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TARKIBLI DISKRETLOVCHI BARABANCHA TISHLI GARNITURASI TEBRANISHLARINI UNING PARAMERTLARIGA BOG‘LIQLIGI TAHLILI

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Tavsiya etilgan diskretlovchi barabancha tishli garnituralari qayishqoq vtulka orqali uning valiga o‘rnatilgan. Bunda tishli garnitura 3ta bir xil qismlarga bo‘lingandir. Buning natijasida har bir tishli garnitura pilta tolalari bilan ta’sirlashganda ham aylanma, ham vertikal yo‘nalishlarda tebranadi. Ushbu tebranishlar aylanishlar amplitudalari juda kichik bo‘lsa ham, tolalar to‘g‘rilanadi va parallellashiga olib keladi. Shuning uchun diskretlovchi barabanchalarni vertikal tebranishlarini tahlili muhim hisoblanadi. [1].

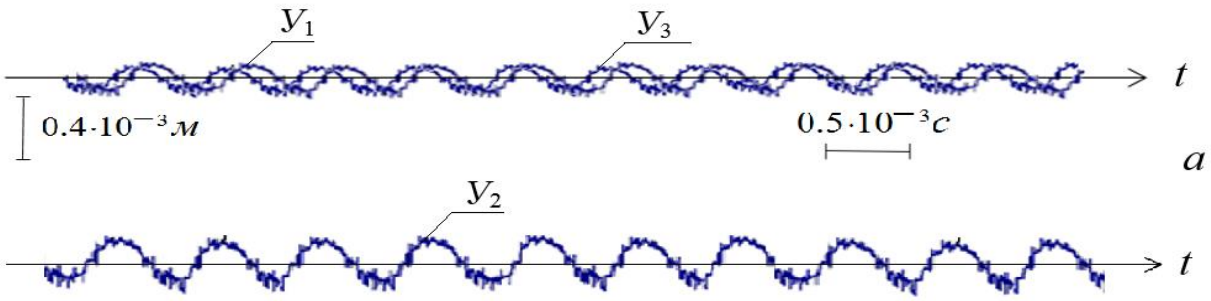
Diskretlovchi barabancha tishli garnituralarini tebranish qonuniyatlarini olish uchun keltirib chiqarilgan ifodali sonli yechimini har bir tishli garnitura uchun alohida amalga oshirildi [2]. Hisoblash parametrlarining quyidagi qiymatlarida amalga oshirildi:

$$m_2 = (1.2 \div 1.8)\cdot 10^{-2}\,кг; \qquad n_д = (6.0 \div 7.5)\cdot 10^{-3}\,айл/мин;$$

$$F_1 = (12 \div 24)\,cH; \qquad F_0 = (2.3 \div 4.5)\,cH; \qquad \delta F_1 = (0.25 \div 0.65)\,cH;$$

$$c = (0.08 \div 0.35)\cdot 10^3\,H/м; \qquad в = (1.3 \div 2.5)\,Hc/м;$$

Olingan qonuniyatlarda diskretlovchi barabancha har uchchala tishli garnituralari vertikal siljish qonuniyatlari alohida belgilandi (1-rasm, U_1, U_2, U_3, grafiklari). 1-rasmda tavsiya etilgan tarkibli diskretlovsi barabancha tishli garnituralarini vertikal tebranish qonunlarini texnologik va yuritgich aylanish chastotasiga bog‘liqligi keltirilgan. [3]. Olingan qonuniyatlar tahliliga ko‘ra diskretlovchi barabancha o‘rta qismidagi tishli garniturani tebranish amplitudasi qachon chetki tishli garnituralar tebranishlari amplitudalaridan $(15 \div 20)\%$ gacha yuqoriligi aniqlandi. [4]. Buning asosiy sababi $F_2 = 1.2F_1 = 1.2F_3$ qilib olinganligi, ya’ni o‘rtadagi tishli garnituraga ta’sir qiluvchi texnologik qarshilikning kattaligi hisobidir. [5].

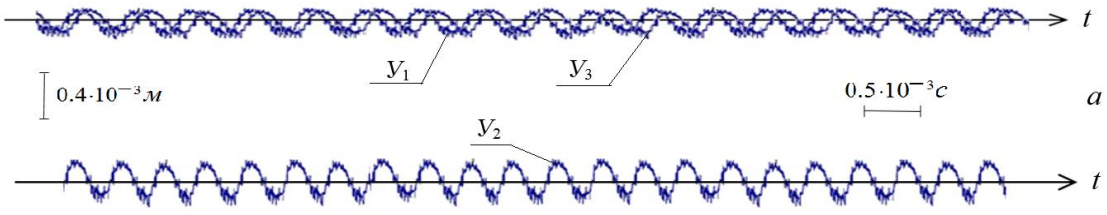


$F_л = (12 + 2.3\sin\omega t \pm 0.25)cH;$ $c = 0.25\cdot10^3$ N/m;

$n_д = 6\cdot10^3$ ayl/min; $в = 2.5$ Ns/m;

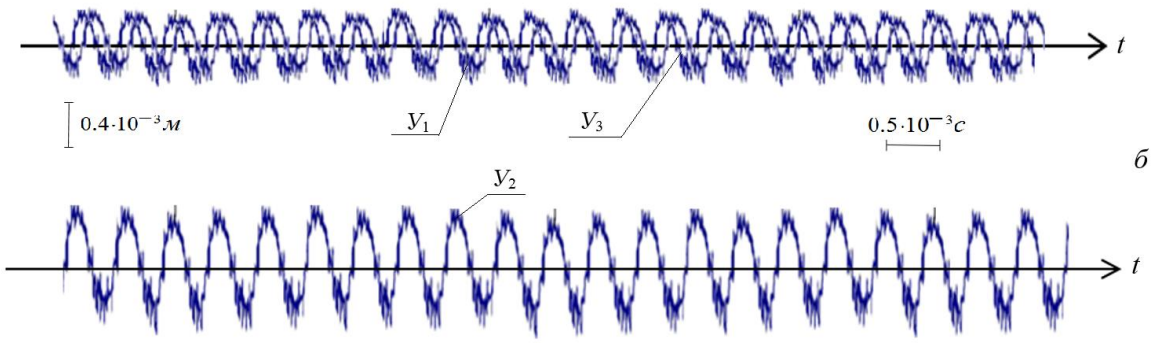
1-rasm. Tavsiya etilgan tarkibli diskretlovchi barabancha tishli garniturlarining vertikal tebranish qonunlarini texnologik va yuritgich aylanish chastotasiga bog‘liqlik qonuniyatlari keltirilgan

Chunki o‘rta zonada pilta tolalari zichligi yuqoriroq bo‘ladi. Ta’kidlash lozimki, U_1, U_2, va U_3, larning tebranish amplitudalari garnituralar o‘rnatilgan rezinali vtulkalarning chiziqli bikrlik koeffitsiyentlariga ham bog‘liq bo‘ladi. 1-rasmdagi qonuniyatlardan ko‘rinib turibdiki, texnologik qarshilikni ortishi bilan tishli garnituralarning tebranish amplitudalari ham mos ravishda ortib boradi (1-rasm, *a*,*b*,*v*-grafiklar). Ularning tebranish chastotalari barqaror harakat vaqtida yuritgichning aylanish chastotasiga deyarli mos keladi. Bunda tebranish chastotasining qiymati $1.22\cdot10^2$ Gs ga teng bo‘ladi. Mos ravishda yuritgich aylanish chastotasi $7.5\cdot10^3$ ayl/min gacha orttirilganda, tishli garnituralarning tebranish chastotalari proporsional ravishda ortadi va $1.42\cdot10^2$ Gs ga teng bo‘ldi (2-rasm, *a*,*b*,*v*-grafiklar). Bunda diskretlovchi barabanchani har uchchala tishli garnituralarini tebranish amplitudalari qiymatlari ta’siri deyarli o‘zgarmaydi.



$F_л = (12 + 3.35\sin\omega t \pm 0.25)cH;$ $c = 0.25\cdot10^3$ N/m;

$n_д = 7.5\cdot10^3$ ayl/min; $в = 2.1$ Ns/m;



$F_{л} = (18 + 3.35\sin\omega t \pm 0.45)cH;$ $c = 0.25\cdot10^{3}\,\text{N/m};$

$n_{д} = 7.5\cdot10^{3}\,\text{ayl/min};$ $в = 2.1\,\text{Ns/m};$

2-rasm. Tavsiya etilgan tarkibli diskretlovchi barabancha tishli garnituralarining vertikal tebranish qonunlarini texnologik va yuritgich aylanish chastotasiga bog‘liqligi keltirilgan

Lekin o‘rta qismdagi tishli garniturani tebranish qamrovi, $F_2 = 12\cdot F_1$ bo‘lagi uchun tebranish qamrovi qiymatlari kattaroq bo‘ladi. Mos ravishda $\Delta Y_1 = \Delta Y_3$ ning qiymatlari $0.485\cdot10^{-3}$m dan $1.42\cdot10^{-3}$m gacha nochiziqli qonuniyatda ortib boradi. Qayd etish lozimki, o‘rtadagi tishli garnitura tebranishlarining qamrovi qiymatlari mos ravishda $F_1 = (12 + 2.3\sin\omega t \pm 0.25)$ sN bo‘lganda ΔY_2 qiymatlari $0.138\cdot10^{-3}$m dan $0.79\cdot10^{-3}$m gacha chiziqsiz qonuniyatda ortib boradi. [6].

Texnologik qarshilik F_1=24.0 sN bo‘lganida ΔY_2 qiymatlari $0.54\cdot10^{-3}$ m dan $1.62\cdot10^{-3}$ m gacha ko‘payib boradi. Tajribaviy tadqiqotlar natijasiga ko‘ra tishli garniturani vertikal tebranishlari, shuningdek, garnitura tishlarining o‘zaro farqi $(1.0\div1.2)\cdot10^{-3}$ m dan oshmasligini ta’minlash uchun yuritgich aylanish chastotasi $(7.0\div7.5)\ 10^{-3}$ ayl/min oralig‘ida tanlash maqsadga muvofiqdir. Lekin amortizatorning bikrligini mos qiymatlarini tanlash hisobiga p_d qiymatlarini $(10\div12)\cdot10^{3}$ ayl/min gacha ortishi mumkin bo‘ladi.

Foydalanilgan adabiyotlar ro‘yxati.

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