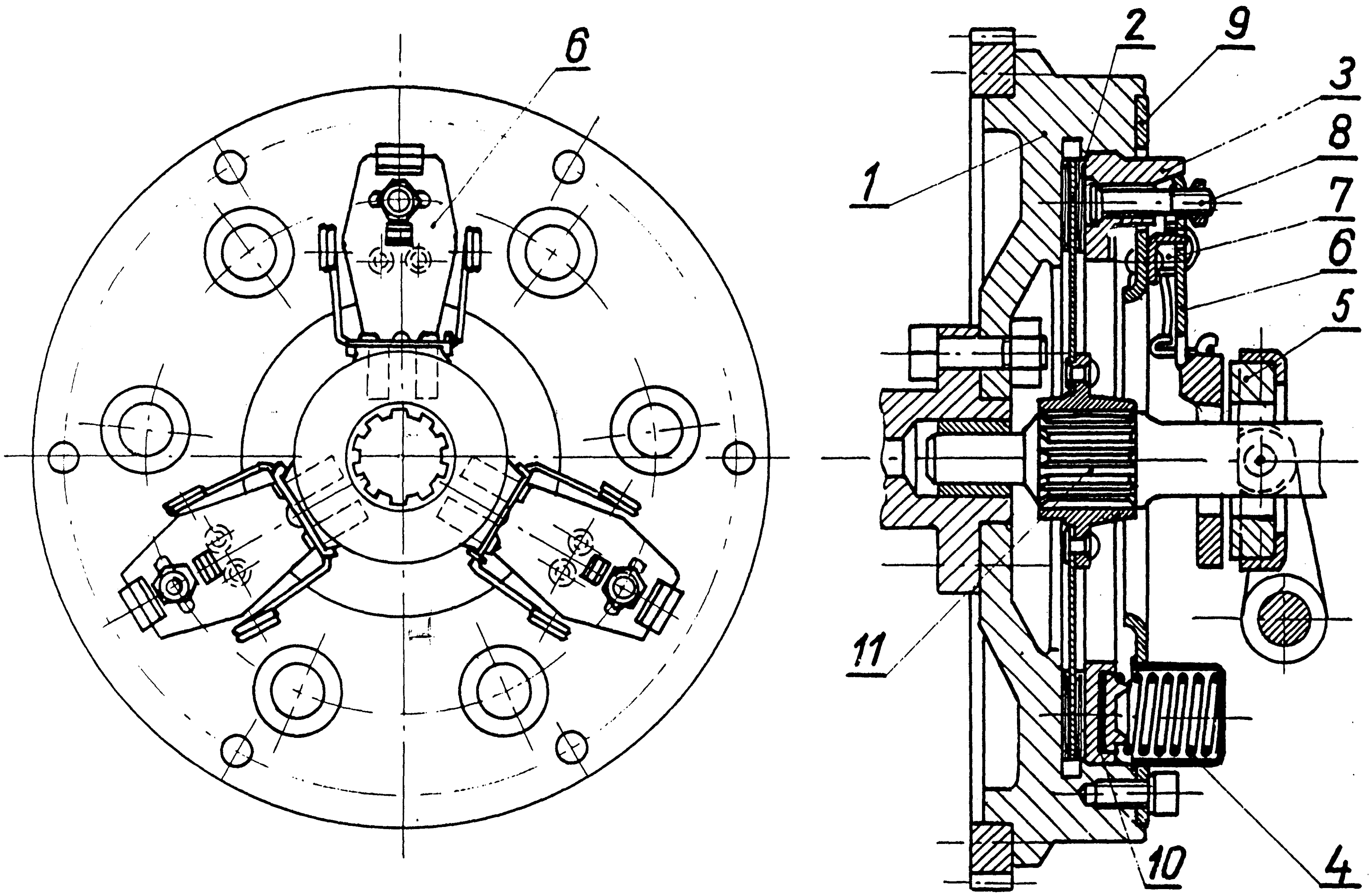


material	torni koeficient μ suho	mazano	p_{dop} kp/mm^2
SL/SL	0,15. . . 0. 25	0,02. . . 0,01	15. . . 2o
SL/Č	0,15. . . 0,2	0,03. . . 0.06	8. . . 14
KALJENO Č/Č	0,1	0,009	5. . . 20
sinter/kal. Č	0,15. . . 0,25	0,06. . . 0,11	
AZBEST/ Č,SL,ČL	0,2. . . 0,4	0,1. . . 0,15	0,5. . . 80
kovinska volna in guma/Č,SL	0,45. . . 0,65	0,1. . . 0,2	0,5. . . 60
grafit/Č	0,25	0,15. . 0,1	o,5. . . 20

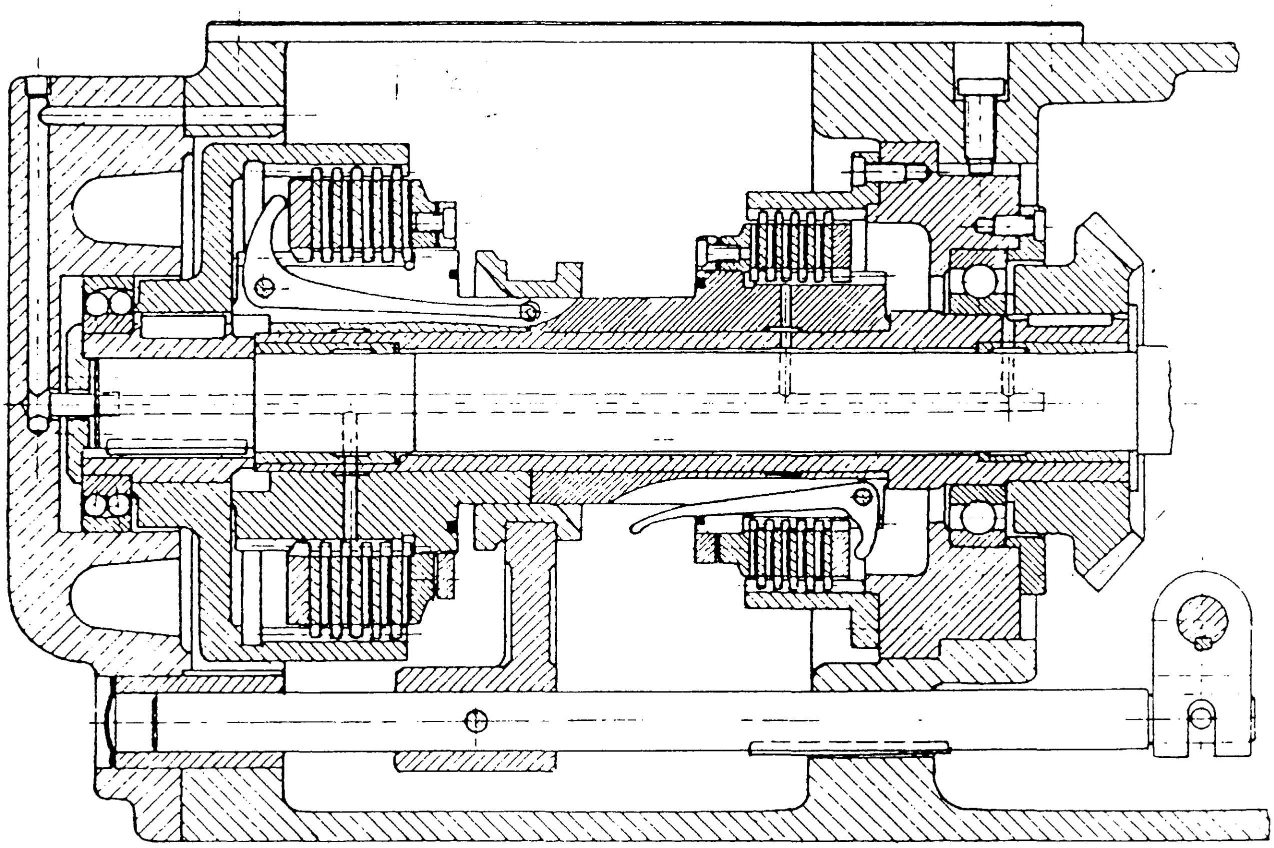
Slika 177.3



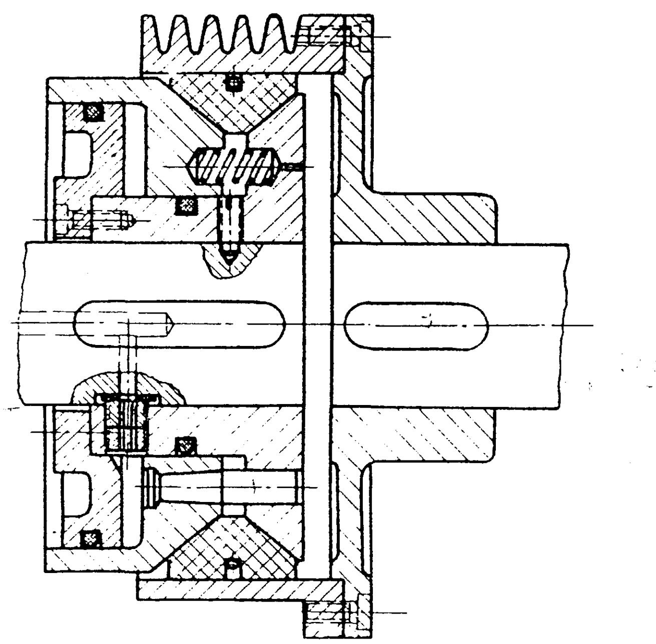
Slika 112.1



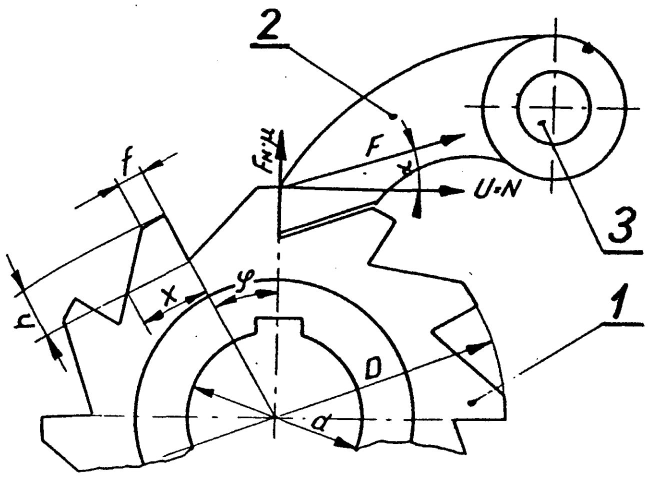
Slika 1o7.1



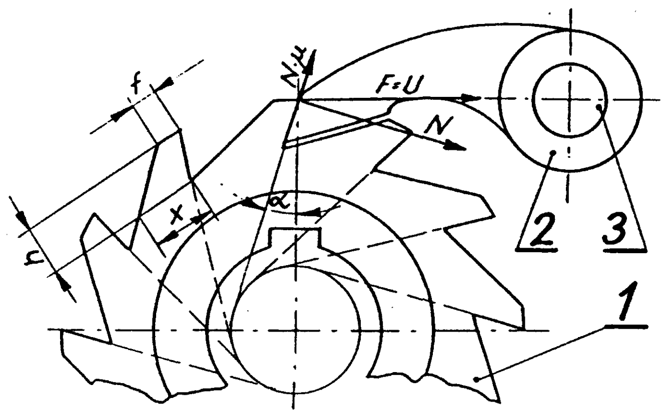
Slika 118.1



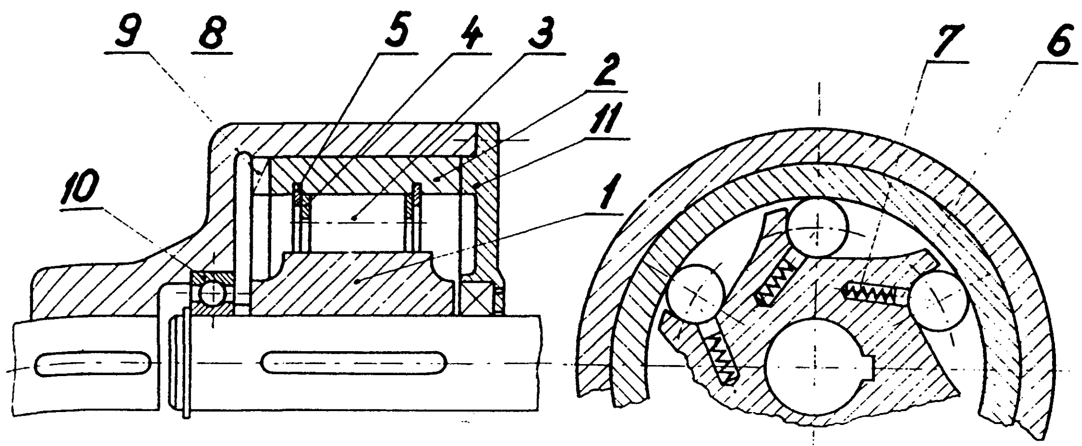
Slika 128.1



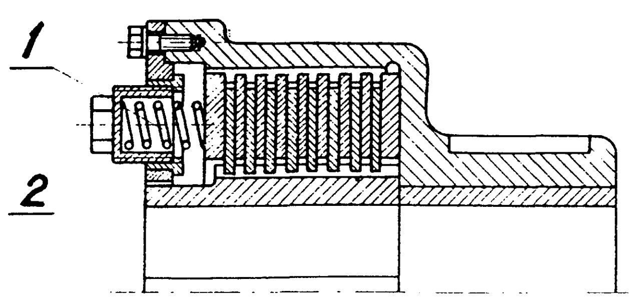
Slika 135.1



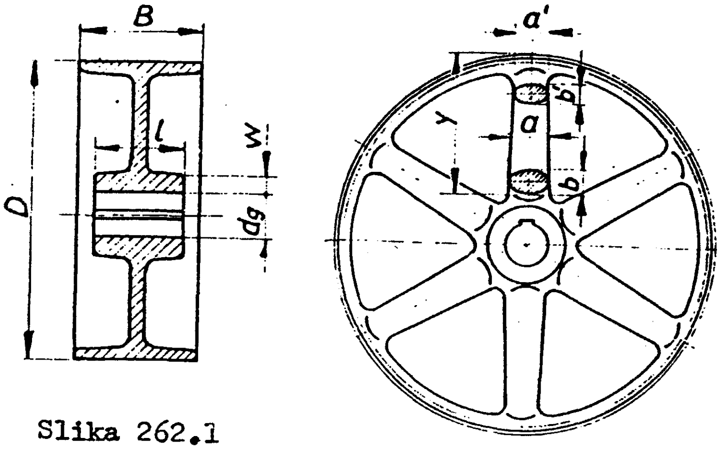
Slika 135.2



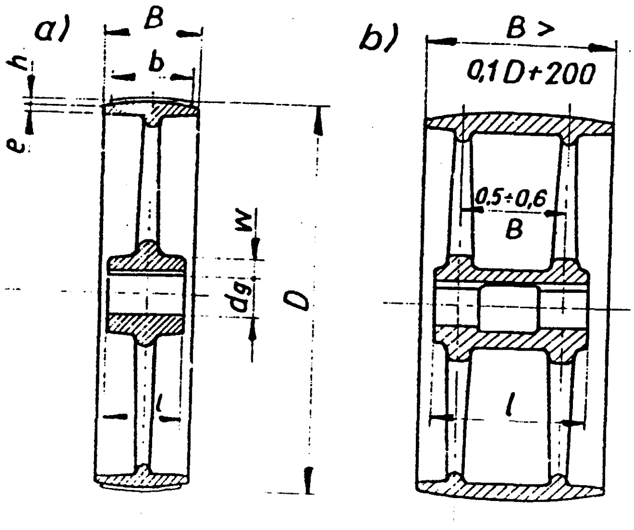
Slika 147.1



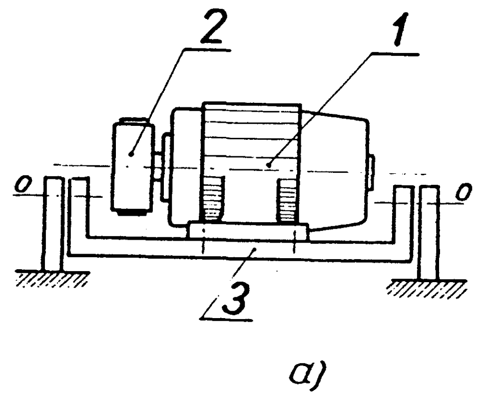
Slika 15o.2

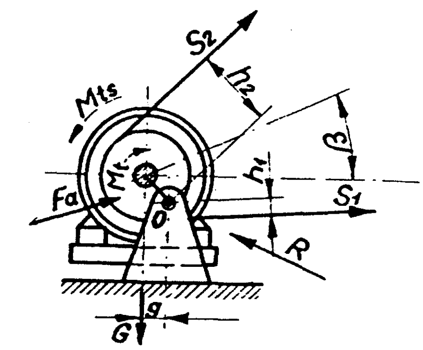


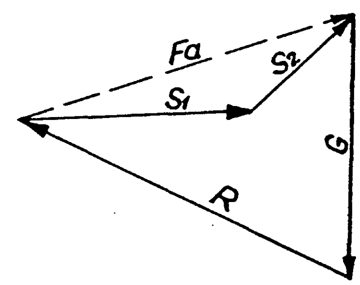
Slika 262.1



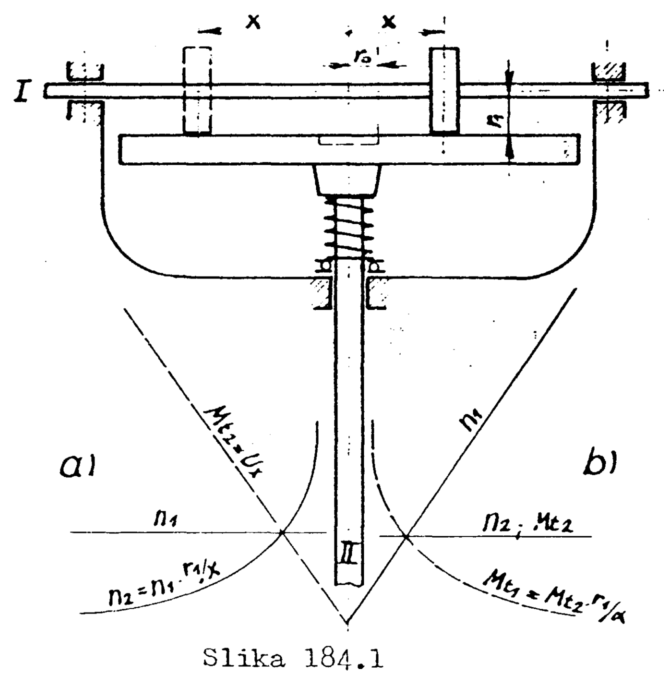
Slika 263.1



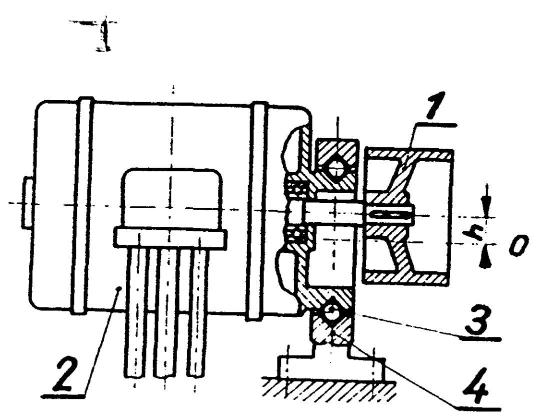




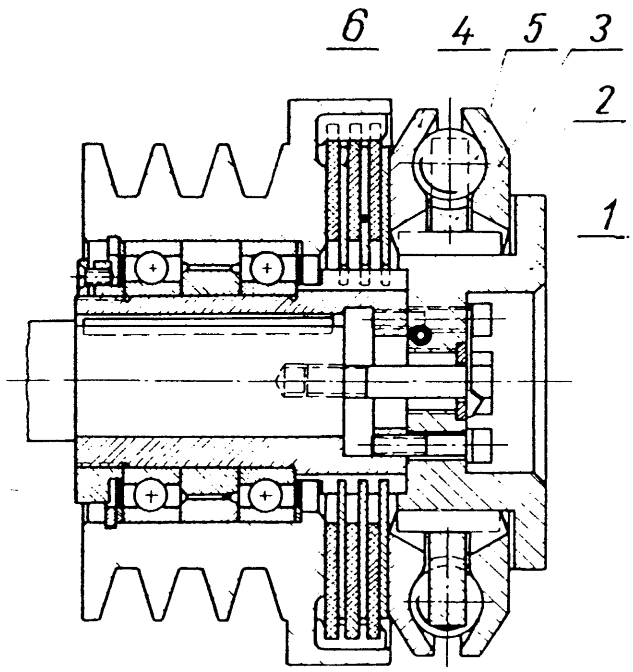
Slika 22o.1



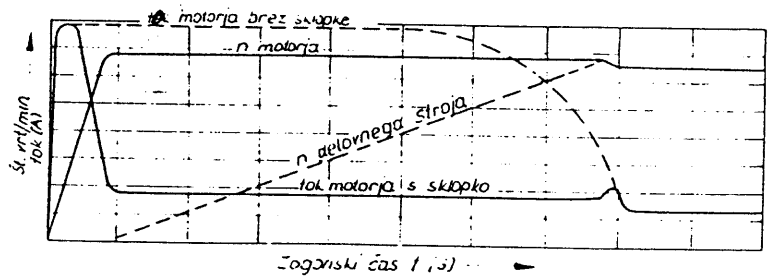
Slika 184.1



Slika 223.2



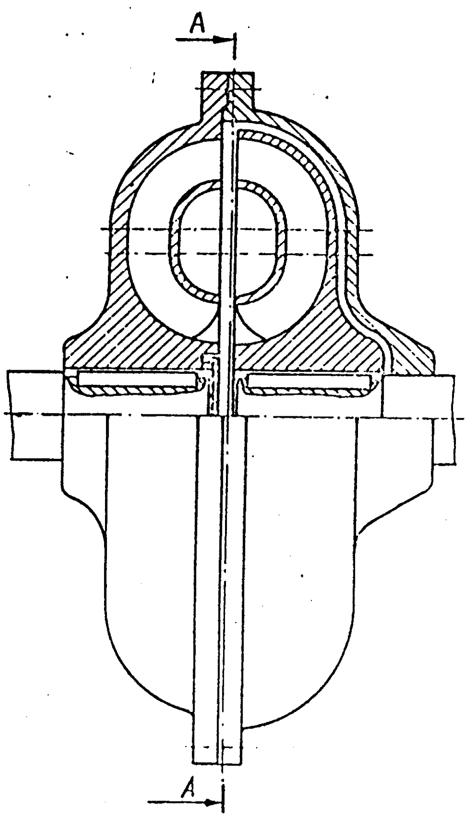
Slika 159.2



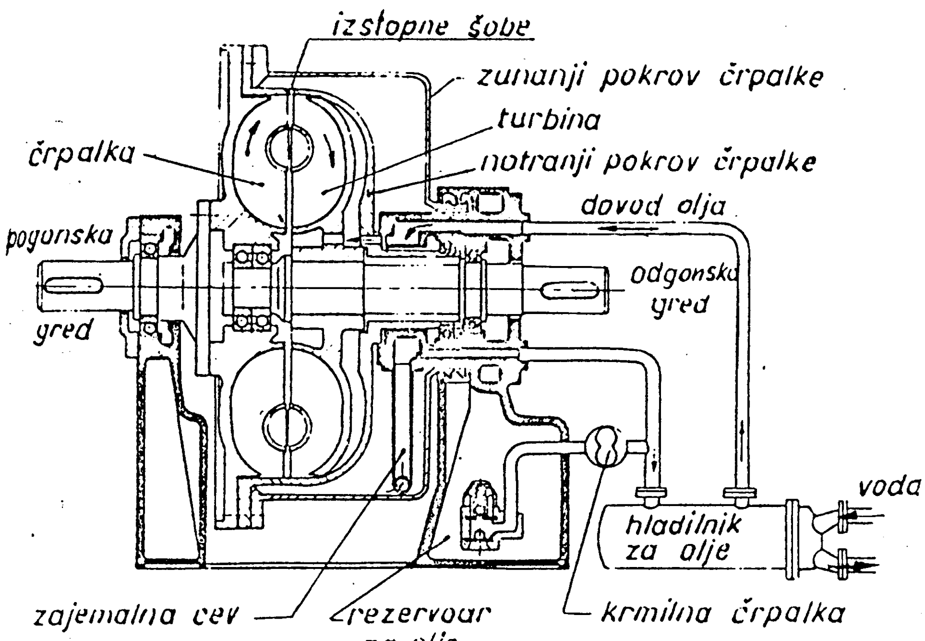
Slika 159.1

Hidravlične sklopke

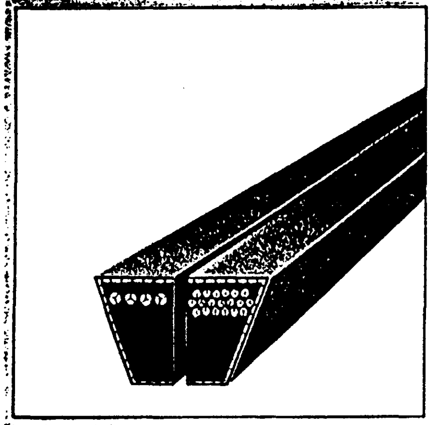
a. nekrmiljene



b. Krmiljene

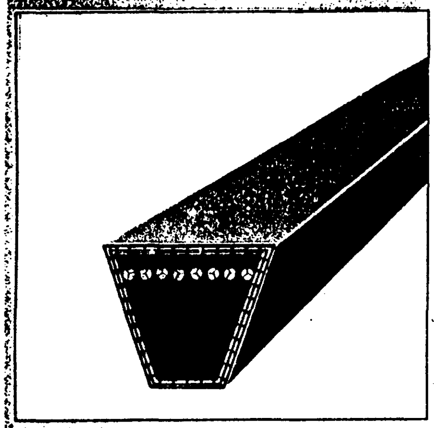


VEKTOVEL



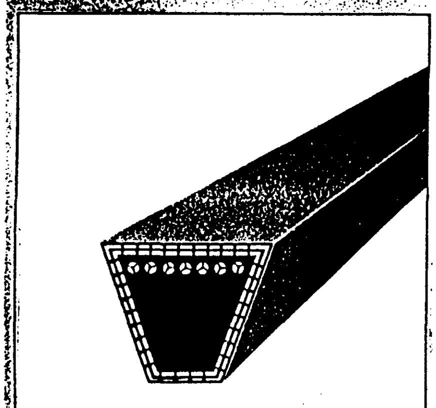
VEKTOVEL N

klasični obloženi klinasti remeni normalnog profila za laku mašinogradnju, lake mašine za obradu i poljoprivrednu mehanizaciju. Ali se takođe mogu koristiti za srednje i teške prenosnike u industriji. Varijante armature su kabelski kord in pramenski kord. Izrađujemo remene sa presekom od Z do D E. Remeni Z namenjeni su uglavnom za belu tehniku, a A, B, C in D za mašinogradnju i poljoprivrednu mehanizaciju. Remene izrađujemo u skladu standarda ISO 4184, DIN 2215, JUS G. E 2.053.



VEKTOVEL SP

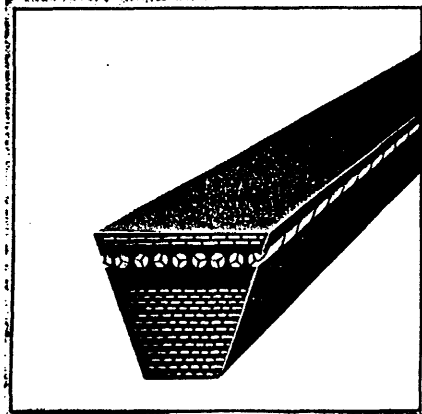
uzani obloženi klinasti remeni za prenose velikih opterećenja u industriji. Preseke od SPZ do SPC izrađujemo u skladu standarda ISO 4184, DIN 7753 i JUS G. E 2.063.



VEKTOVEL AV

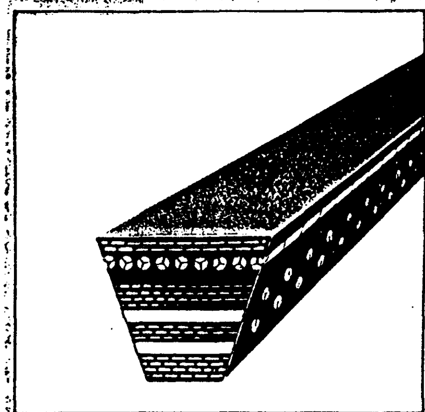
obloženi klinasti remeni preseka 9,5 in 12,5 (po DIN 7753/3) odn. AV 10 in AV 13 (po ISO 2790) za motorna vozila. To su remeni starije generacije za pogon ventilatora u manje zahtevnim uslovima rada. Izrađujemo remene u dužini od 600 do 1000 mm.

DURAVEL



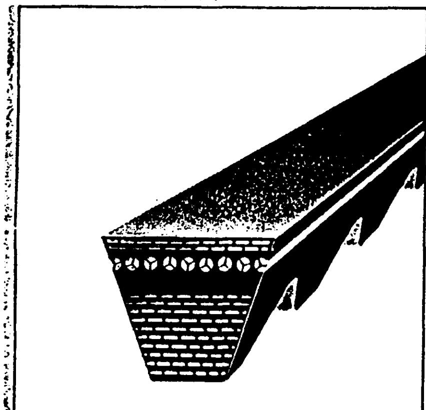
Izrađujemo DURAVEL — uzane klinaste remene sa nasečenom ivicom i presecima AV 10 i AV 13.

DURAV[illegible]



varijanta sa poboljšanim osobinama. Dodatnim umecima povećana je poprečna krutost, što je pogodno za veće prenose.

DURAVEL [illegible] (DURAVEL N)



varijanta sa poboljšanom fleksibilnošću. Unutrašnje ozupčenje omogućava upotrebu remenice manjeg prečnika. Ovi remeni su veoma izdržljivi i prikladni prvenstveno za veće prenose.

DURAVEL su uzani klinasti remeni sa nasečenom ivicom za pogon pomoćnih agregata u motornim vozilima (alternatora, ventilatora, pumpi za vodu) i ostalih mašina i uređaja.

Prednost Duravel klinastih remena sa sečenom ivicom u poređenju sa običnim klinastim remenima su:
- do dva puta duži vek,
- dvadeset do trideset procenata veći prenos snage,
- veća otpornost na klizanje i habanje,
- otpornost na ulja, ozon i povišenu temperaturu,
- ravnomeran i tih pogon.

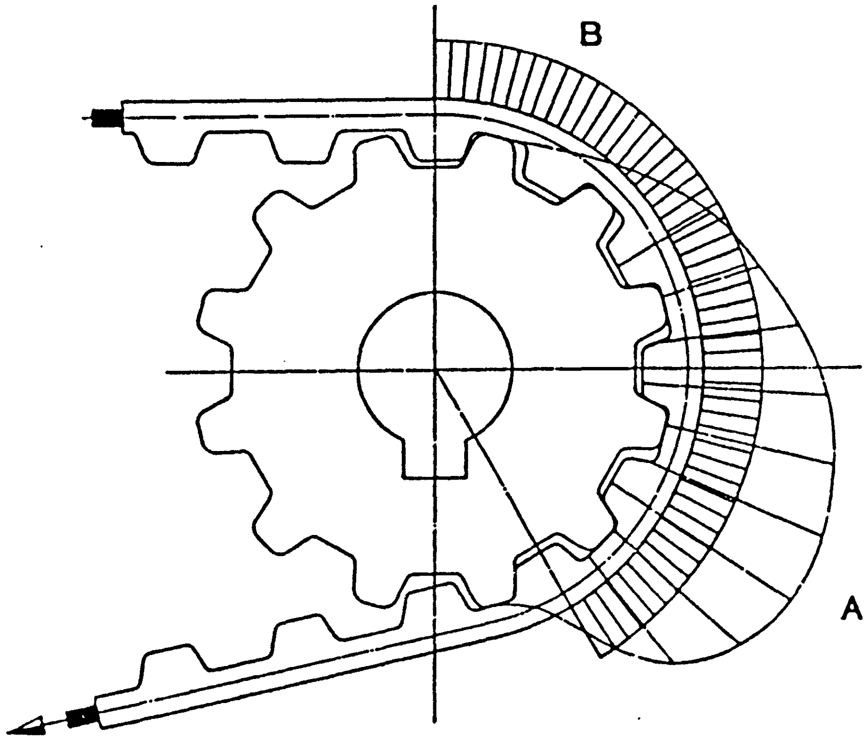
Dimenzije Duravel klinastih remena Sava Kranj odgovaraju većini putničkih motornih vozila i mnogim teretnim vozilima i autobusima. Izrađujemo ih u skladu ISO 2790. Remene izrađujemo u dužini od 670 do 1600 mm.

Eigenschaften der Synchroflex- Zahnriemen-Antriebe

Synchroner Lauf
Wartungsfrei
Keine Nachdehnung
Hohe Flexibilität
Geringe Vorspannung
Geringe Lagerbelastung
Wirkungsgrad bis 99 %
Riemengeschwindigkeit bis 80 m sec^{-1}
Biegewechselfeste, dehnungsarme
Stahlzugstränge
Hohe Lebensdauer
Doppelverzahnung
auf beiden Seiten voll belastbar

Kleine Baumaße
Große Achsabstände
Geschränkt einsetzbar
Große Übersetzungen ausführbar
Feste Achsabstände möglich (Rückfrage)
Winkelgetreue Übertragung
Günstiges Leistungsgewicht

Ölbeständig
Tropenbeständig
Temperaturbereich
von – 30 °C bis + 80 °C
(kurzzeitig bis 120 °C)
Hohe Abriebfestigkeit
Bedingt beständig
gegen Säuren und Laugen

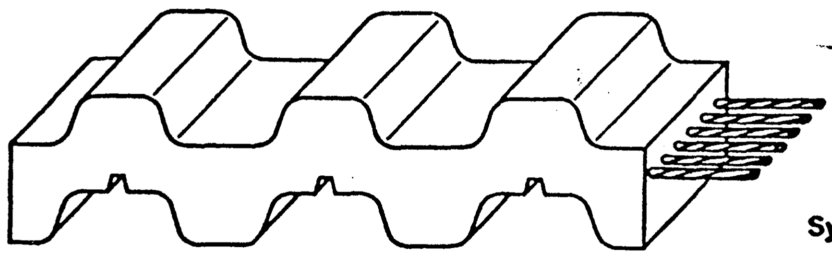


Eingriffsverhältnisse des Synchroflex-Zahnriemens am kleinen Zahnrad

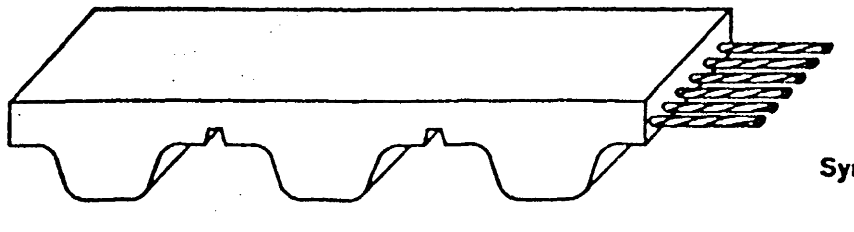
(A) Tatsächliche Spannungsverteilung des Zahneingriffs über die Umschlingung

(B) Rechnerische Spannungsverteilung bei Flächengleichheit (A) = (B)

Aufbau des Synchroflex-Zahnriemens

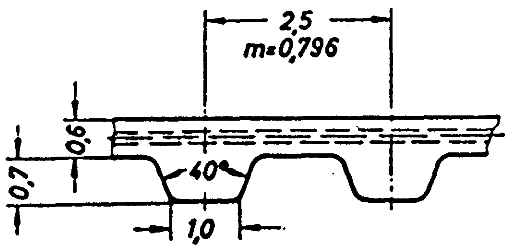


Synchroflex-Zahnriemen doppelt verzahnt



Synchroflex-Zahnriemen einfach verzahnt

Synchroflex-Zahnriemen



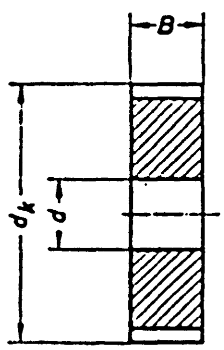
Bestellbeispiel

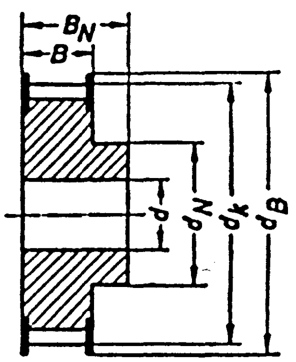
10	T 2,5/380
Breite	Type/Länge

Type	Riemen-länge mm	Zähne-zahl
T 2,5/120	120,00	48
T 2,5/160	160,00	64
T 2,5/200	200,00	80
T 2,5/245	245,00	98
T 2,5/265	265,00	106
T 2,5/285	285,00	114
T 2,5/330	330,00	132
T 2,5/380	380,00	152
T 2,5/420	420,00	168
T 2,5/480	480,00	192
T 2,5/500	500,00	200
T 2,5/600 FA	600,00	240
T 2,5/650	650,00	260
T 2,5/780	780,00	312

FA = mit verstärktem Rücken

Synchroflex-Zahnräder T 2,5





Bestellbeispiel

14	T 2,5/38	—	2
Breite	Type/Zähnezahl	—	Bordscheiben

(Seite 32)
Lagerräder Seite 33

z	d_k mm	d_{max} mm	d_B mm	z	d_k mm	d_{max} mm	d_B mm
12	9,00	3	12	42	32,90	24	36
13	9,80	3,5	13	43	33,70	24	37
14	10,60	4	14	44	34,50	25	38
15	11,40	5	15	45	35,30	26	39
16	12,20	6	16	46	36,10	27	39
17	13,00	7	16	47	36,90	27	40
18	13,80	7	17	48	37,70	27	41
19	14,60	8	18	49	38,45	28	42
20	15,40	9	19	50	39,25	29	43
21	16,20	10	20	51	40,05	30	43
22	17,00	10	20	52	40,85	30	44
23	17,80	11	21	53	41,65	30	45
24	18,55	11	22	54	42,45	31	46
25	19,35	12	23	55	43,25	32	47
26	20,15	13	23	56	44,05	32	47
27	20,95	13	24	57	44,85	32	48
28	21,75	13	25	58	45,65	33	49
29	22,55	14	26	59	46,45	34	50
30	23,35	15	27	60	47,25	35	51
31	24,15	16	27	61	48,05	36	51
32	24,95	16	28	62	48,85	37	52
33	25,75	17	29	63	49,60	37	53
34	26,55	17	30	64	50,40	37	54
35	27,35	20	31	65	51,20	38	55
36	28,10	20	31	66	52,00	38	55
37	28,90	21	32	67	52,80	39	56
38	29,70	21	33	68	53,60	39	57
39	30,50	22	34	69	54,40	40	58
40	31,30	23	35	70	55,20	41	59
41	32,10	24	35	71	56,00	42	59

d_{max} = max. Bohrung für Räder mit Bordscheiben

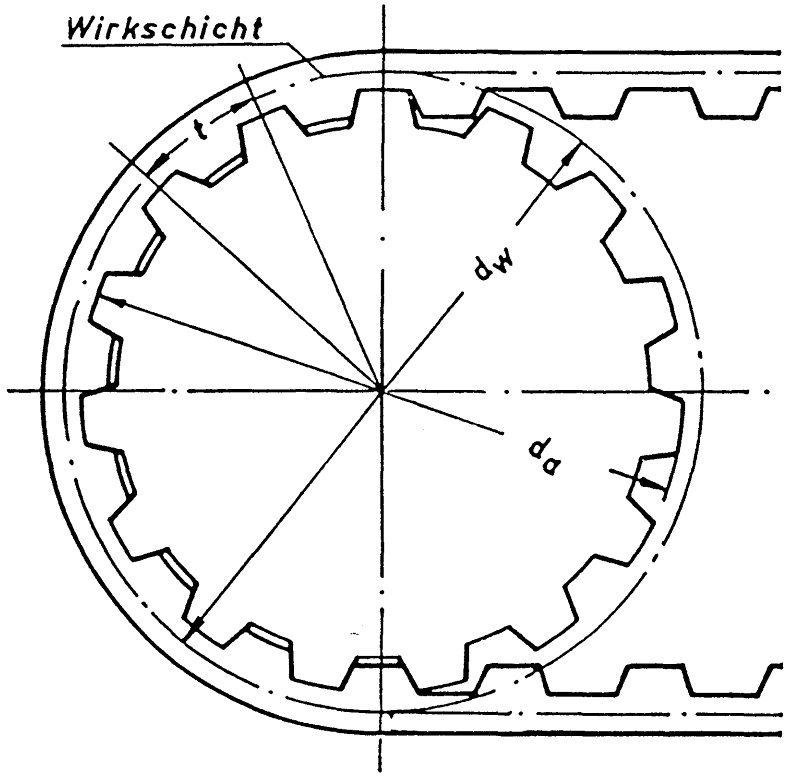
Riemennormbreite b mm	4	6	10
Radbreite B mm	8	10	14

Zahnteilungen

OPTIBELT-ZR Zahnflachriemen und Scheiben werden in fünf Standard-Zahnteilungen hergestellt:

Teilung 1/5" ≙ 5,08 mm, Type XL
Teilung 3/8" ≙ 9,525 mm, Type L
Teilung 1/2" ≙ 12,7 mm, Type H
Teilung 7/8" ≙ 22,225 mm, Type XH
Teilung 1 1/4" ≙ 31,75 mm, Type XXH

Die Zahnteilung ist beim Riemen der Abstand von Mitte Zahn zu Mitte Zahn in Höhe der Wirkschicht gemessen, die der Lage des Zugstrangs entspricht. Bei der Zahnscheibe ist der Wirkdurchmesser eine theoretische Größe, die außerhalb des Außendurchmessers liegt.



Aus dem Riemencode, mit dem alle Standardriemen versehen sind, lassen sich die wichtigsten Abmessungen ableiten:

Wirklänge (in Zoll)
Teilung (in Buchstaben)
Riemenbreite (in Zoll)

Beispiel: Zahnflachriemen 225 L 075

225 — 22,5" Wirklänge
L — Teilung 3/8", Type L
075 — 3/4" Riemenbreite

Aus dem Code, mit dem alle Standard-Zahnscheiben versehen sind, lassen sich die wichtigsten Daten ableiten:

Zähnezahl
Teilung
Riemenbreite

Beispiel: Zahnscheibe 20 L 075

20 — Anzahl der Zähne (d_w = 60,63 mm, d_a = 59,95 mm)

L — Teilung 3/8", Type L

075 — Scheibenbreite für Zahnflachriemen mit 3/4" Breite

Zahnmaße, Toleranzen

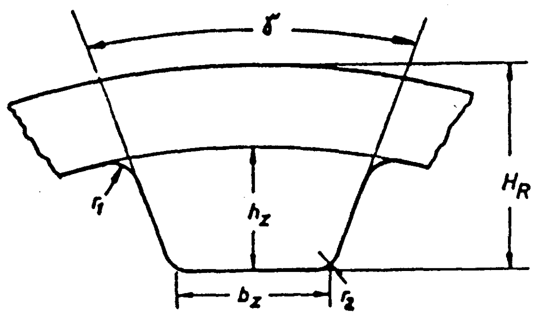


Tabelle 1a

	XL	L	H	XH	XXH
Zahnwinkel x	50	40	40	40	40
Zahnlückentiefe h_2	1,27	1,90	2,29	6,35	9,53
Kopfradius r_1	0,38	0,51	1,02	1,57	2,29
Fußradius r_2	0,38	0,51	1,02	1,19	1,52
Zahnbreite b_z	1,37	3,25	4,43	7,94	12,12
Gesamt Riemenstärke H_R	2,38	3,17	4,76	11,12	15,87

Breiten-Toleranzen (mm) für OPTIBELT-ZR Zahnflachriemen

Tabelle 1b

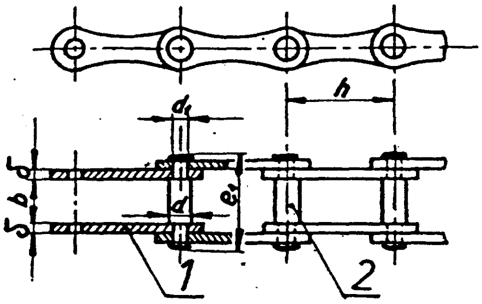
Breiten der Zahnflachriemen	Längen der Zahnflachriemen mm bis 838	 839 bis 1676	 über 1676
über 1/8" ≙ 3,17 mm bis 7/16" ≙ 11,1 mm	+ 0,4 − 0,8	+ 0,4 − 0,8	
über 7/16" ≙ 11,1 mm bis 1 1/2" ≙ 38,1 mm	+ 0,8 − 0,8	+ 0,8 − 1,2	+ 0,8 − 1,2
über 1 1/2" ≙ 38,1 mm bis 2" ≙ 50,8 mm	+ 0,8 − 1,2	+ 1,2 − 1,2	+ 1,2 − 1,6
über 2" ≙ 50,8 mm bis 2 1/2" ≙ 63,5 mm	+ 1,2 − 1,2	+ 1,2 − 1,6	+ 1,6 − 1,6
über 2 1/2" ≙ 63,5 mm bis 3" ≙ 76,2 mm	+ 1,2 − 1,6	+ 1,6 − 1,6	+ 1,6 − 2,0
über 3" ≙ 76,2 mm bis 4" ≙ 101,6 mm	+ 1,6 − 1,6	+ 1,6 − 2,0	+ 2,0 − 2,0
über 4" ≙ 101,6 mm	+ 2,4 − 2,4	+ 2,4 − 2,8	+ 2,4 − 3,2

Längen-Toleranzen (mm) für OPTIBELT-ZR Zahnflachriemen

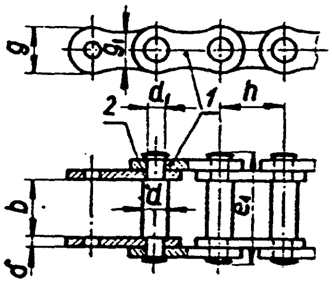
Tabelle 2

von 127 mm bis 254 mm	von 255 bis 381	von 382 bis 508	von 509 bis 762	von 763 bis 1016	von 1017 bis 1270	von 1271 bis 1524	von 1525 bis 1778
± 0,20 mm	± 0,23	± 0,25	± 0,30	± 0,33	± 0,38	± 0,41	± 0,43

Für jede weitere 25,4 mm Länge sind 0,0254 mm zuzurechnen!



Sl. 7.1



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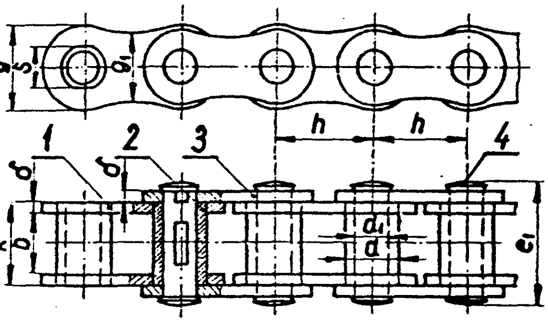

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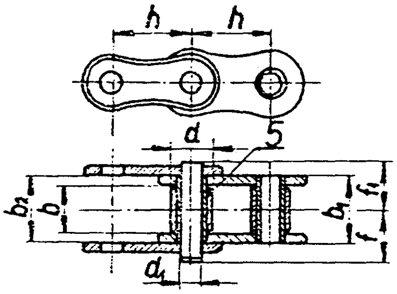
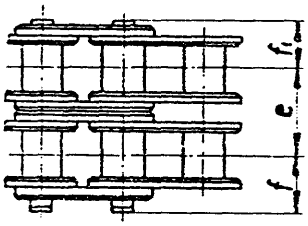
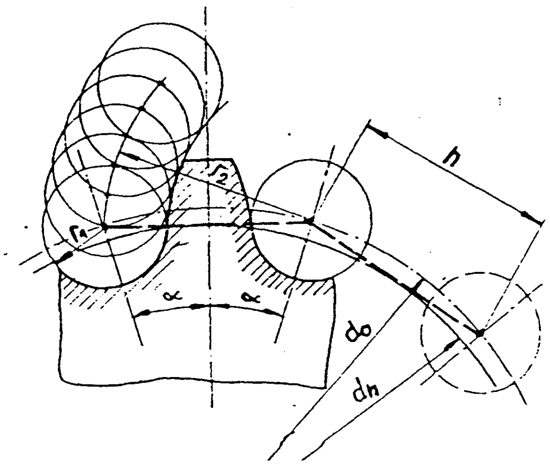


Sl. 1o.1



Sl. 1o.2



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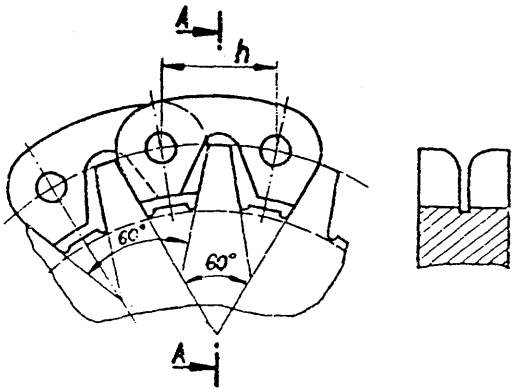

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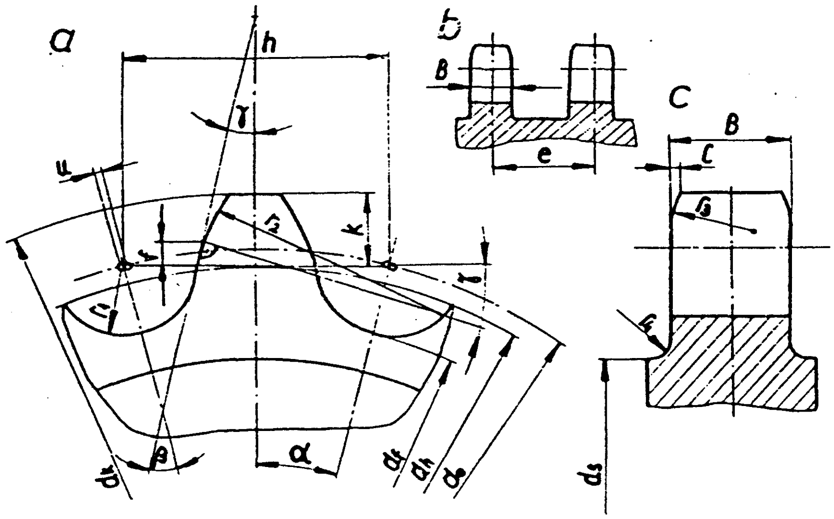

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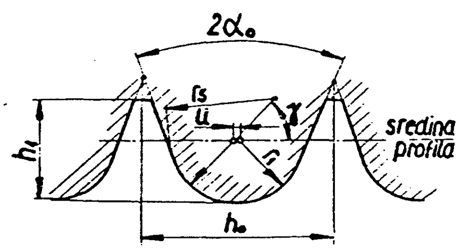

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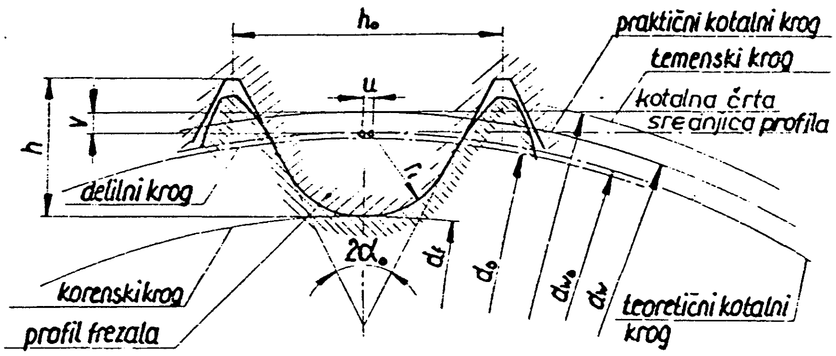
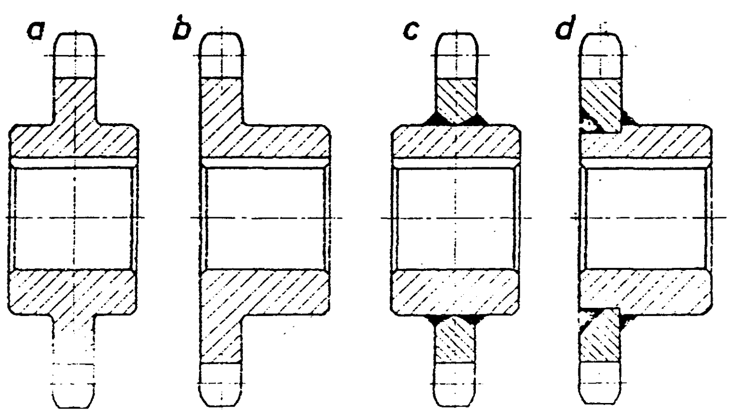


Sl. 25.2



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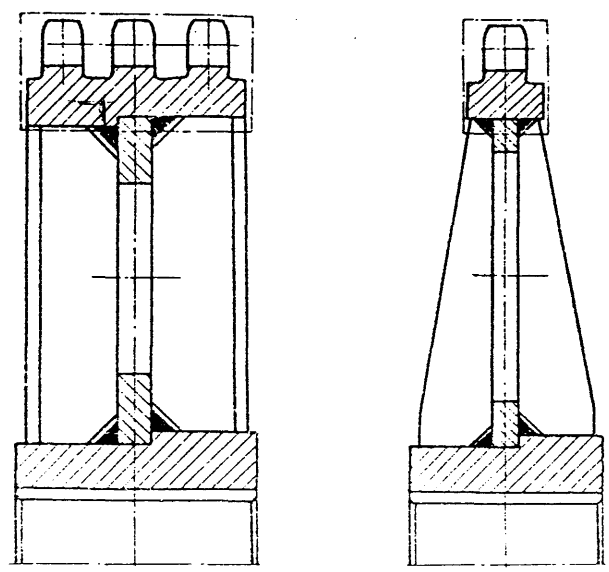

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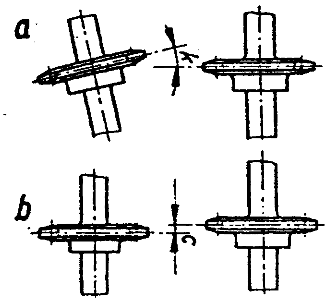

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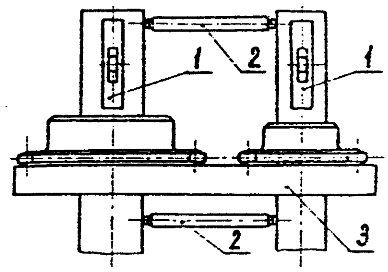

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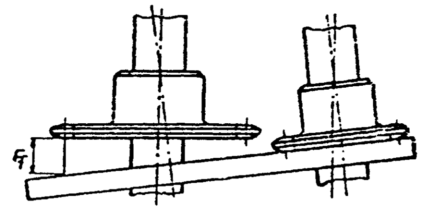
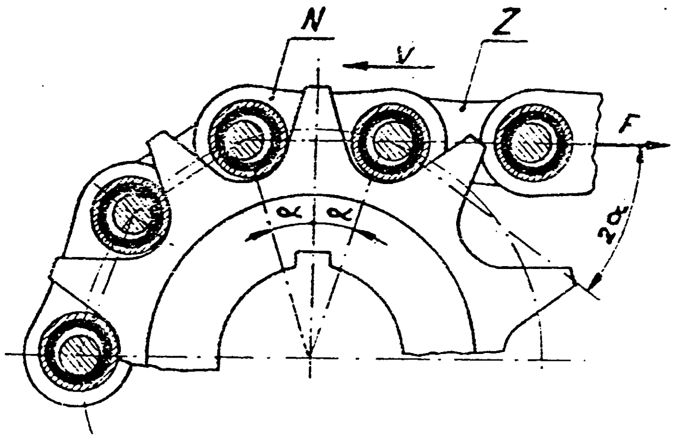
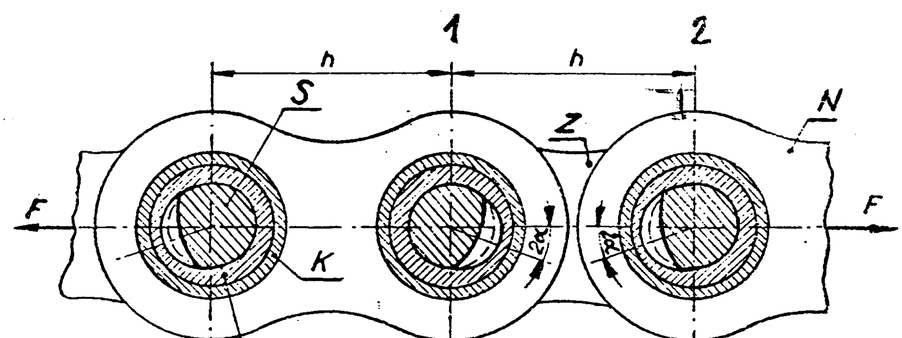


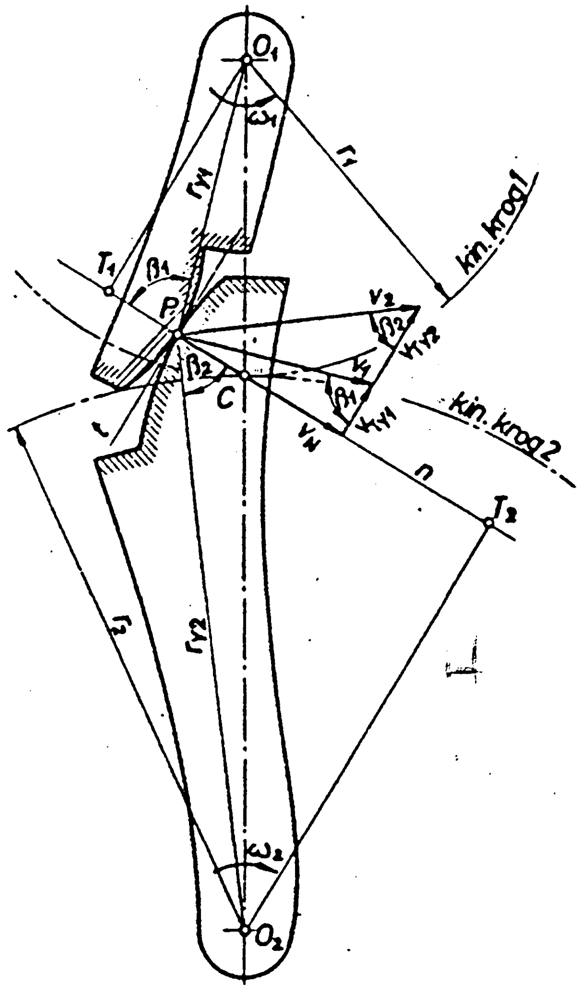
Sl.45.3



Sl. 1o4.1



Sl. 1o5.1



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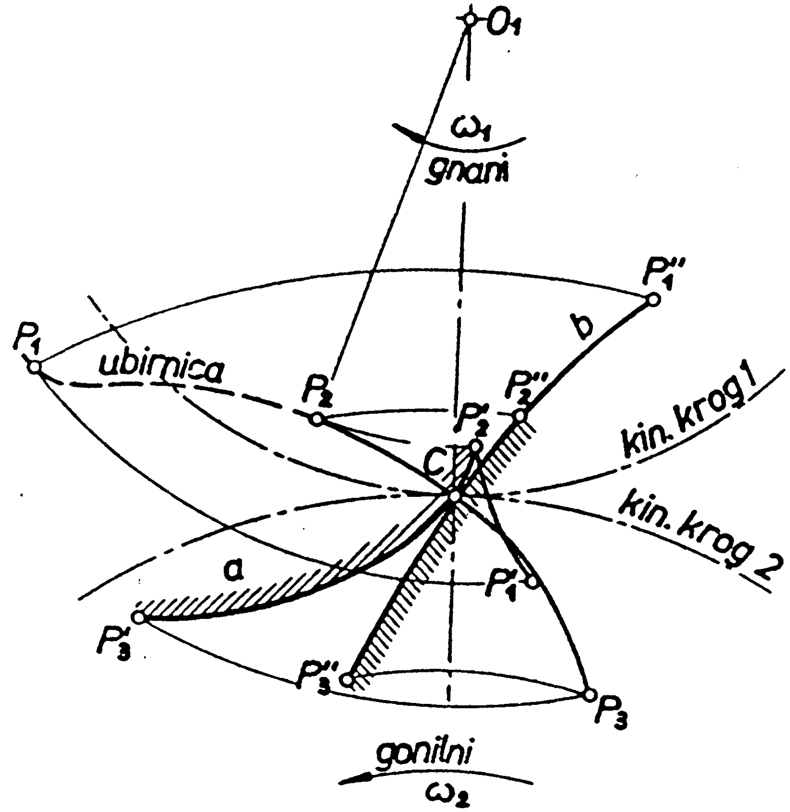

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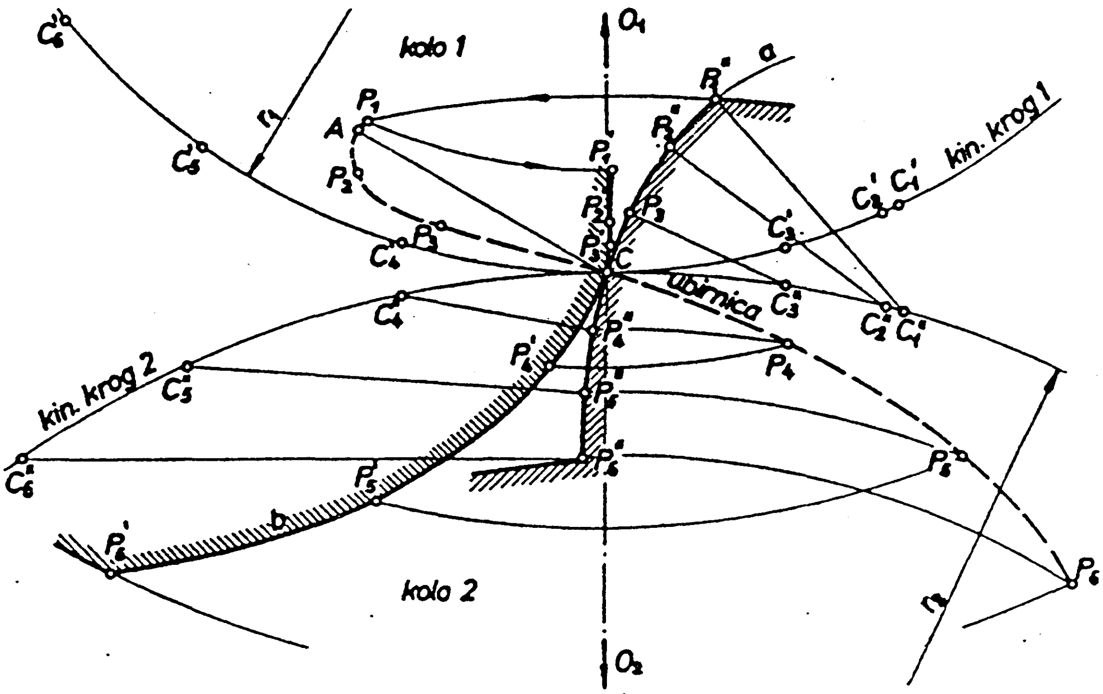

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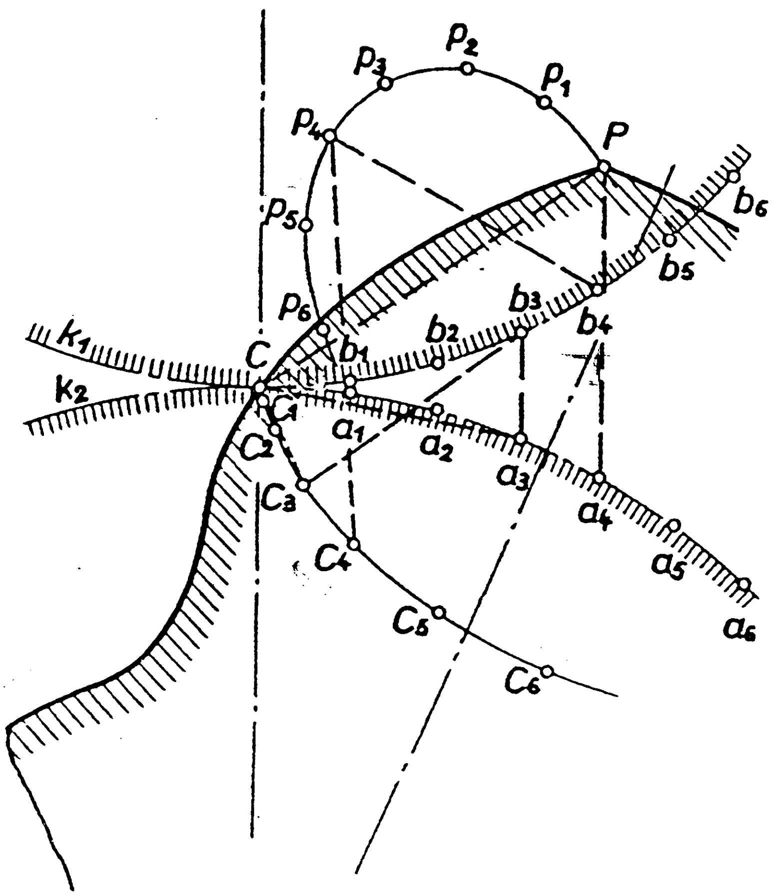

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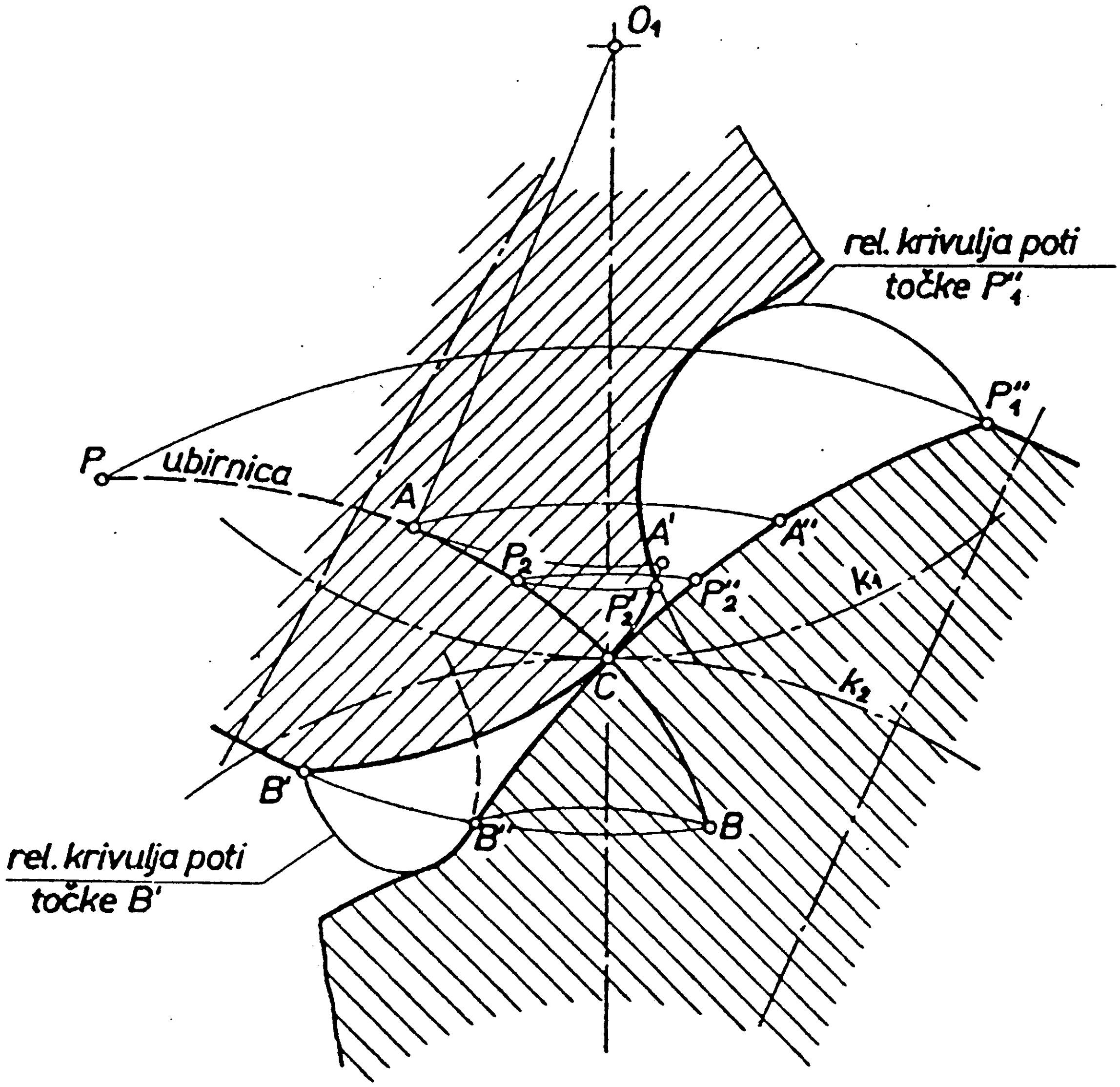

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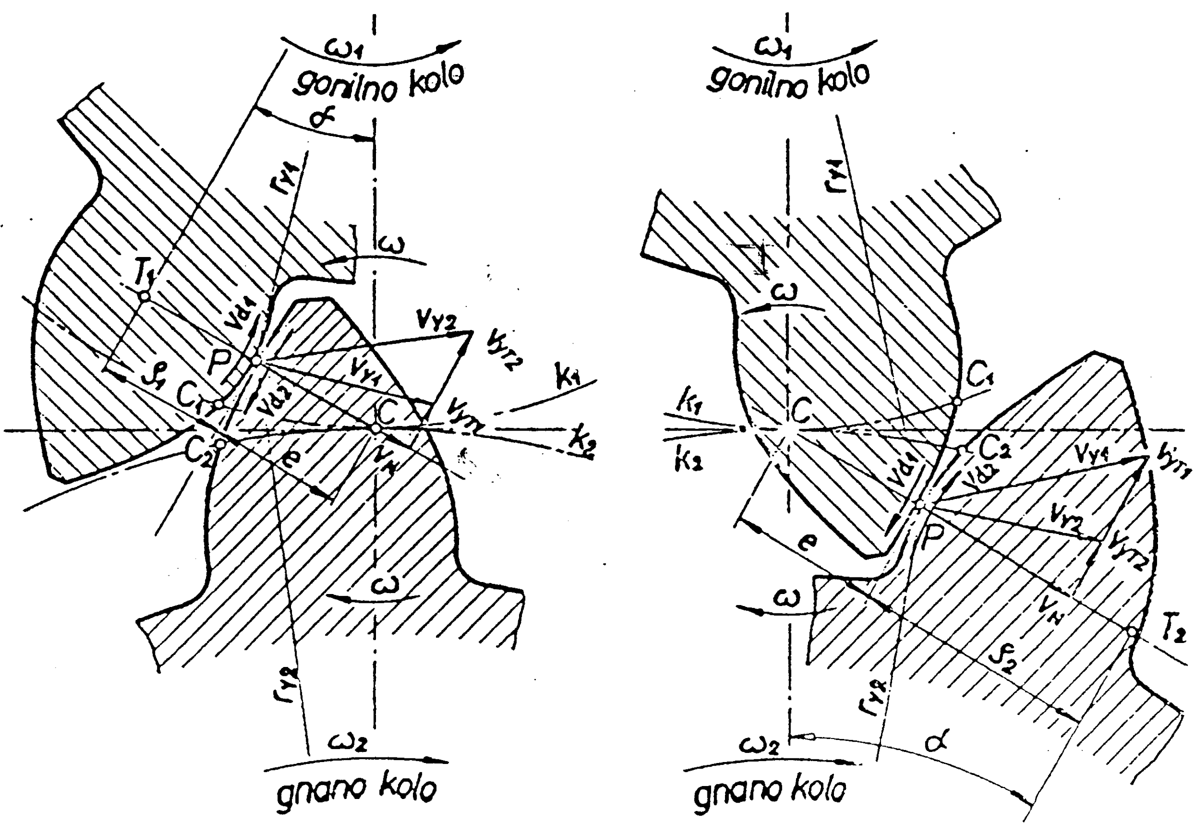

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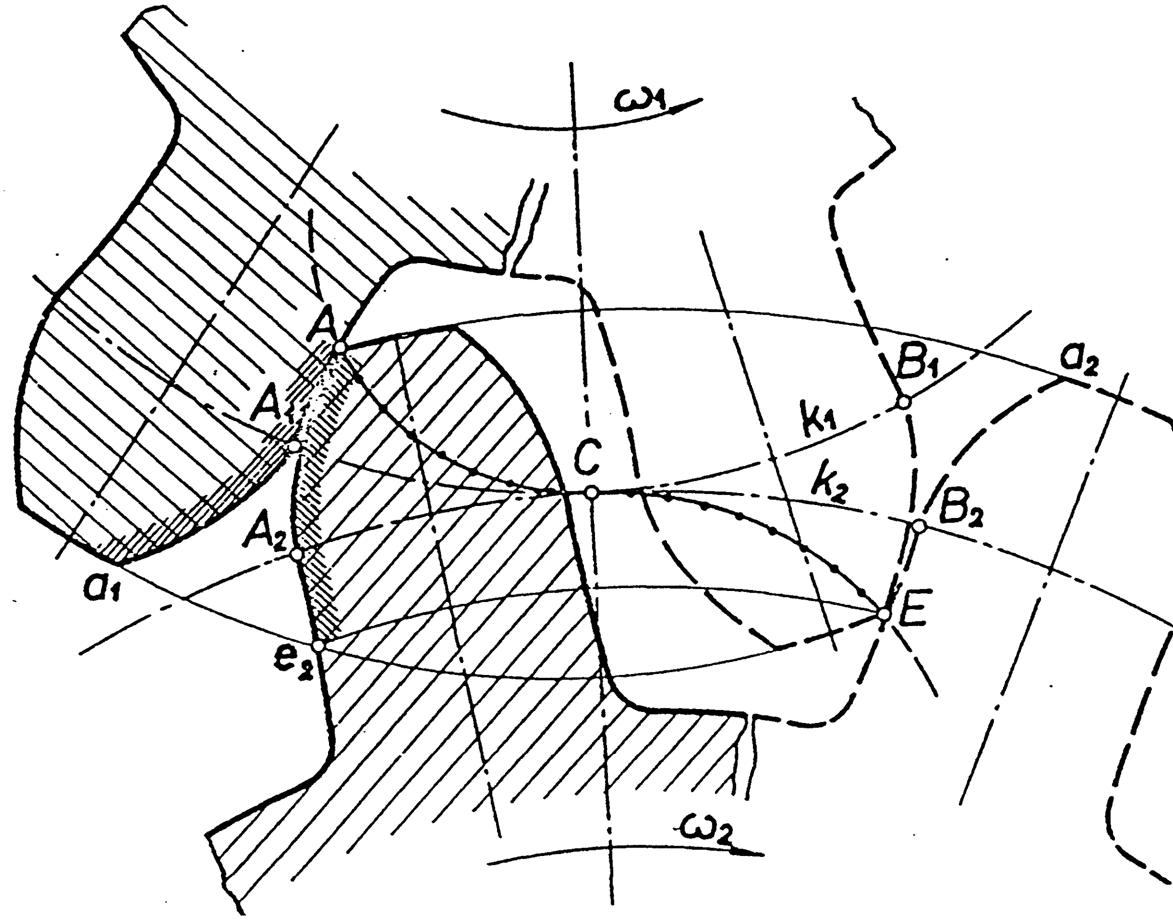

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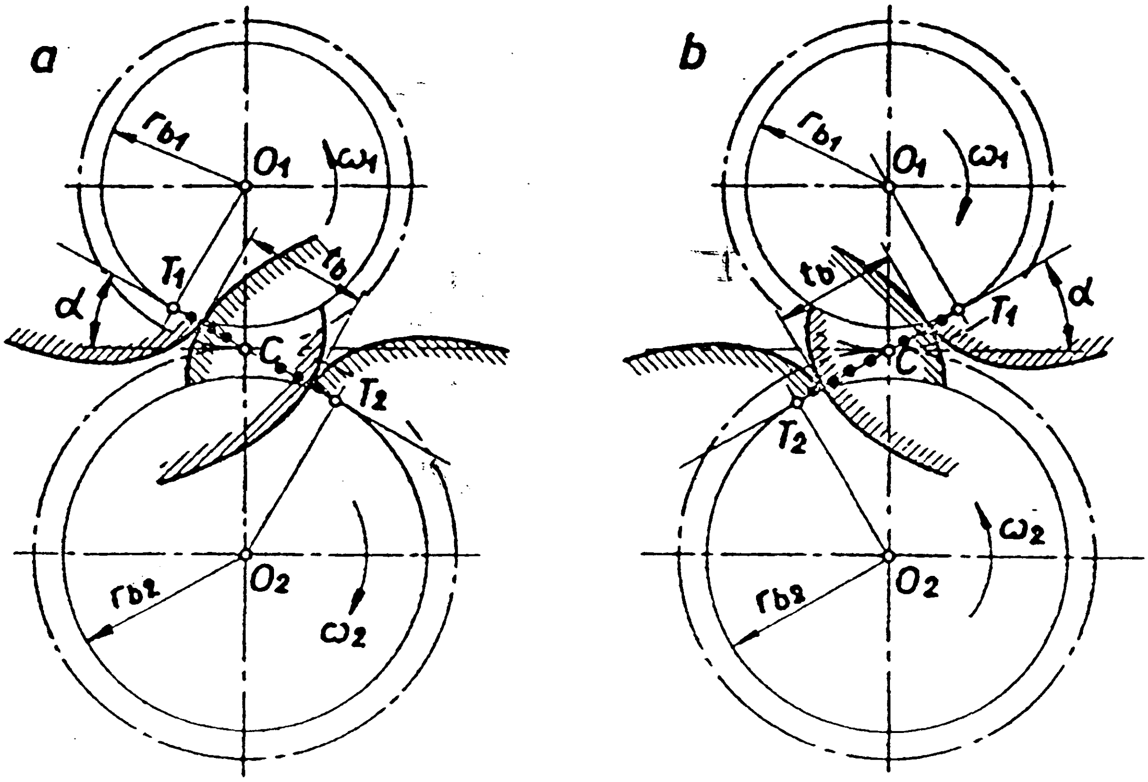
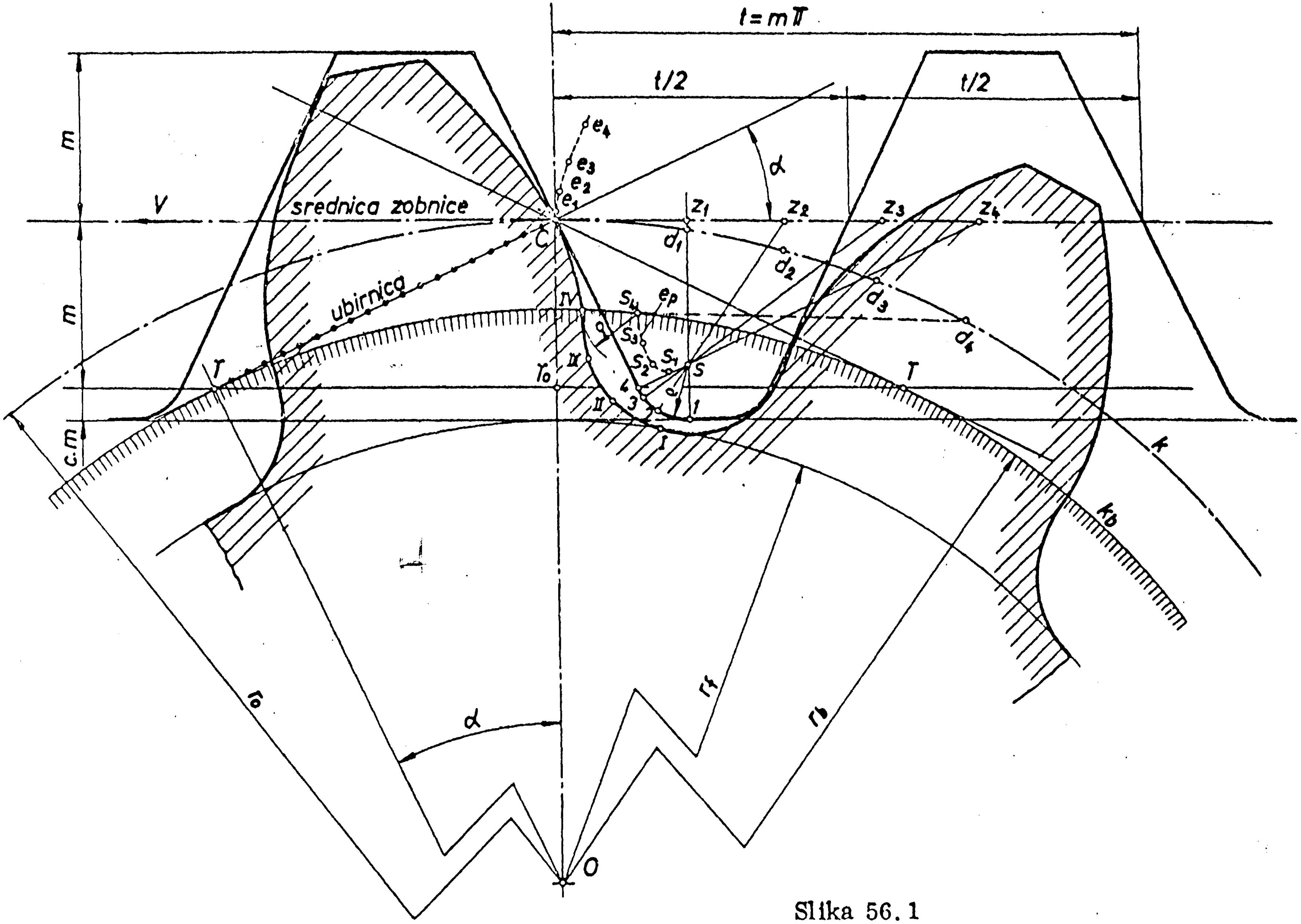
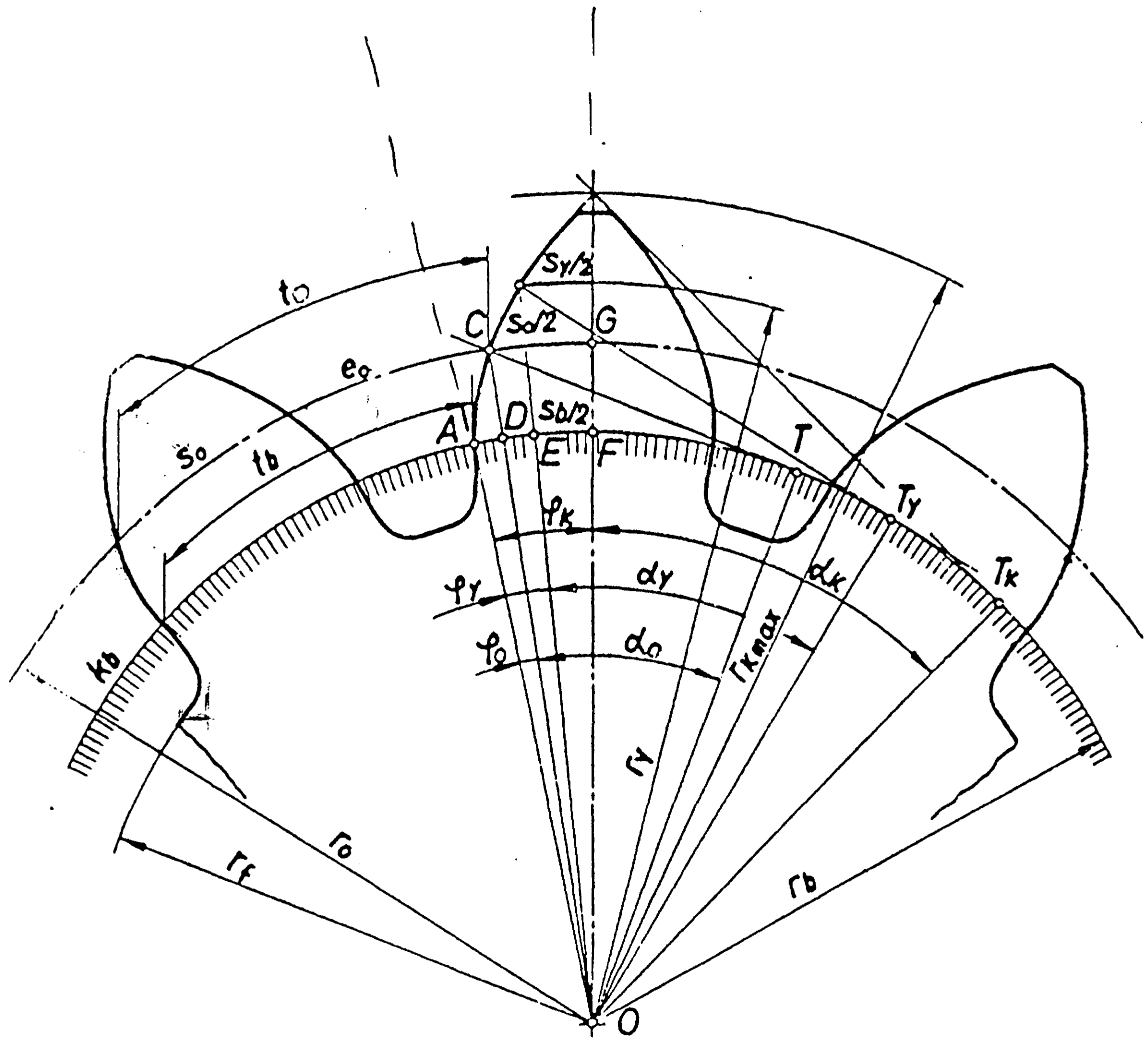


Slika 51.1

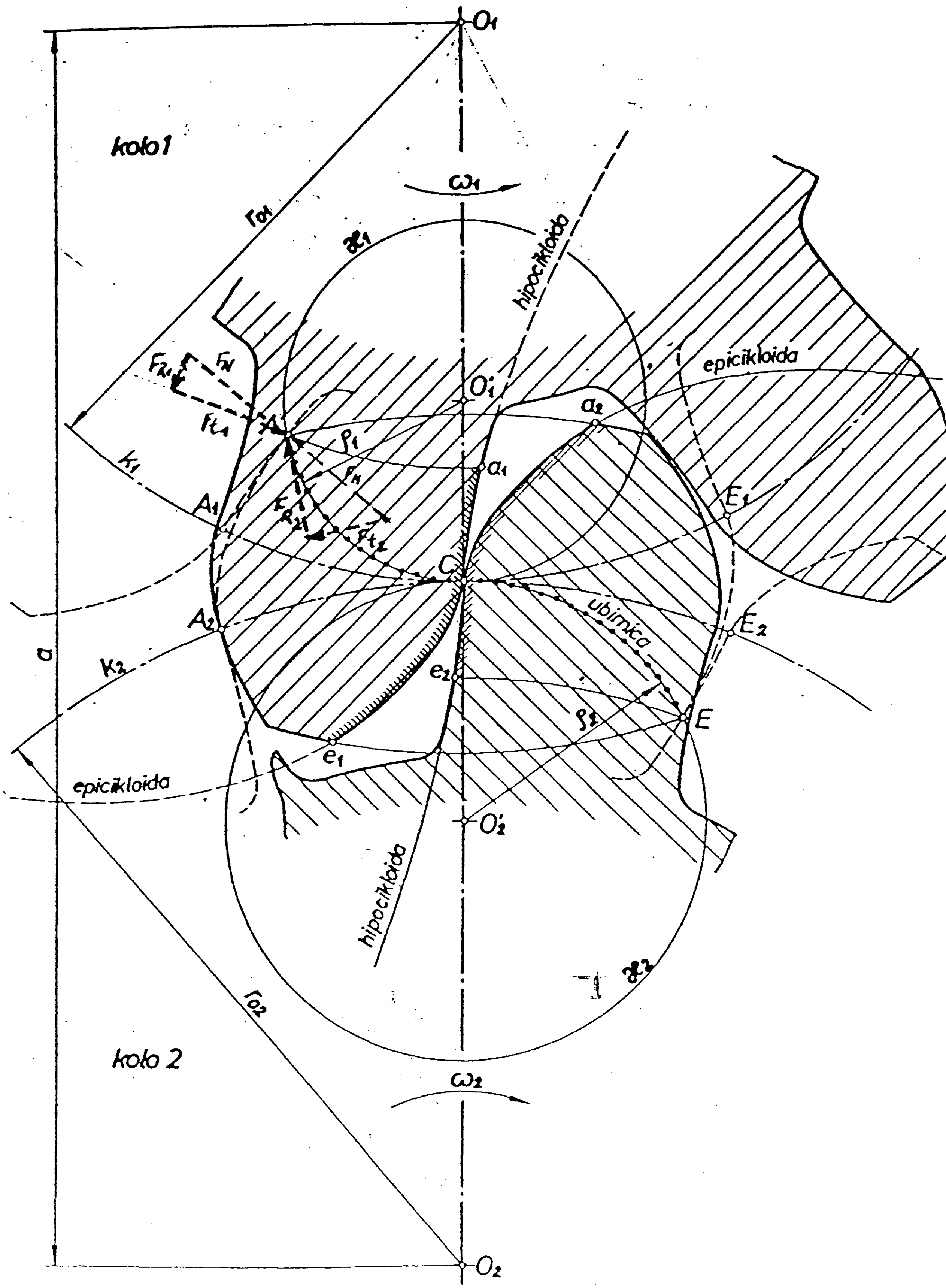

t=mπ
t/2
t/2
m
m
c.m
V
srednica zobnice
ubirnica
α
α
C
O
T
T
k
k_b
r_o
r_f
r_b
e_1
e_2
e_3
e_4
e_p
z_1
z_2
z_3
z_4
d_1
d_2
d_3
d_4
S
S_1
S_2
S_3
S_4
I
II
III
IV
1
3
4
γ_o

Slika 56.1

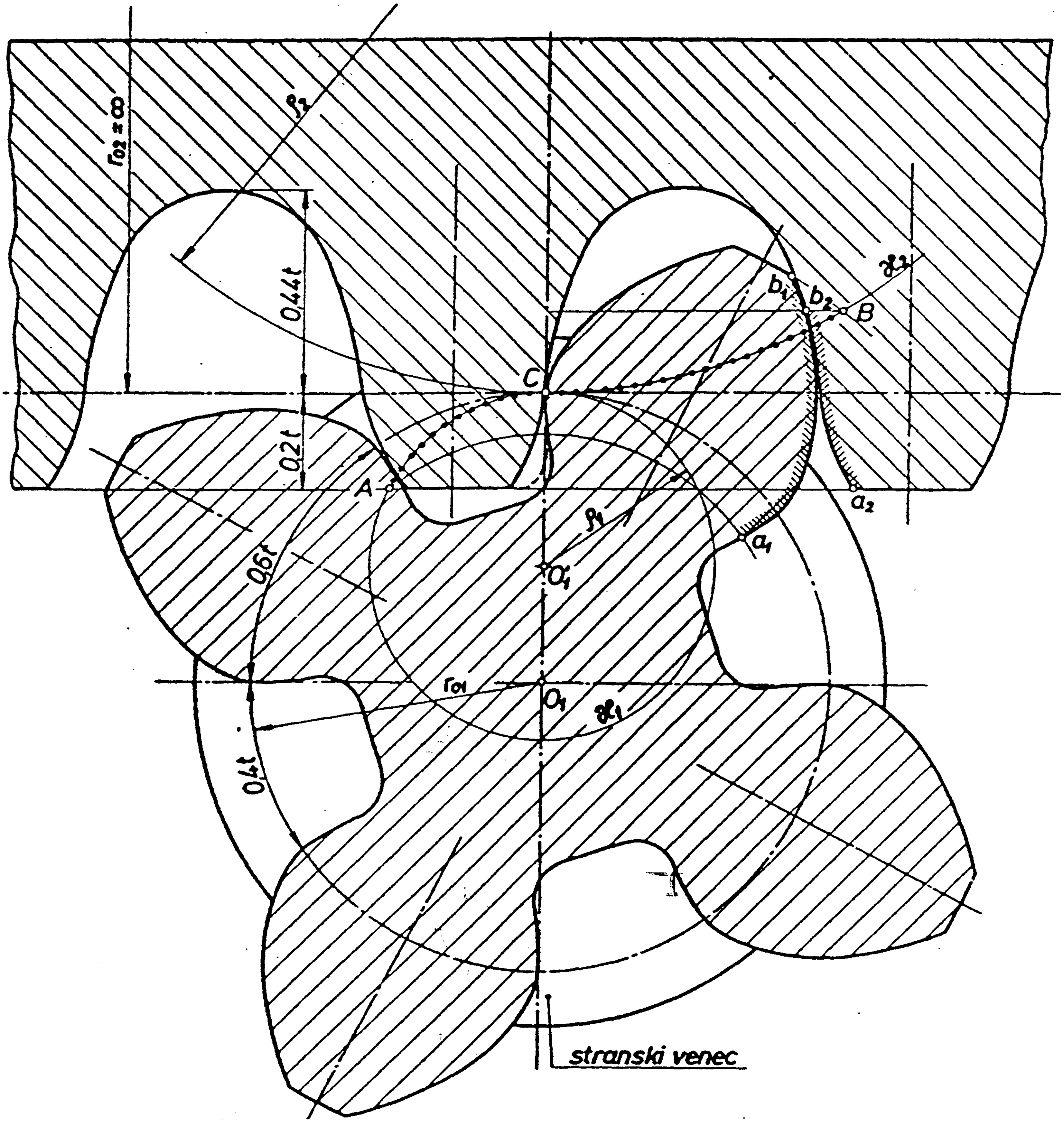


to
C
G
Sy/2
So/2
eo
So
tb
A
D
E
F
Sb/2
T
Ty
Tk
kb
φk
φy
φo
αy
αk
αo
rkmax
ry
ro
rf
rb
O

Slika 53.1

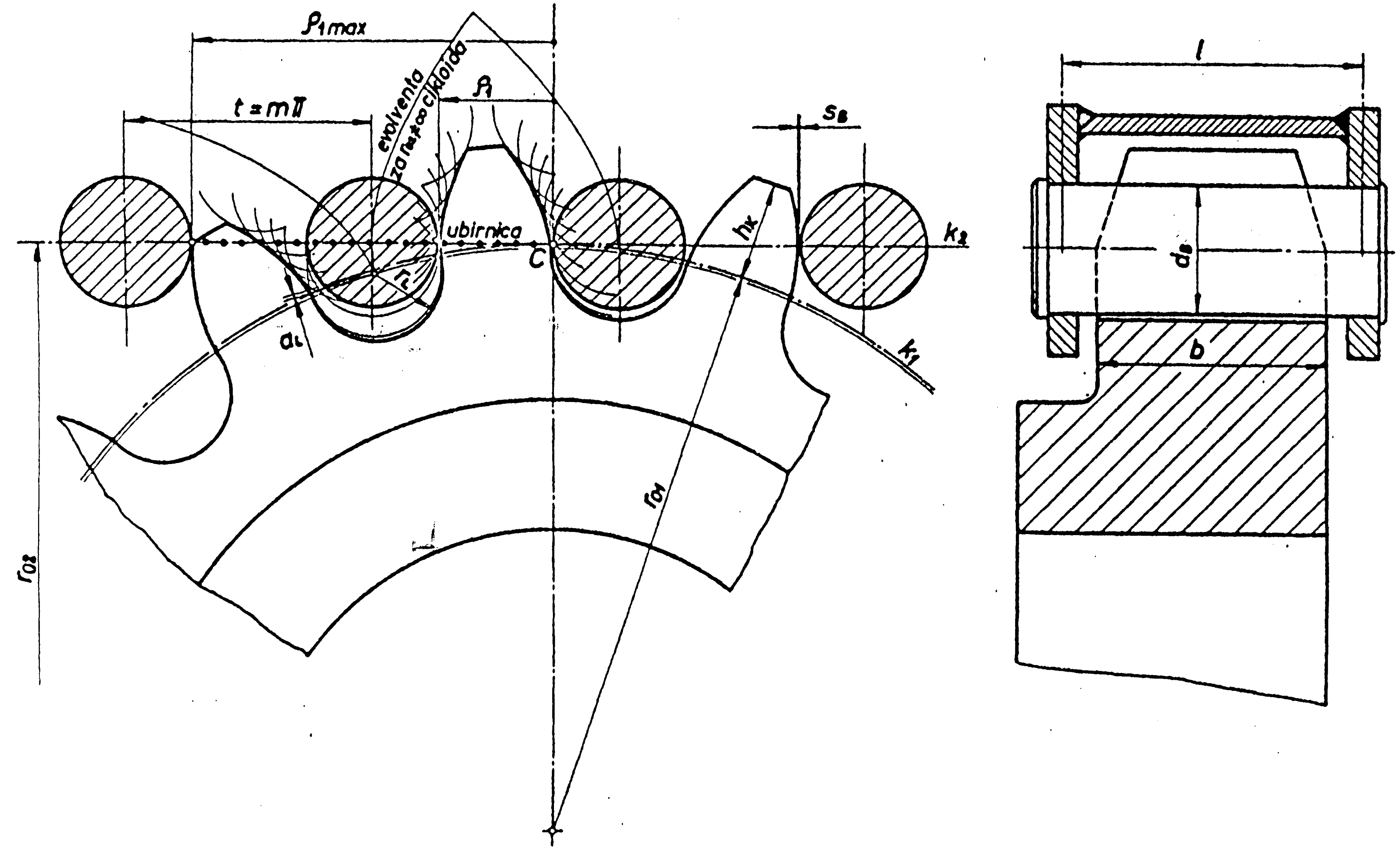


Slika 36.1

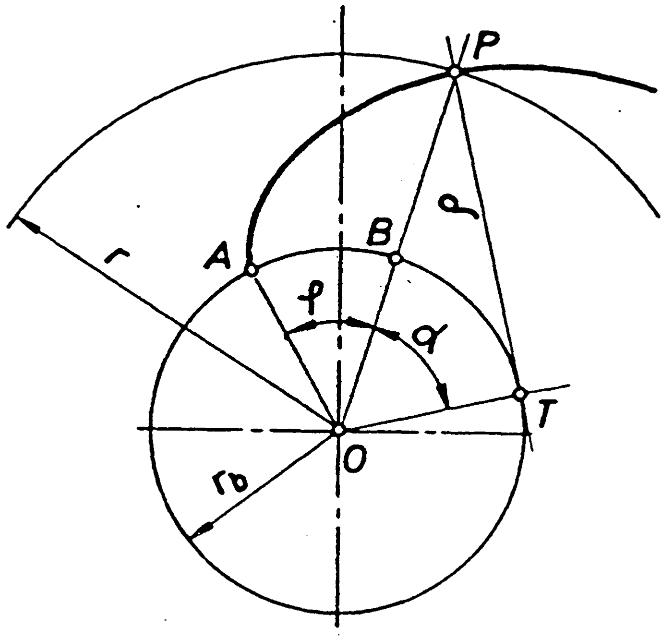


$r_{02}=\infty$
ρ_2
0,44t
0,2t
C
A
B
b_1
b_2
a_2
a_1
ρ_1
O_1
r_{01}
0,6t
0,4t
stranski venec

Slika 42.1


ρ1max
t = mπ
evolventa
za r≠∞ cikloida
ρ1
ubirnica
C
sB
hK
k2
k1
a
r
r01
r02
l
dB
b

Slika 43.1



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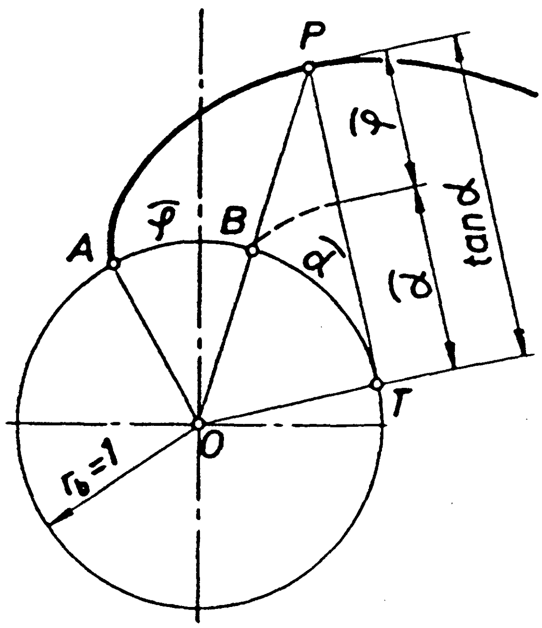
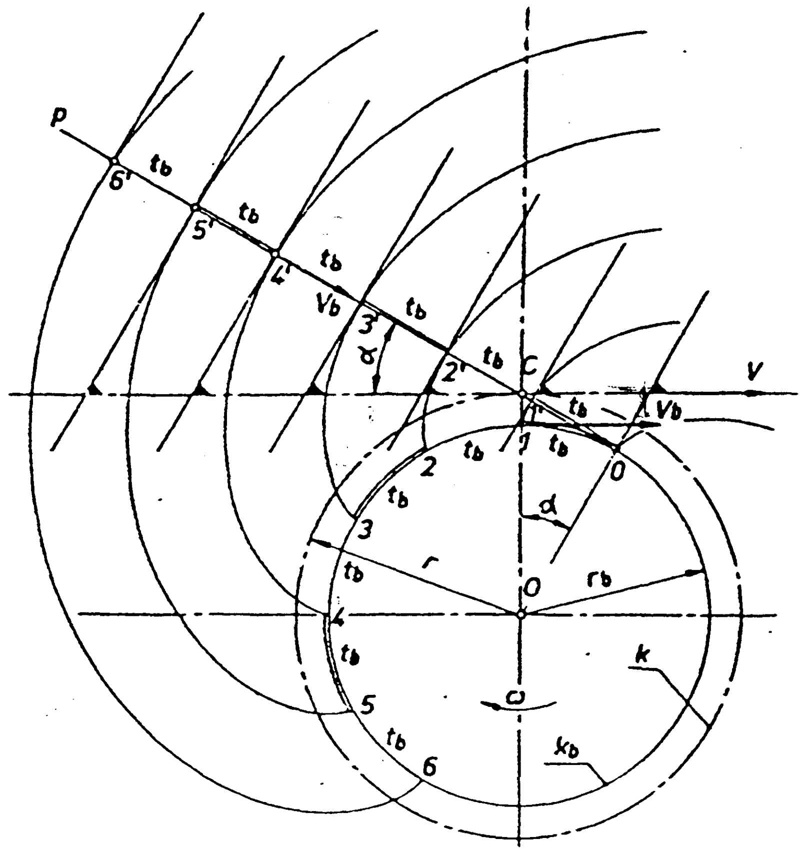


Slika 52.2



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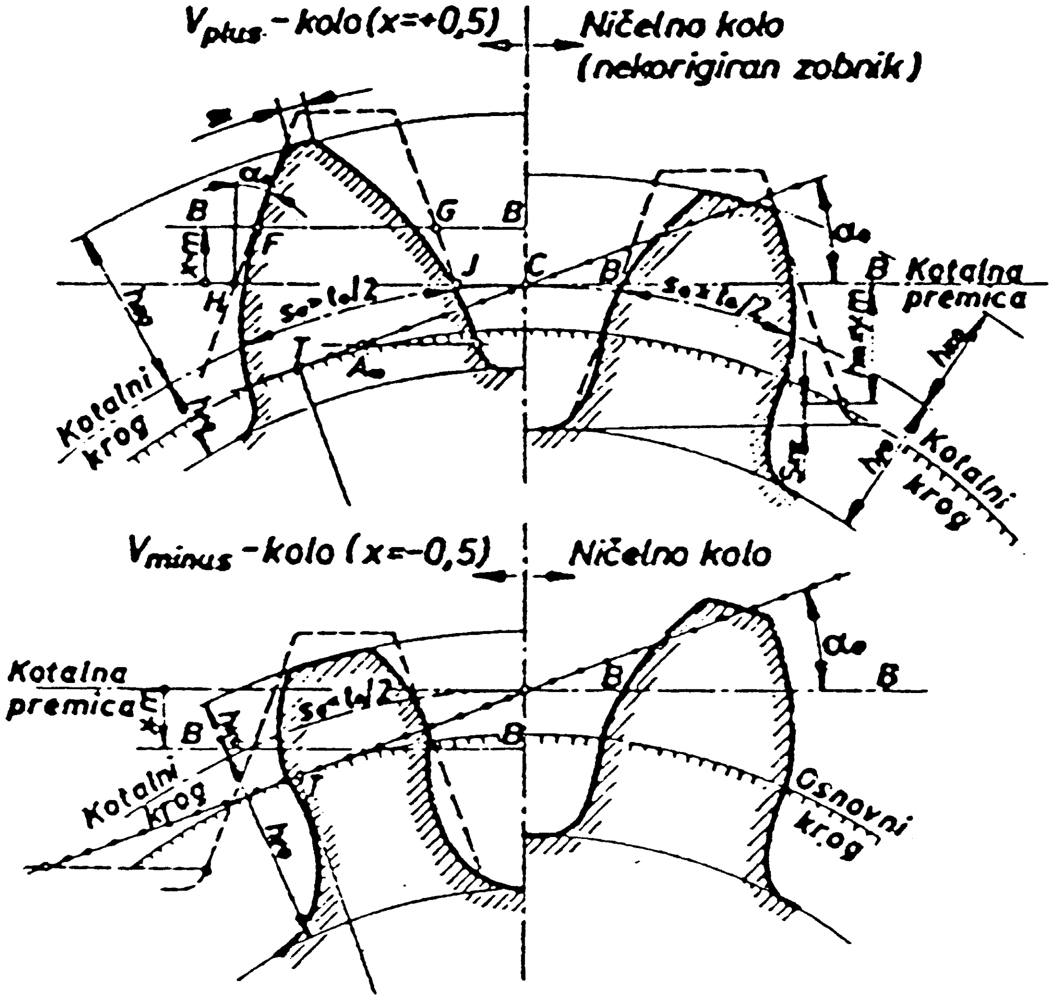
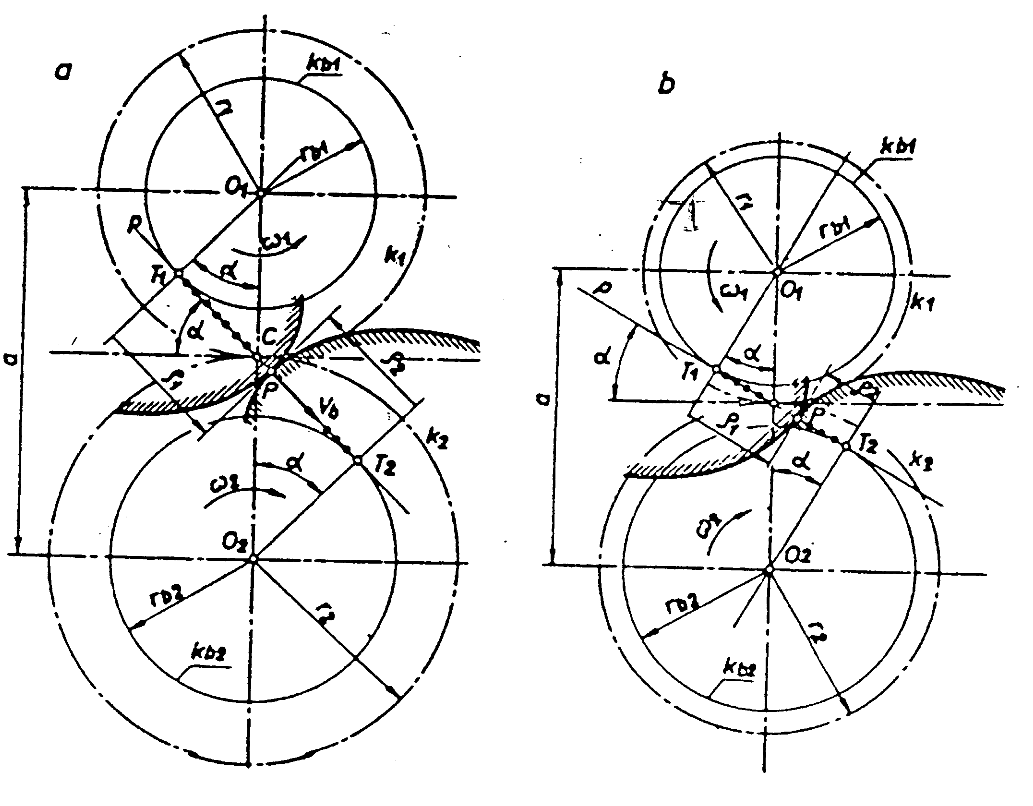
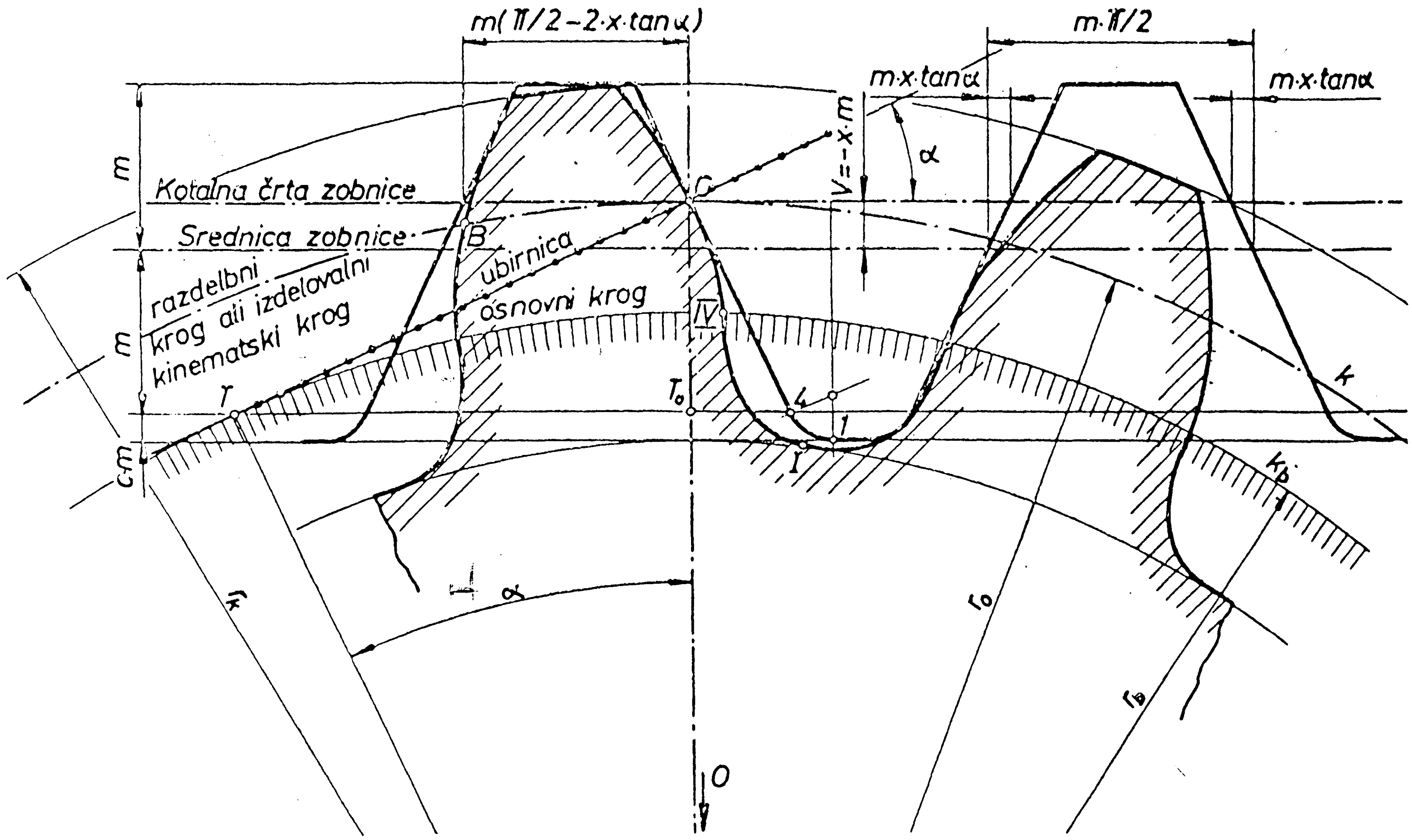


Slika 63.1

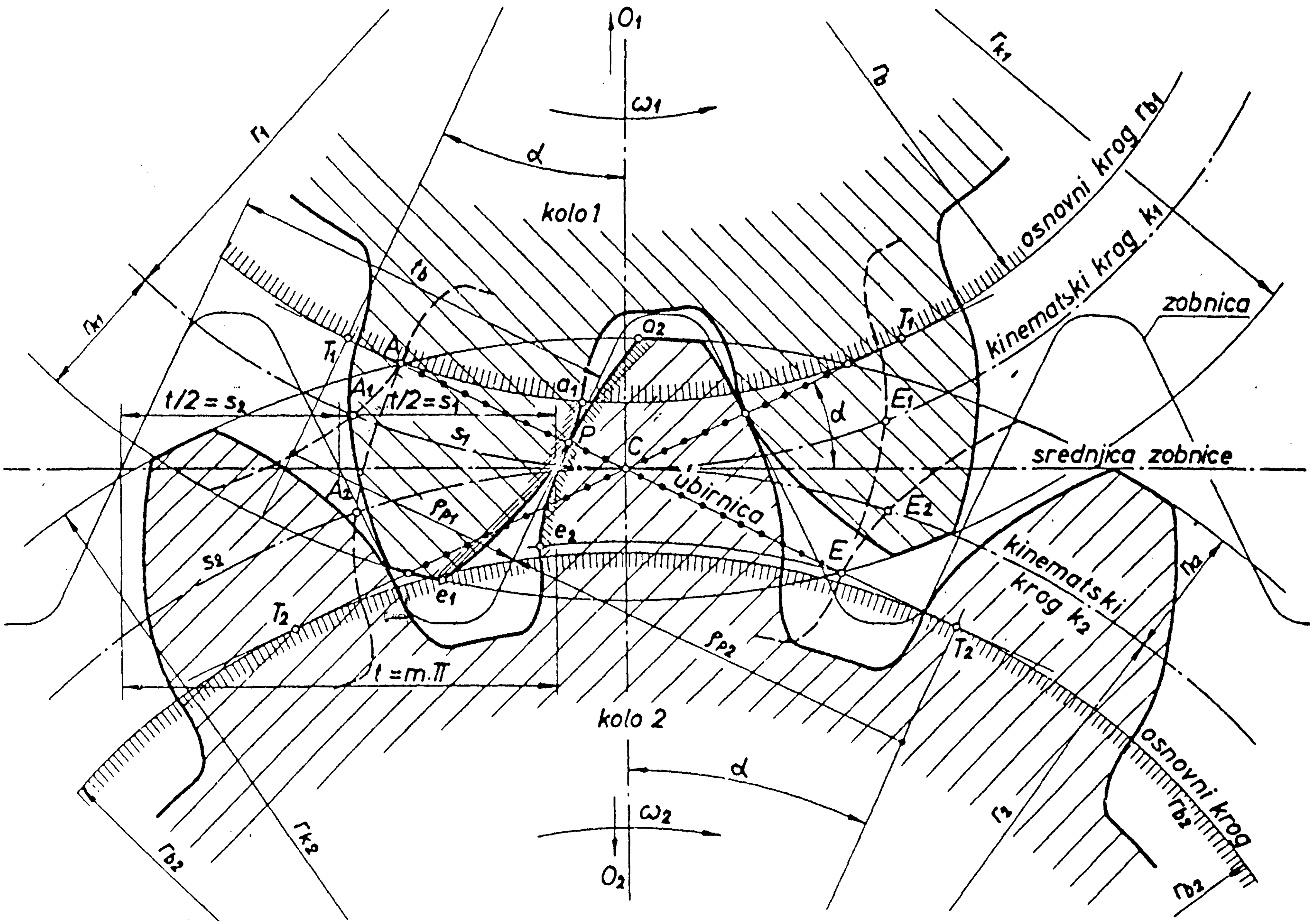


Slika 49.1



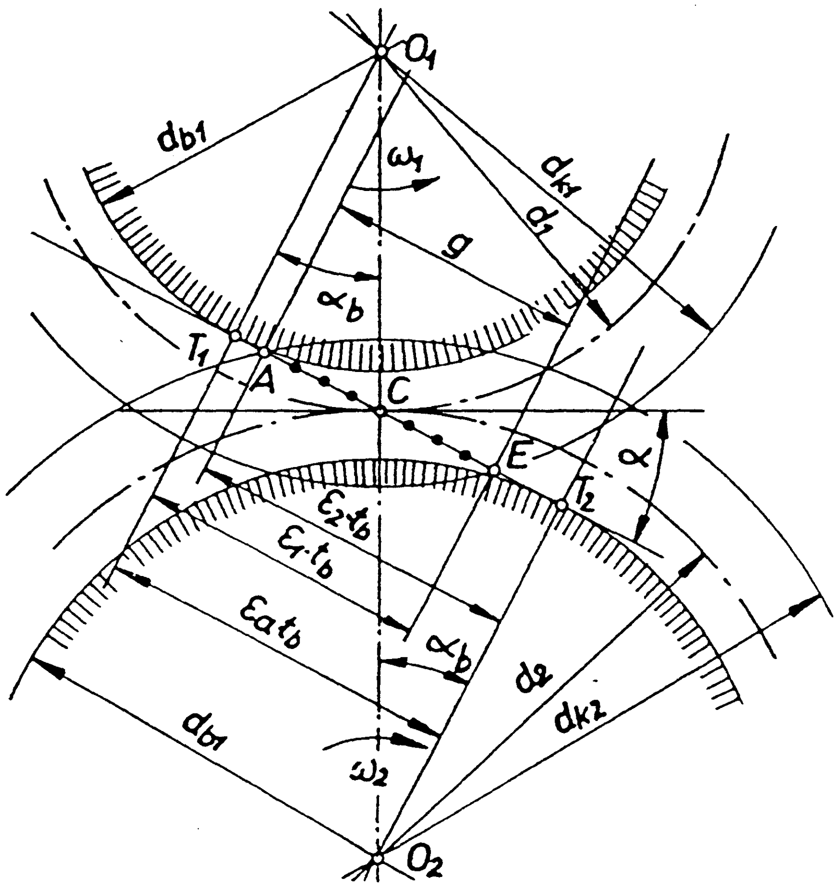
m(π/2−2·x·tanα)
m·π/2
m·x·tanα
m·x·tanα
m
Kotalna črta zobnice
Srednica zobnice
B
C
V=−x·m
α
ubirnica
razdelbni
krog ali izdelovalni
kinematski krog
osnovni krog
IV
m
T
T₀
4
1
I
k
c·m
kb
α
O

Slika 64.1

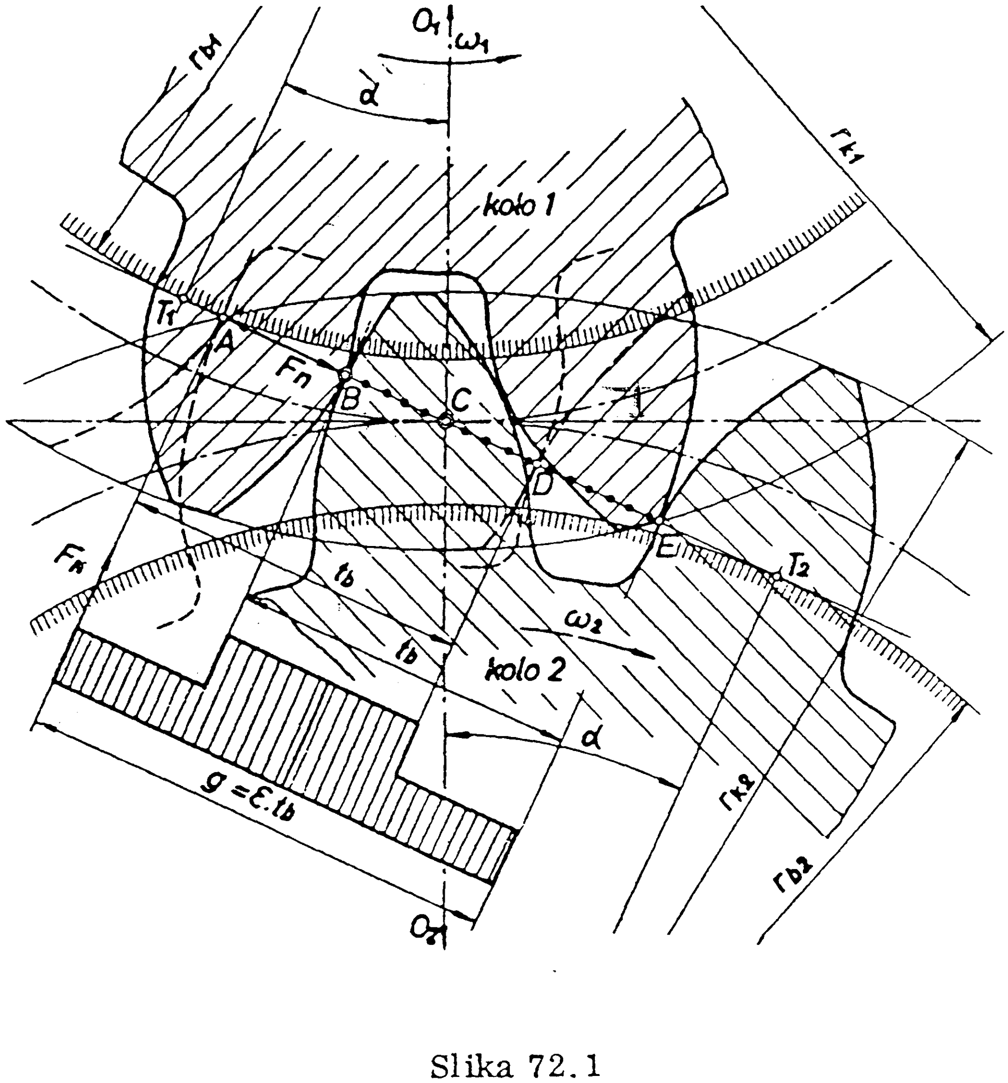


O1
ω1
α
kolo 1
osnovni krog rb1
kinematski krog k1
zobnica
srednica zobnice
ubirnica
kinematski krog k2
kolo 2
osnovni krog
ω2
O2
t/2 = s2
t/2 = s1
t = m.π

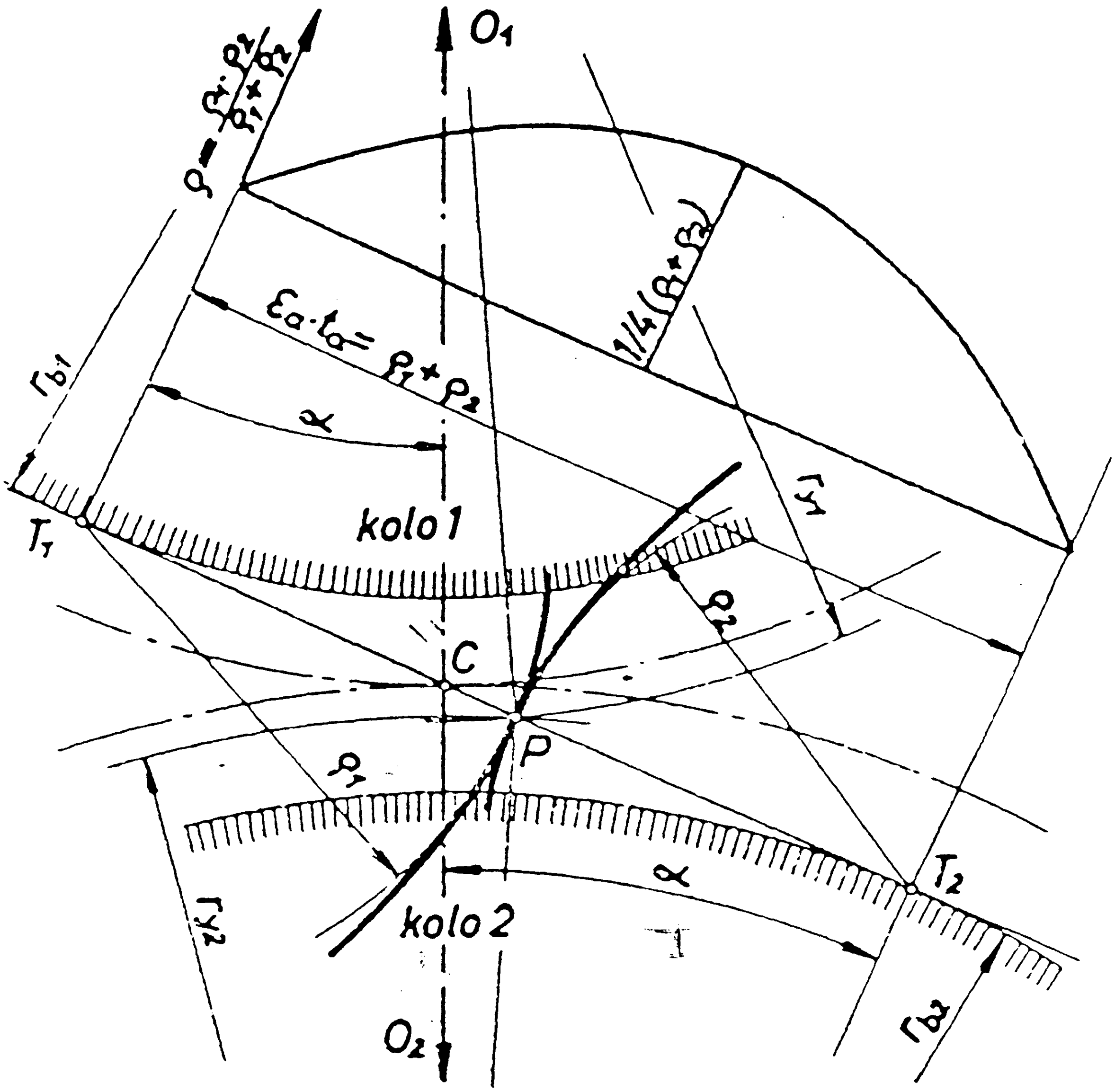
Slika 66.1



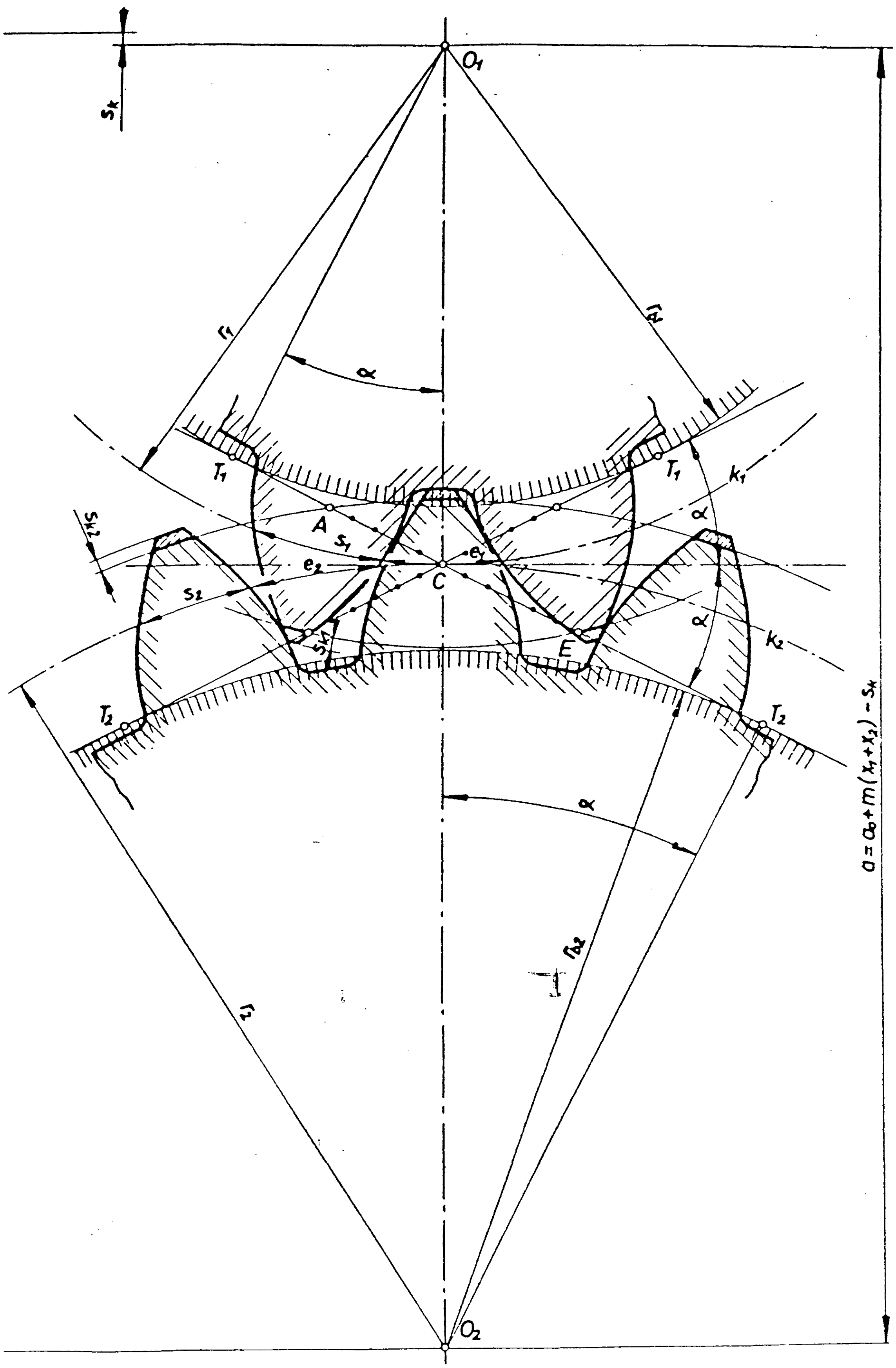
Slika 69.1



Slika 72.1

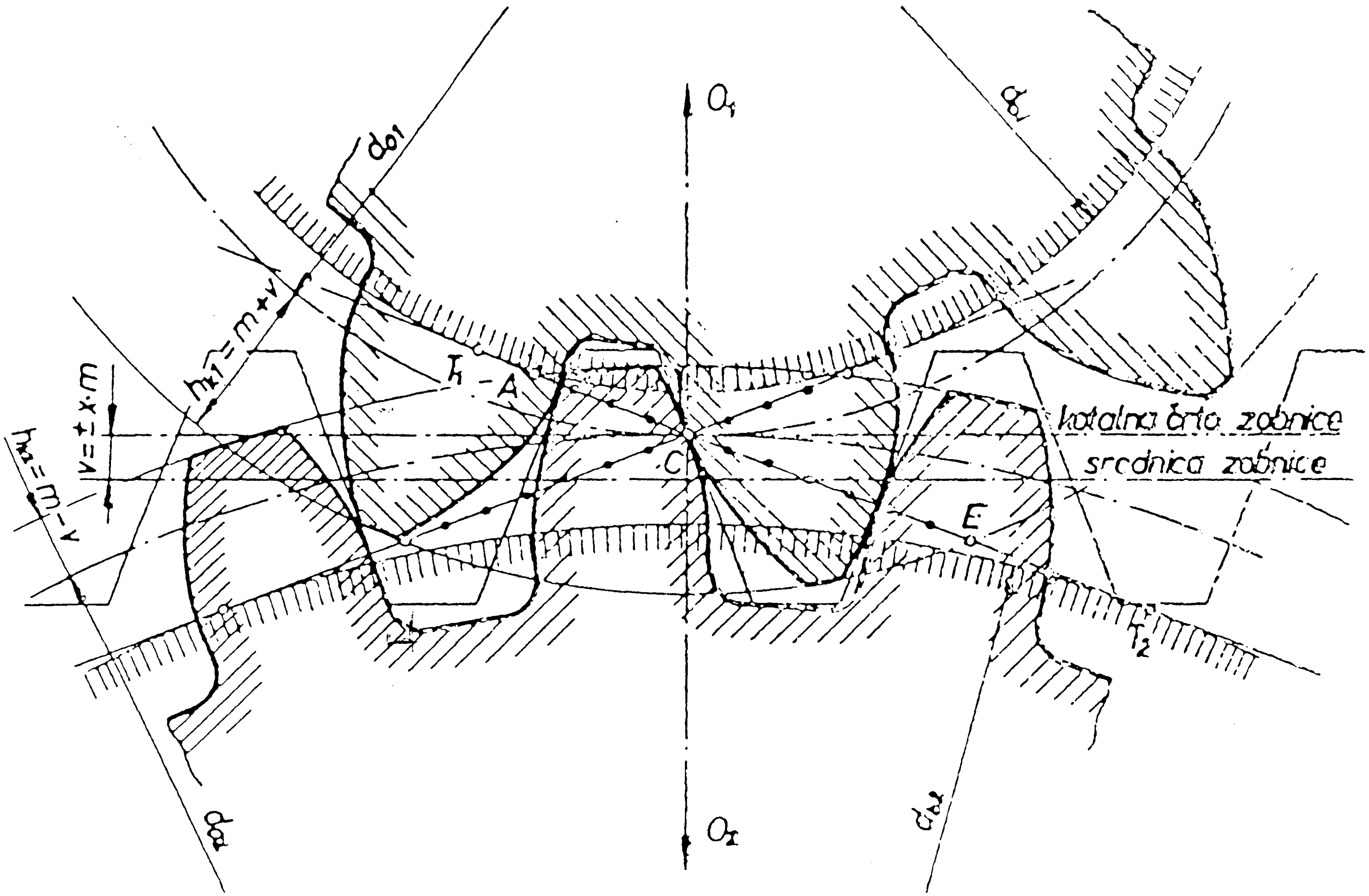

O1
O2
kolo 1
kolo 2
C
P
T1
T2
rb1
rb2
ry1
ry2
α
α
ρ1
ρ2
1/4(ρ1+ρ2)
εa·ta= ρ1+ρ2
ρ = ρ1·ρ2 / ρ1+ρ2

Slika 73.1



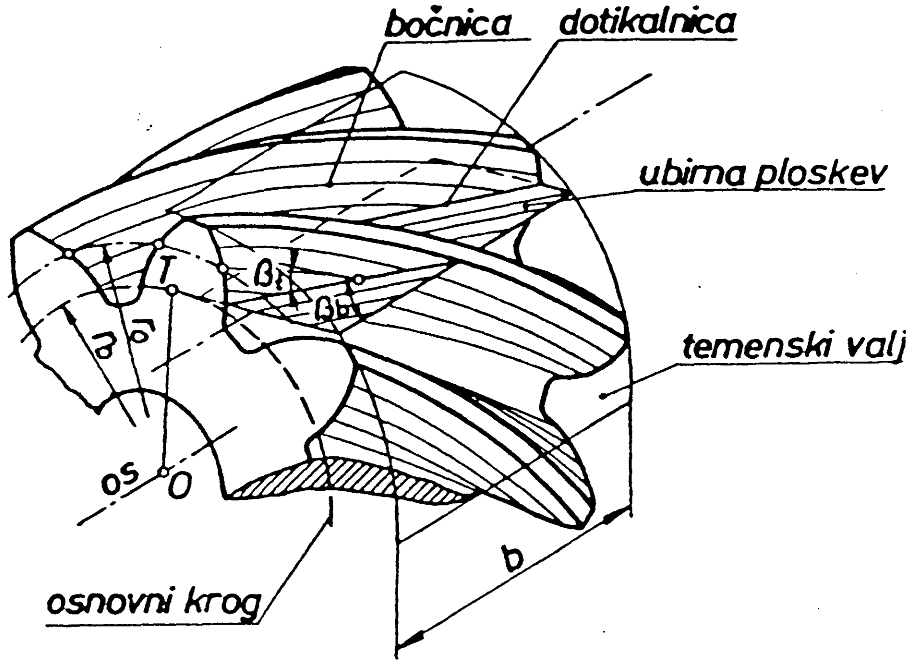
O_1
O_2
s_k
r_1
r_{b1}
r_2
r_{b2}
α
T_1
T_2
k_1
k_2
A
C
E
s_1
s_2
e_1
e_2
s_{k1}
s_{k2}
$a = a_0 + m(x_1 + x_2) - s_k$

Slika 81.1

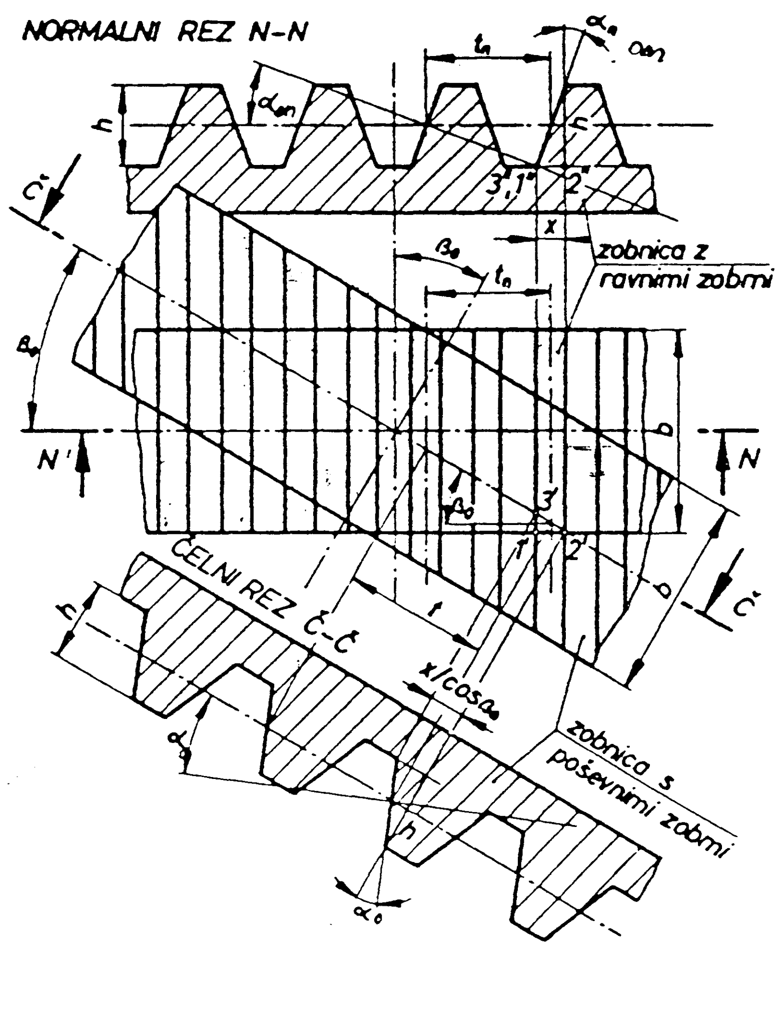


O_1
O_2
d_{01}
d_{02}
d_{a1}
d_{a2}
$h_{f1} = m+v$
$h_{f2} = m-v$
$v = \pm x \cdot m$
T_1
A
C
E
T_2
kotalna črta zobnice
srednica zobnice

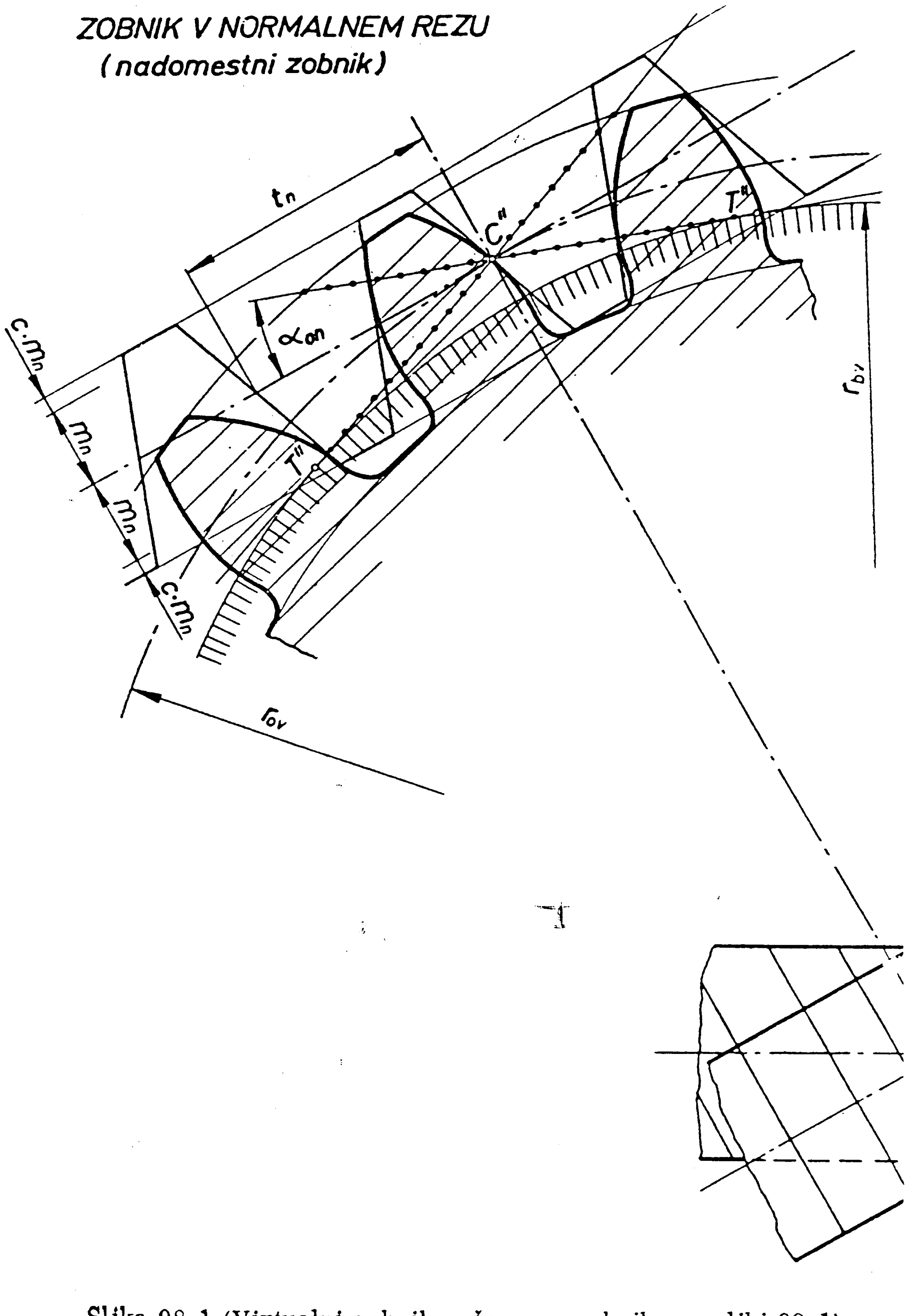
Slika 77.1



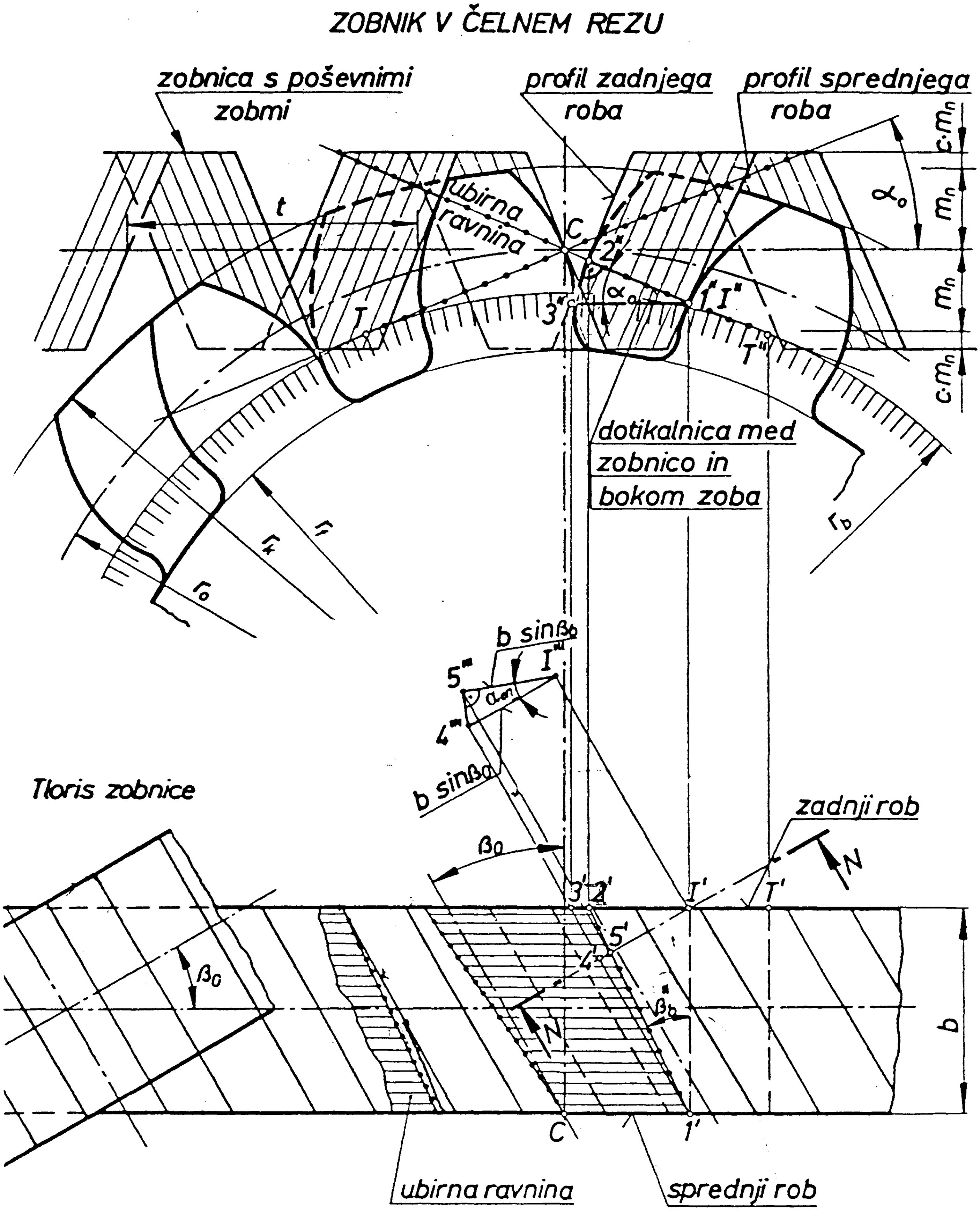
Slika 92.1



Slika 93.1

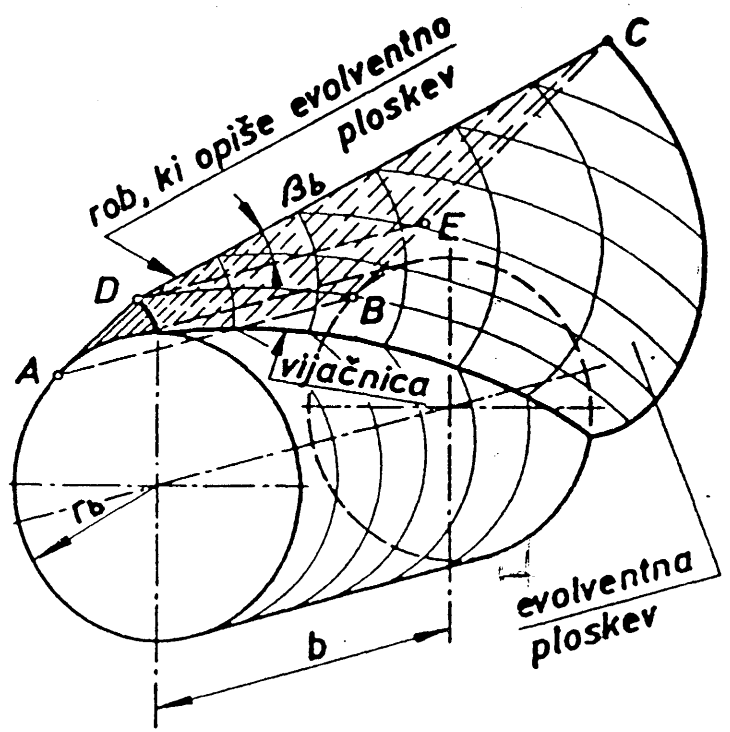


Slika 98.1 (Virtualni zobnik poševnega zobnika na sliki 99.1)

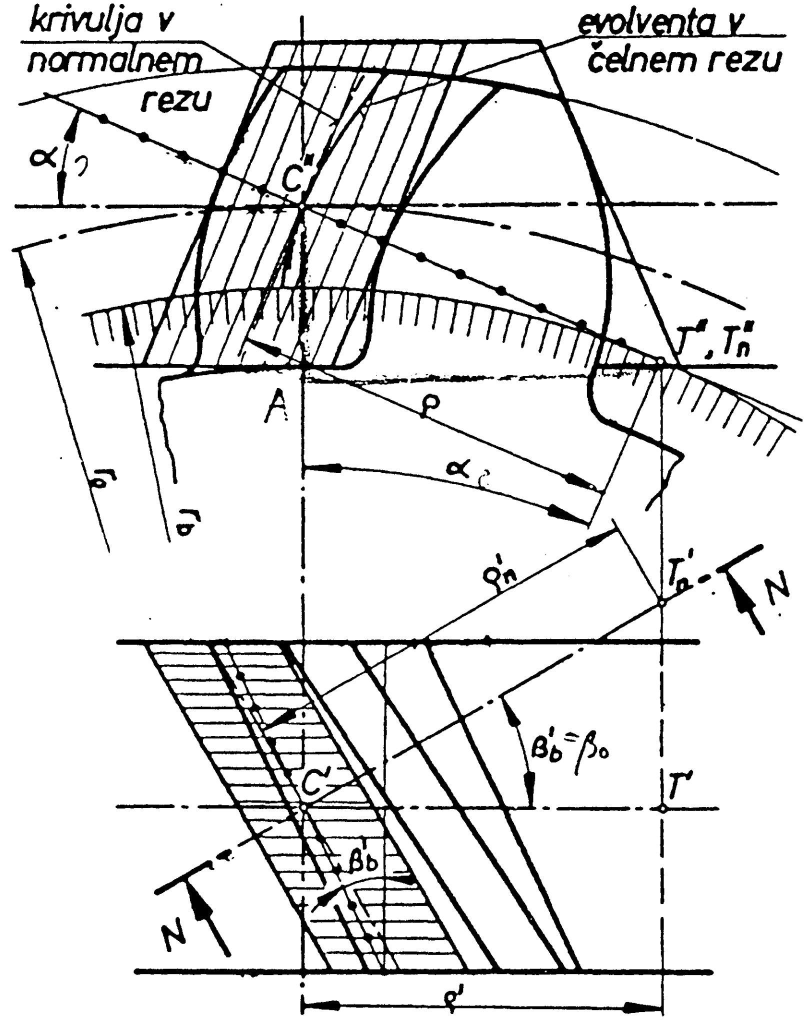


ZOBNIK V ČELNEM REZU
zobnica s poševnimi zobmi
profil zadnjega roba
profil sprednjega roba
ubirna ravnina
dotikalnica med zobnico in bokom zoba
b sinβb
b sinβ0
Tloris zobnice
zadnji rob
ubirna ravnina
sprednji rob

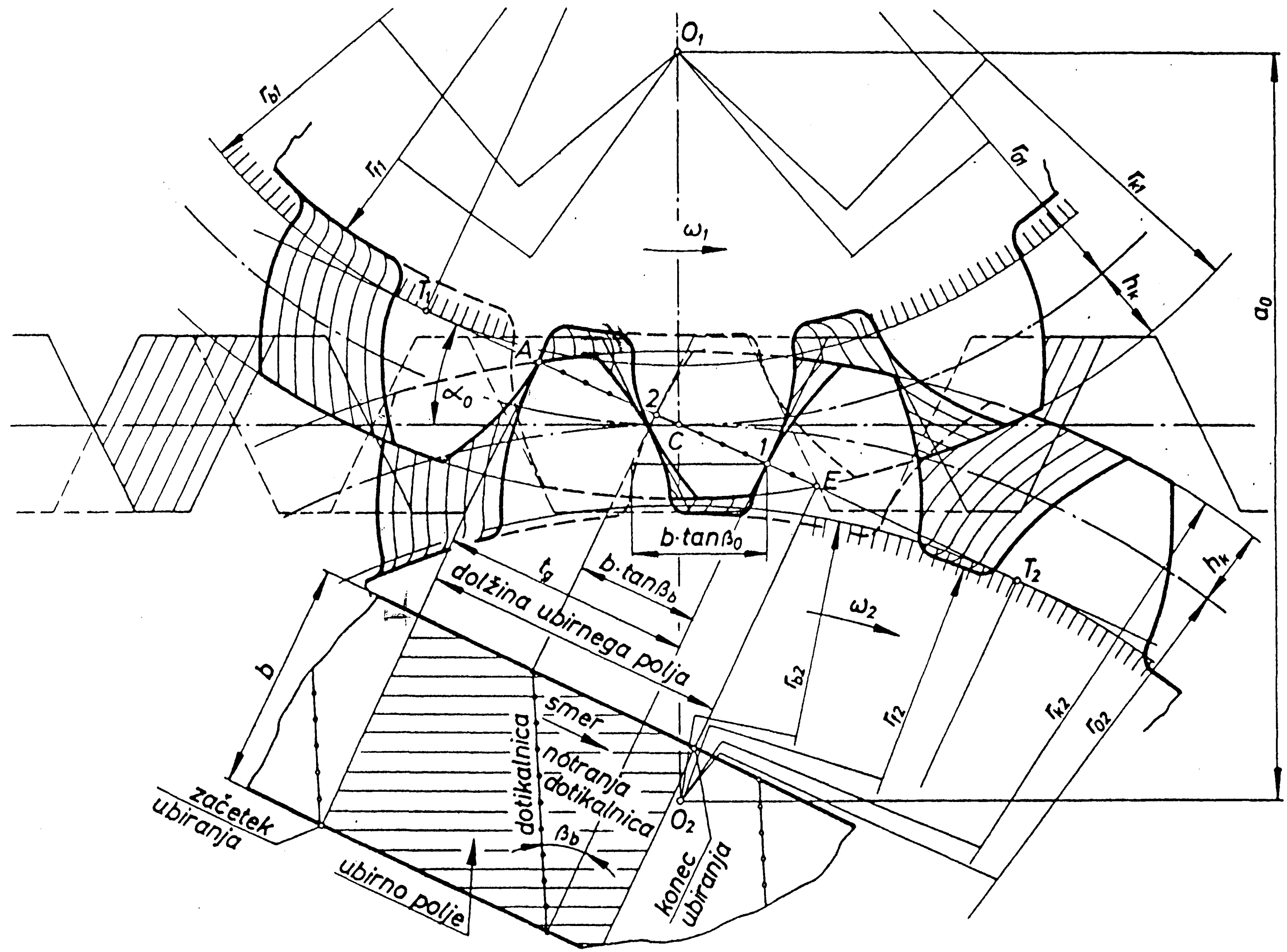
Slika 99.1



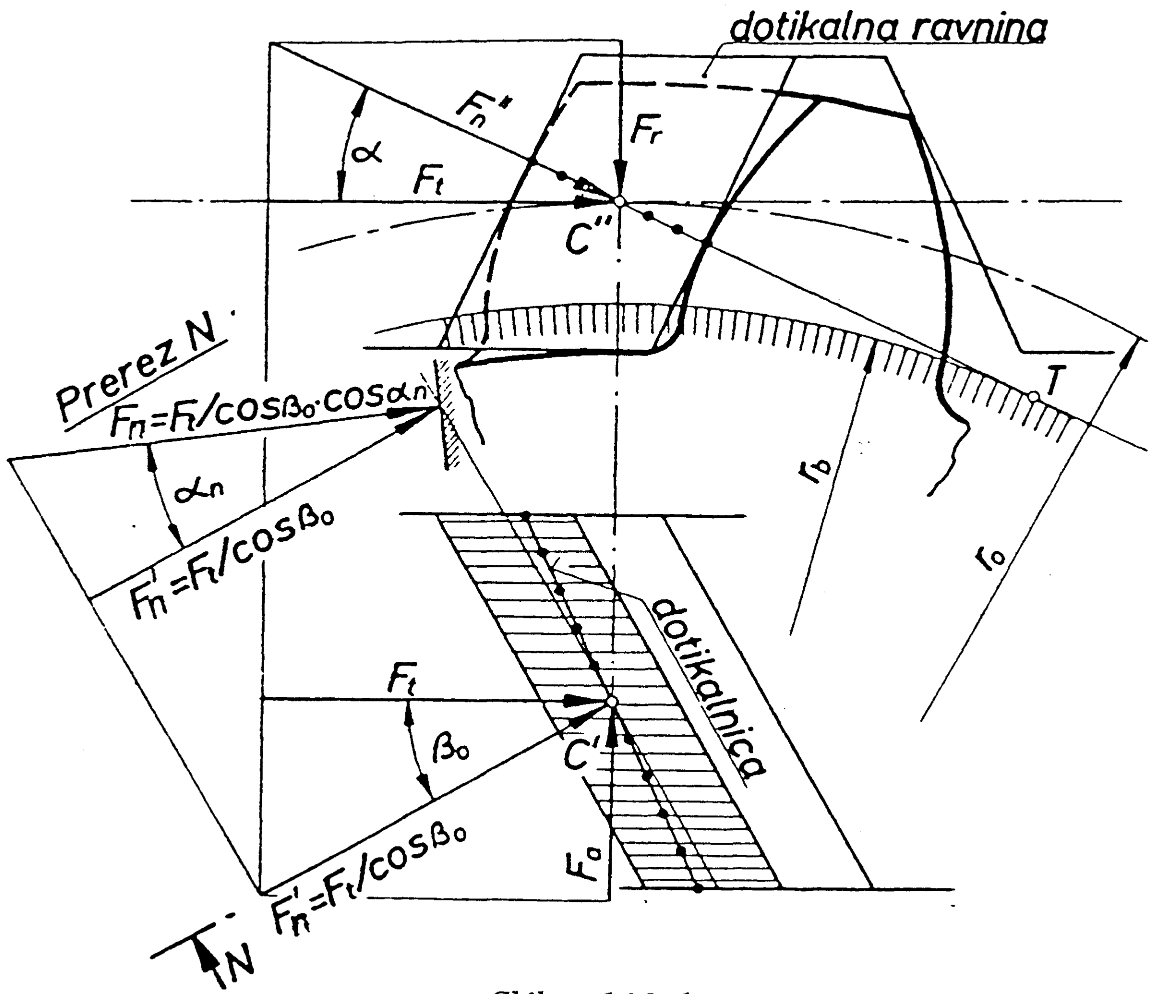
Slika 95.1



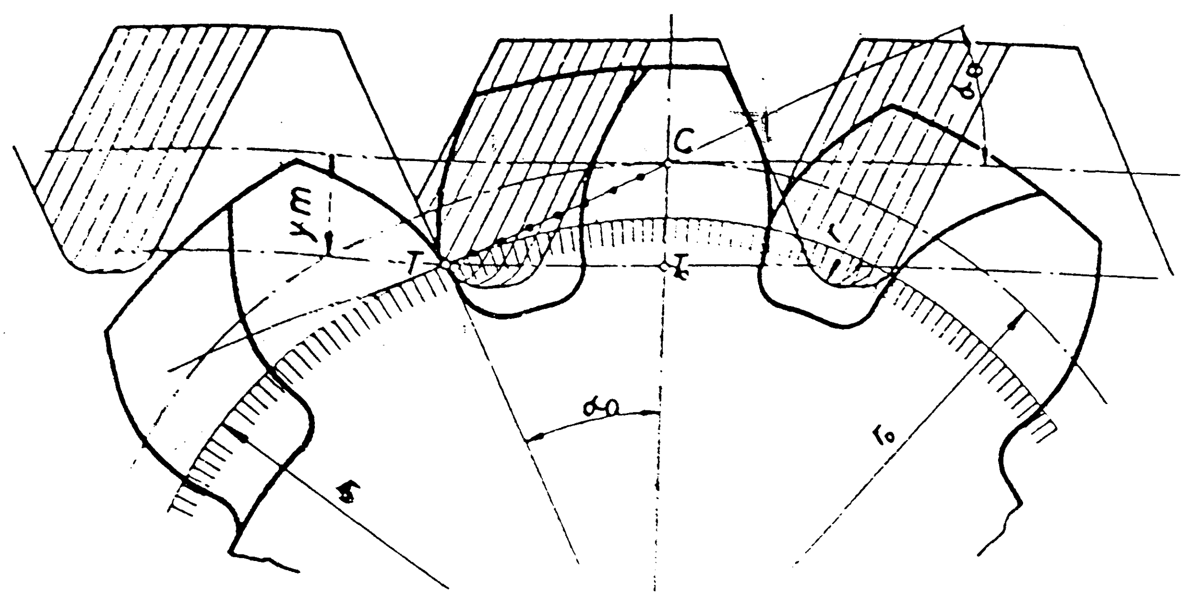
Slika 100.1


O₁
ω₁
r_{b1}
r_{f1}
r_{01}
r_{k1}
h_k
a_0
T_1
A
α_0
2
C
1
E
$b \cdot \tan\beta_0$
t_g
$b \cdot \tan\beta_b$
dolžina ubirnega polja
ω_2
T_2
h_k
r_{b2}
r_{f2}
r_{k2}
r_{02}
b
smer
notranja dotikalnica
dotikalnica
β_b
O_2
začetek ubiranja
ubirno polje
konec ubiranja

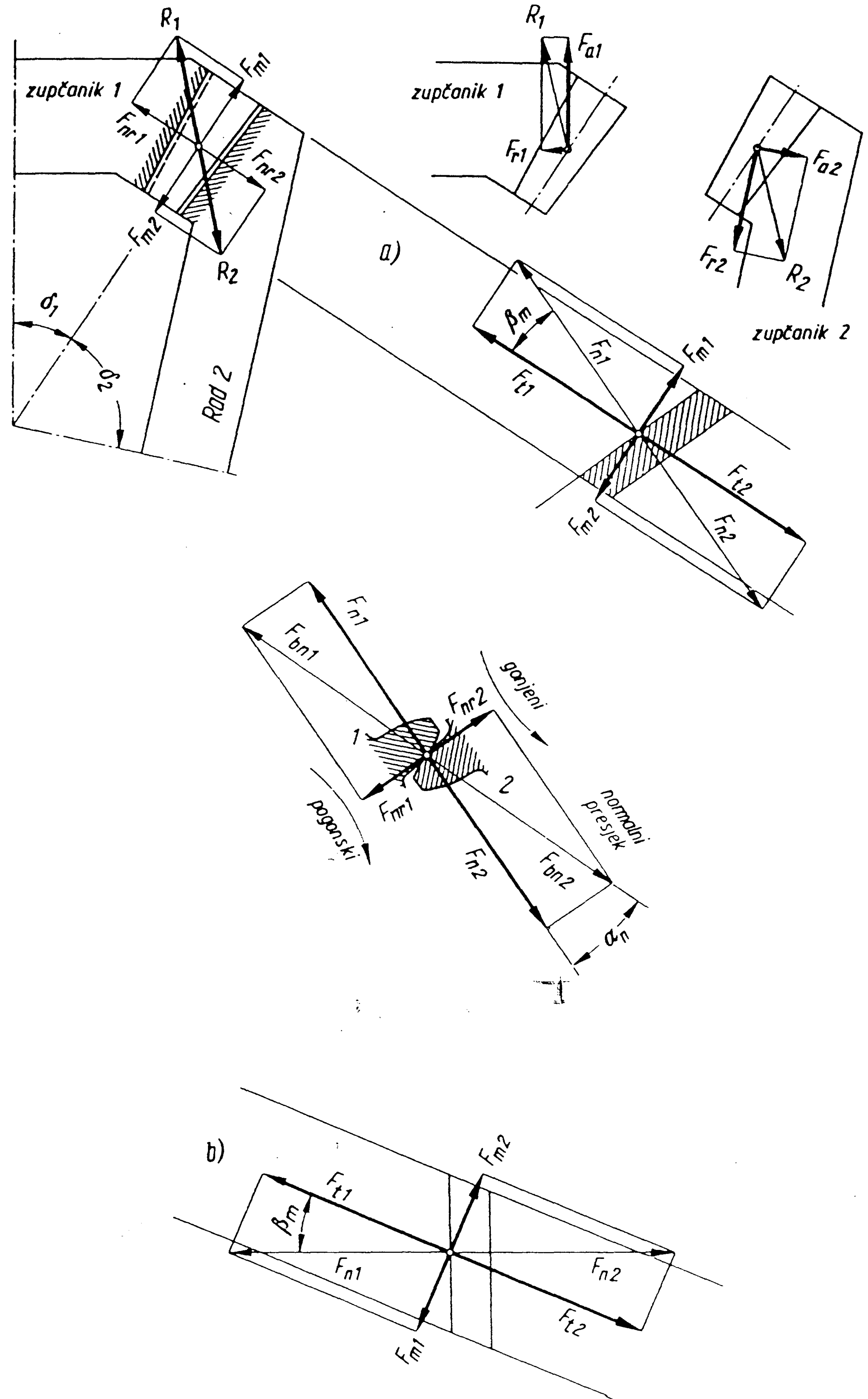
Slika 103.1



Slika 108.1



Slika 104.1



Slika 388. Odnosi sila na paru stožnika s kosim zubima

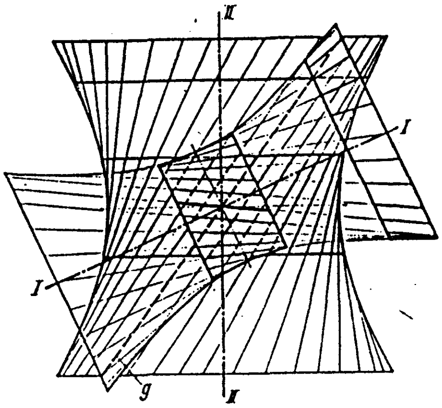


Abb. 6.81. Paarung zweier Drehungshyperboloide
g = erzeugende Gerade; $I-I$ = Drehachse des oberen (Ritzel-) Grundkörpers; $II-II$ = Drehachse des unteren (Rad-) Grundkörpers

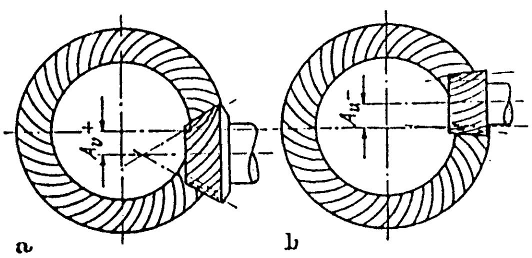


Abb. 6.82. Schraubenkegelrädergetriebe (AVAU-Spiralkegelräder, Klingelnberg)
a) Achsversetzung *in* Richtung der Spirale (positive Achsversetzung); b) Achsversetzung *gegen* die Spiralrichtung (negative Achsversetzung) (aus W. KRUMME, Klingelnberg-Spiralkegelräder)

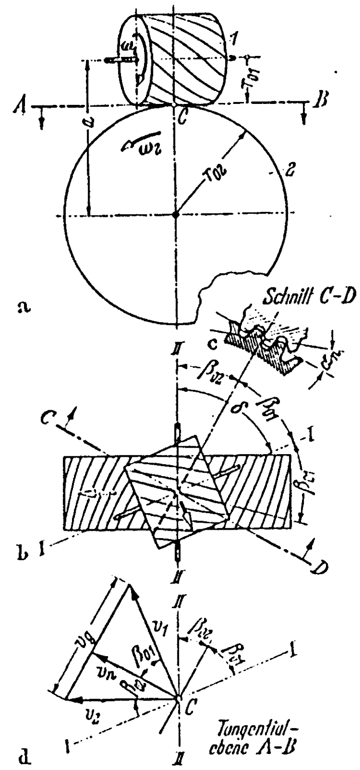


Abb. 6.83. Schraubenstirnrädergetriebe
a) Ansicht von vorn; b) Draufsicht; c) Normalschnitt; d) Geschwindigkeiten

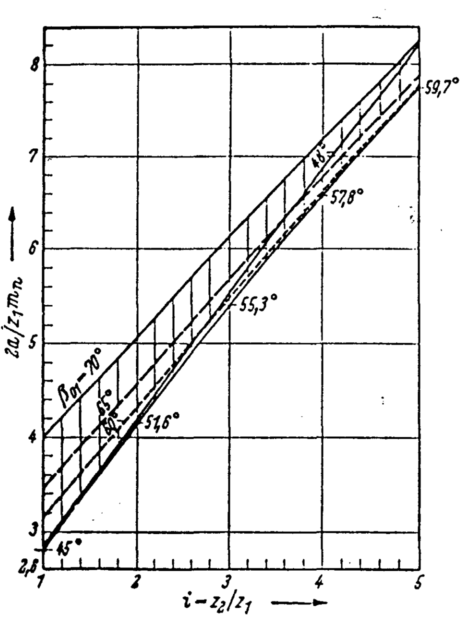


Abb. 6.84. Bereich der $\frac{2a}{z_1 m_n}$-Werte in Abhängigkeit vom Übersetzungsverhältnis $i = z_2/z_1$ für $\delta = 90°$

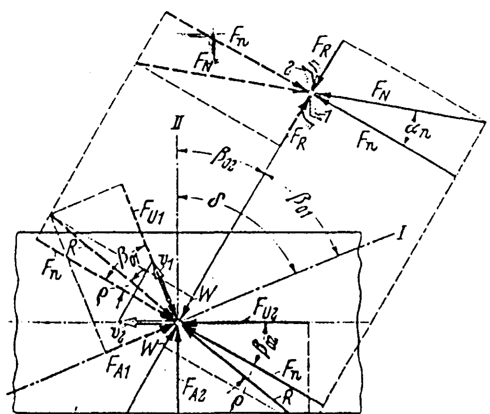
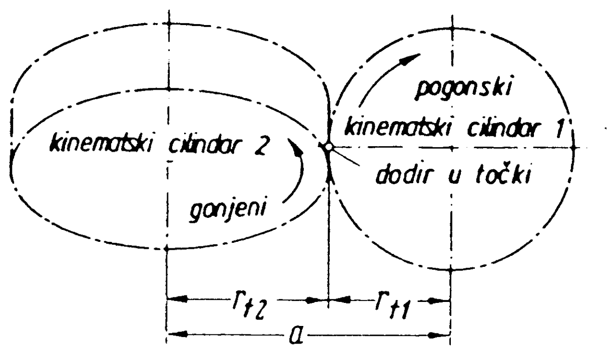
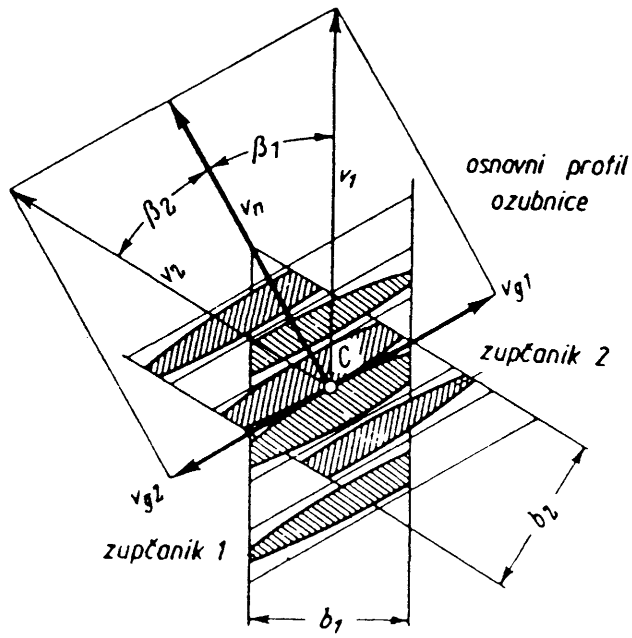


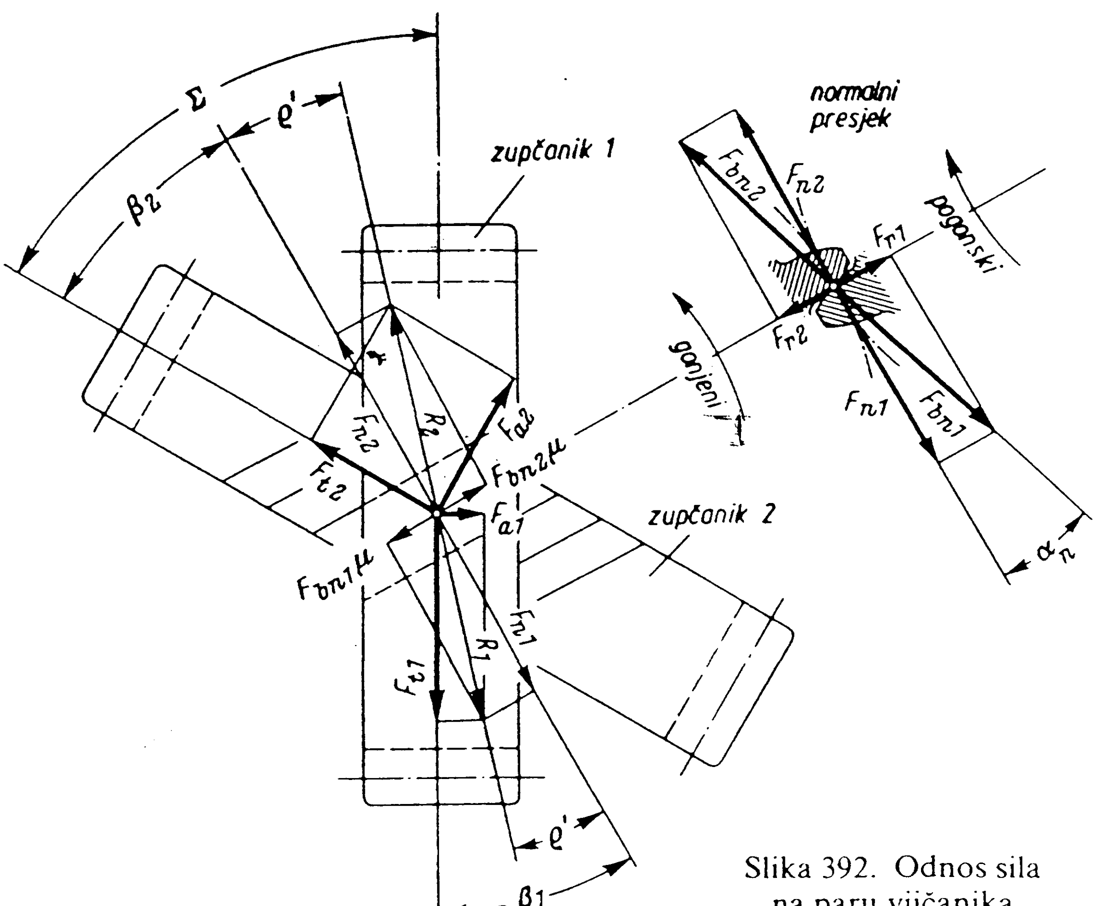
Abb. 6.85. Kräfte an Schraubenstirnrädern
1 = treibendes Rad; 2 = getriebenes Rad; I, II = Drehachsen



Slika 390. Dodir u točki kinematskih cilindara



Slika 391. Odnosi obodnih brzina i brzina klizanja



Slika 392. Odnos sila na paru vijčanika

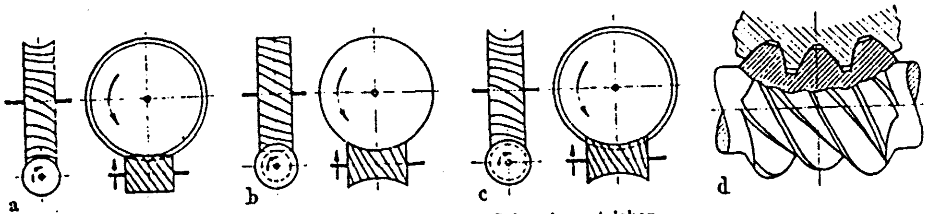


Abb. 6.88. Bauarten von Schneckengetrieben
a) Zylinderschneckengetriebe; b) Globoidschnecke und Schrägstirnrad; c und d) Globoidschneckengetriebe (d Bauart Bostock-Renk)

$$\boxed{H = z_1 t_a}.$$

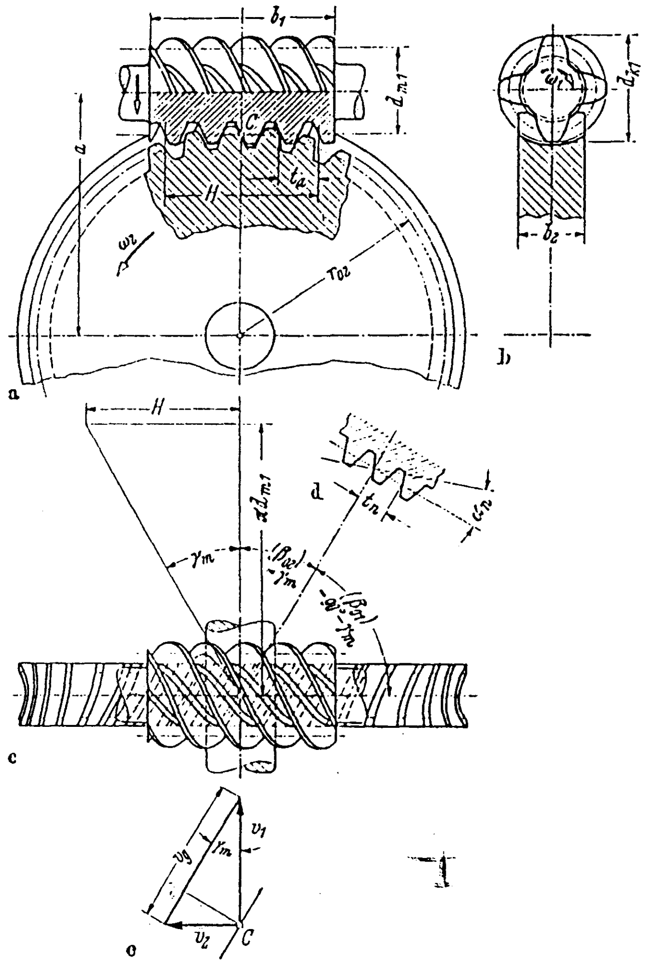


Abb. 6.89. Bezeichnungen und Bestimmungsgrößen am Zylinderschneckengetriebe
a) Achsschnitt der Schnecke; b) Seitenansicht der Schnecke; c) Draufsicht; d) Normalschnitt; e) Geschwindigkeiten

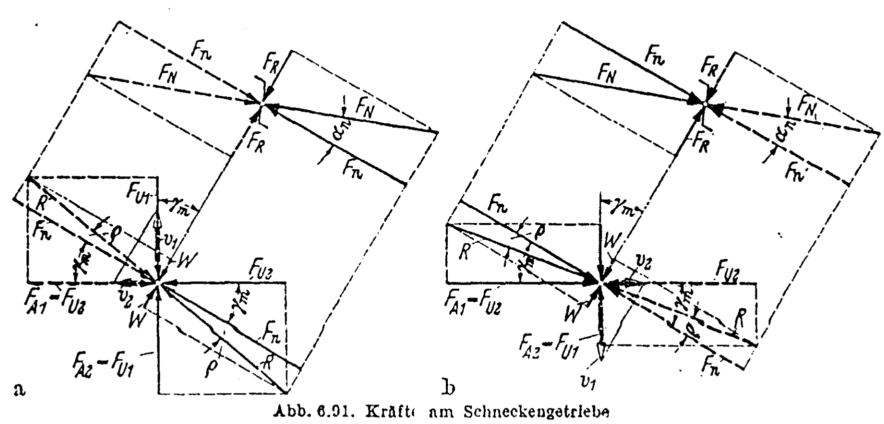


Abb. 6.91. Kräfte am Schneckengetriebe
a) bei treibender Schnecke b) bei treibendem Schneckenrad

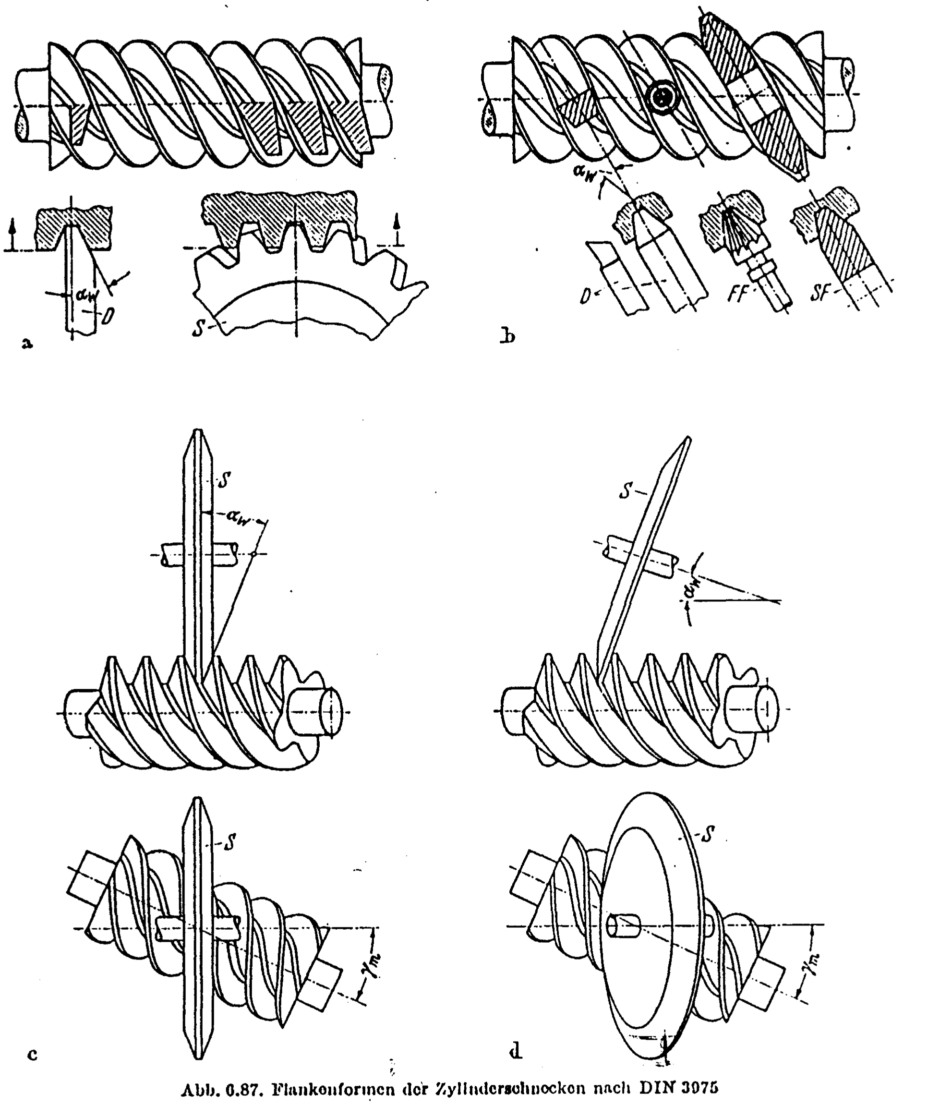
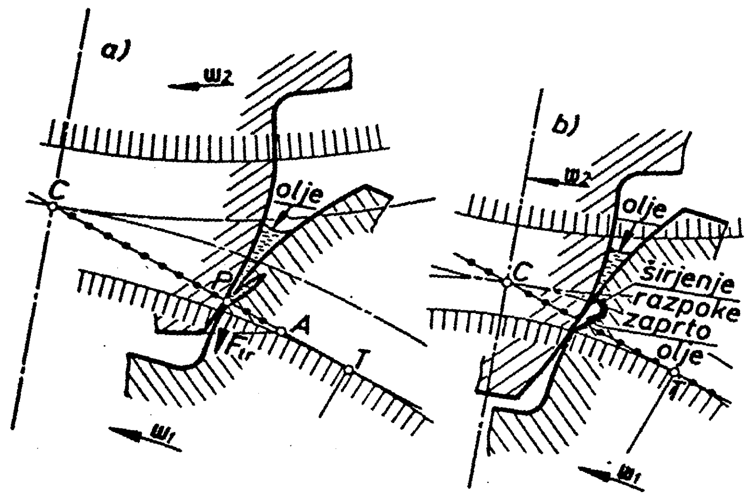
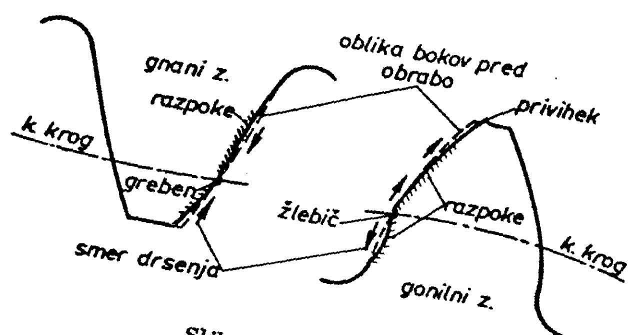


Abb. 6.87. Flankenformen der Zylinderschnecken nach DIN 3975

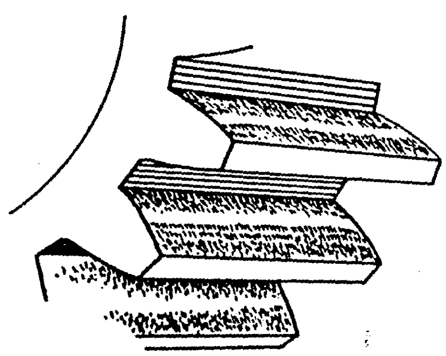
a) Flankenform A (ZA-Schnecke); *D* Drehmeißel; *S* Schneidrad; b) Flankenform N (ZN-Schnecke); *D* Drehmeißel; *FF* Fingerfräser; *SF* Scheibenfräser; c) Flankenform K (ZK-Schnecke); *S* Schleifscheibe; d) Flankenform E (ZE-Schnecke); *S* Schleifscheibe



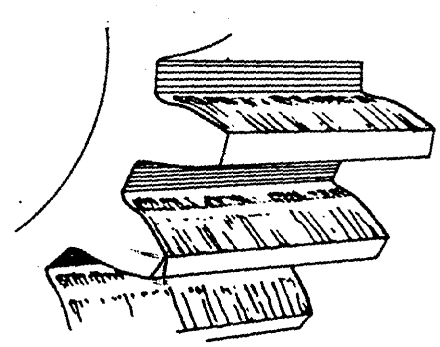
Slika 188.1



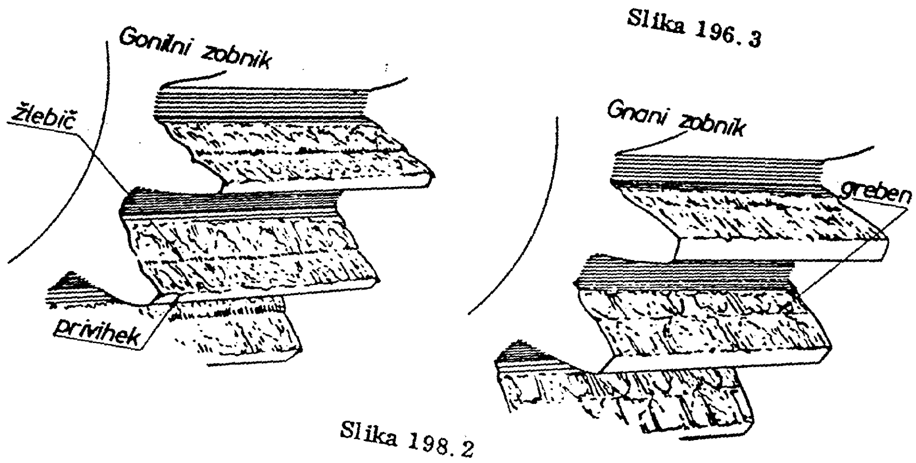
Slika 198.1



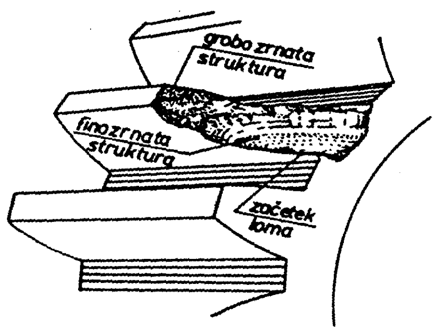
Slika 196.2



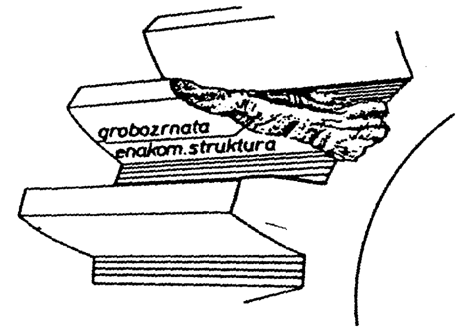
Slika 196.3



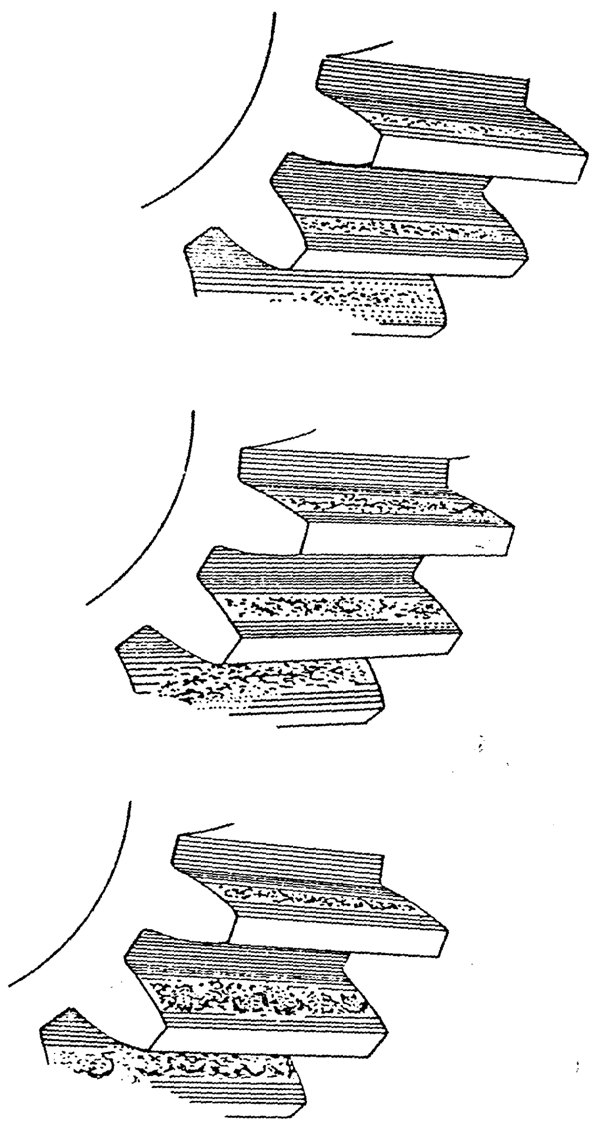
Slika 198.2



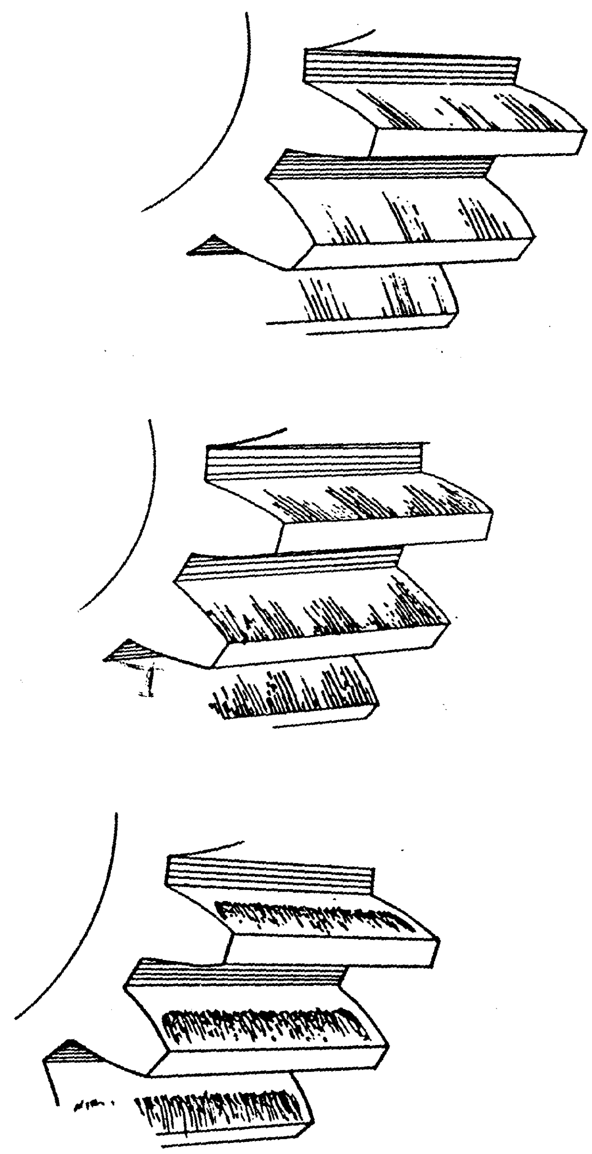
Slika 186.1



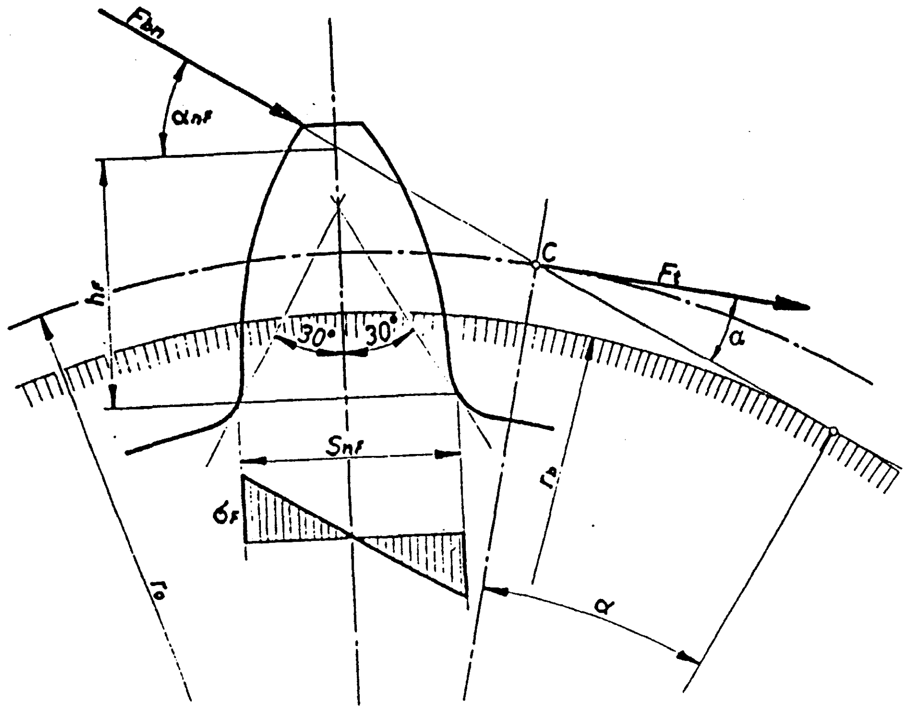
Slika 187.1



Slika 193.1 do 193.3



Slike 195.1 do 195.3



A Imenske

B Obodne sile

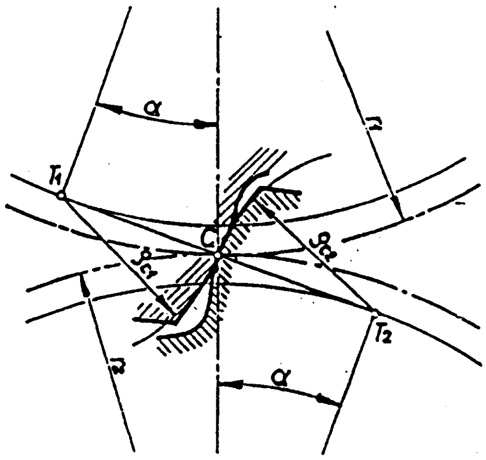
C

$$\sigma_F = \frac{F_t}{b \cdot m_n} \cdot Y_F \cdot Y_S \cdot Y_\beta \cdot K_A \cdot K_v \cdot K_{F\alpha} \cdot K_{F\beta} \leq \sigma_{FP}$$

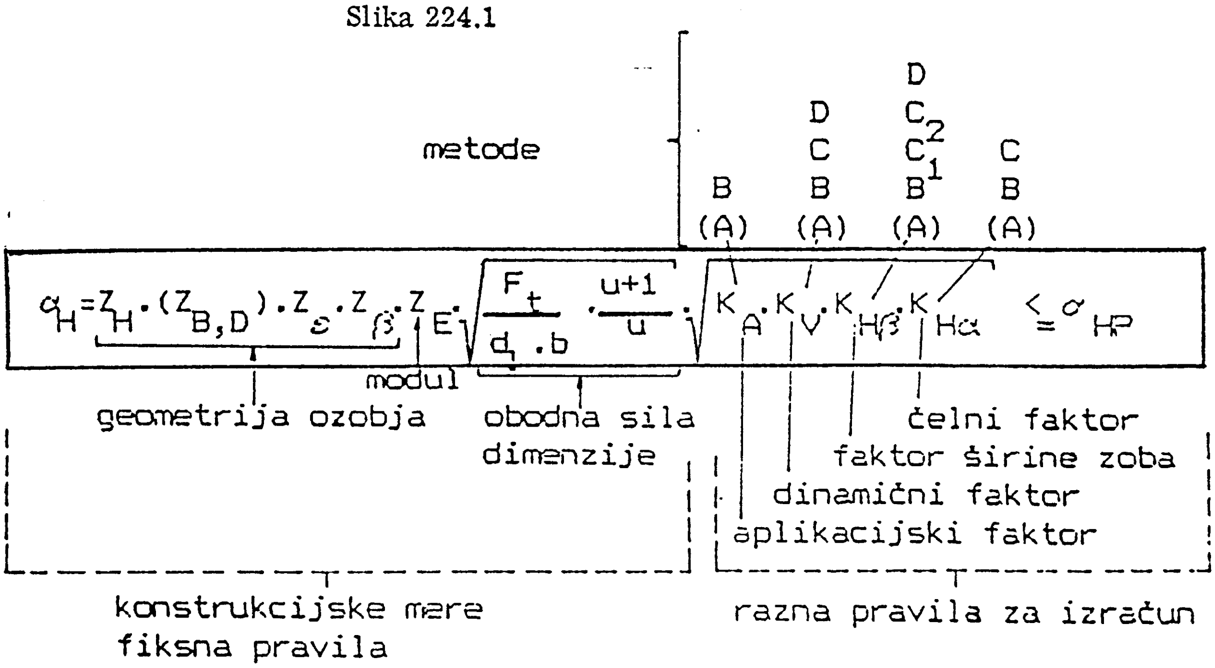
- F_t – Obodne sile
- m_n – modul
- b – širina
- Y_F – oblika
- Y_S – konc.napetosti
- Y_β – poševnost
- $K_A \cdot K_v \cdot K_{F\alpha} \cdot K_{F\beta}$ – dodatna obremenitev
- σ_{FP} – dopustna napetost

$$\sigma_{FP} = \frac{\sigma_{lim} \cdot Y_{st} \cdot Y_{Nt}}{S_{min}} \cdot Y_\delta \cdot Y_R \cdot Y_X$$

- σ_{lim} – trajna trdnost
- Y_{st} – velikost
- Y_{Nt} – časovna trdnost
- S_{min} – varnost
- Y_δ – občutljivost materiala
- Y_R – hrapavost
- Y_X – velikost



Slika 224.1



faktorji Z_{NT}, $(Z_L \cdot Z_V \cdot Z_R)$, Z_X za trajno trdnost