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**KARYERLARDA BURG‘ILAB – PORTLATISH ISHLARIDA ATMOSFERA
CHANGLANISHINI KAMAYTIRISH MEXANIZMLARI.**

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“Umumtexnik fanlar” kafedrası o‘qituvchisi

Annotatsiya: Maqolada karyer sharoitida portlatish skvajinalarini burg‘ilash jarayonida yuzaga keladigan changni kamaytirish va bostirish usullari tahlil qilinadi. Mexanik burg‘ilash usullarida, xususan, sharoshkali va zarba-aylanma stanoklarda qo‘llaniladigan changga qarshi kurash usullari – ho‘l chang bostirish, havo-suv aralashmalari, chang tutish qurilmalari (siklon, filtr, yengsimon filtrlar) va ko‘p bosqichli tizimlar haqida batafsil ma‘lumot beriladi. Burg‘ilash jarayonida changning havo tarkibidagi konsentratsiyasini kamaytirishga qaratilgan texnologiyalar samaradorligi amaliy misollar va jadval asosida ko‘rsatib o‘tilgan. Shuningdek, havo tarkibini tozalash uchun ishlatiladigan filtrlar konstruksiyasi va ularning ishlash prinsiplari yoritilgan.

Kalit so‘zlar: Skvajina, burg‘ilash, chang bostirish, ho‘l chang bostirish, havo-suv aralashmasi, chang tutish qurilmasi, yengsimon filtr, sharoshkali stanok, chang konsentratsiyasi, havo tozalash.

Kirish: Karyerda portlatish skvajinalarini burg‘ilashda qo‘llanadigan burg‘ilash usullarini ikki asosiy guruhga ajratish mumkin: mexanik va termik. Sharoshkali va zarba-aylanma prinsipda ishlaydigan stanoklar mexanik guruhga tegishli.

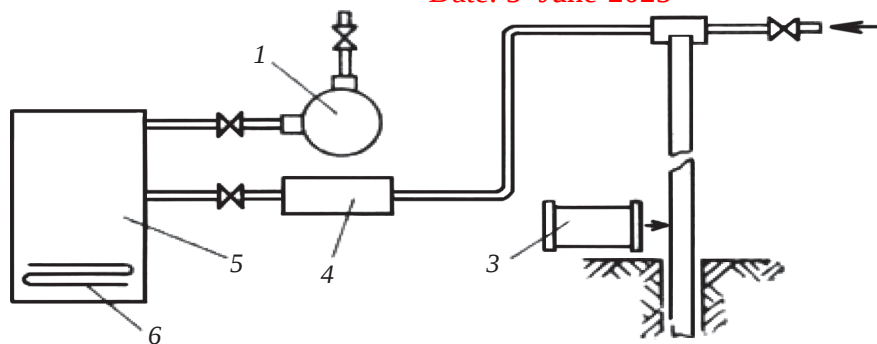
Mexanik usulda kon jinslarini yemiruvchi burg‘ilash stanoklari ishlayotganda karyer atmosferasiga ajralib chiqadigan changni kamaytirish uchun burg‘ilashni maxsus dolotolar bilan olib borish, samarali changni tutib oluvchi qurilmalarni yaratish (gravitatsion, inersion, suyuqlikli va g‘ovakdor chagtutgichlardan tashkil topgan) va ho‘llovchi chang bostirish usullari (suv, aeratsiyalangan eritmalar, suv-havo aralashmasi va ko‘pik) kabi boshqa omillardan foydalaniladi.

Hozirgi vaqtda sharoshkali stanoklar bilan burg‘ilashda ho‘l chang bostirish usuli va chang tutish qurilmalarini qo‘llash asosida karyer atmosferasiga chang ajralib chiqishini kamaytirish changga qarshi kurashishning asosiy yo‘nalishlari hisoblanadi.

Stanoklardagi havo-suv aralashmasi siqilgan havo oqimiga suv yuborilganda suvni mayda tomchilarga parchalanishi natijasida hosil bo‘ladi (4.1-rasm).

Suv bilan ho‘llangan chang zarrachalari og‘irlik kuchi siqib havo oqimidan ajralib chiqib, skvajinadan ma‘lum masofada pog‘ona ustki maydoniga o‘tiradi.





1-rasm. SBSH-250 stanoklarida havo-suv aralashmasi bilan chang bostirishning prinsipial sxemasi: 1 – nasos; 2 – kompressordan kelayotgan siqiq havo; 3 – ventilator; 4 – nasos; 5 – suv baki; 6 – elektr qizdirgich.

Chang bostirishga sarflanadigan suv q_s (kg/m) yoki q_b (kg/s) quyidagi ifodalardan biri orqali aniqlanadi:

$$q_s = \frac{\pi d^2 \cdot \gamma_{b.n} (\omega_l - \omega_t)}{4 \cdot 100}; \quad q_b = \frac{\pi \cdot v_b \cdot d_s^2 \cdot \gamma_{b.n} (\omega_l - \omega_t)}{4 \cdot 100};$$

bunda d_s – skvajina diametri, m; $\gamma_{b.n}$ – burg‘iladigan jins zichligi, kg/m³; ω_l – burg‘ilash kukunining yopishqoqligini hisobga olingandagi optimal namligi, %; ω_t – burg‘iladigan jinsning tabiiy namligi, %; v_b – skvajinani burg‘ilash tezligi, m/s.

Suvning ho‘llash xususiyatini oshirish uchun unga suv sathi tarangligini kamaytirib, uning ho‘llovchanlik xususiyatini yaxshilash hisobiga zarrachalarning yoyilishini ta‘minlovchi moddalar qo‘shiladi. Bu esa havo tarkibidagi chang konsentratsiyasini kamaytiradi (4.1- jadval).

Havo-suv aralashmasi bilan changni bostirish usuli yuqori samaradorlikka ega bo‘lsada, ba’zi bir kamchiliklardan ham xoli emas. Masalan, doloto o‘tmaslanishini tezlatadi, qish faslida suvdan foydalanish imkoniyatini pasaytiradi, skvajina og‘zining buzilishiga olib kelishi mumkin va h.k.

Sharoshkali va zarba-aylanma burg‘ilash stanoklarini ekspluatatsiya qilish davomida ko‘plab bir, ikki, uch va to‘rt bosqichli chang bostiruvchi qurilmalar yaratilgan. Bu qurilmalar skvajina og‘zidan changlangan havoni so‘rib olish uzeliidagi (o‘ramadagi) chang tutish apparatlari, ventilator va havo haydash tizimidan tashkil topadi.

1-jadval

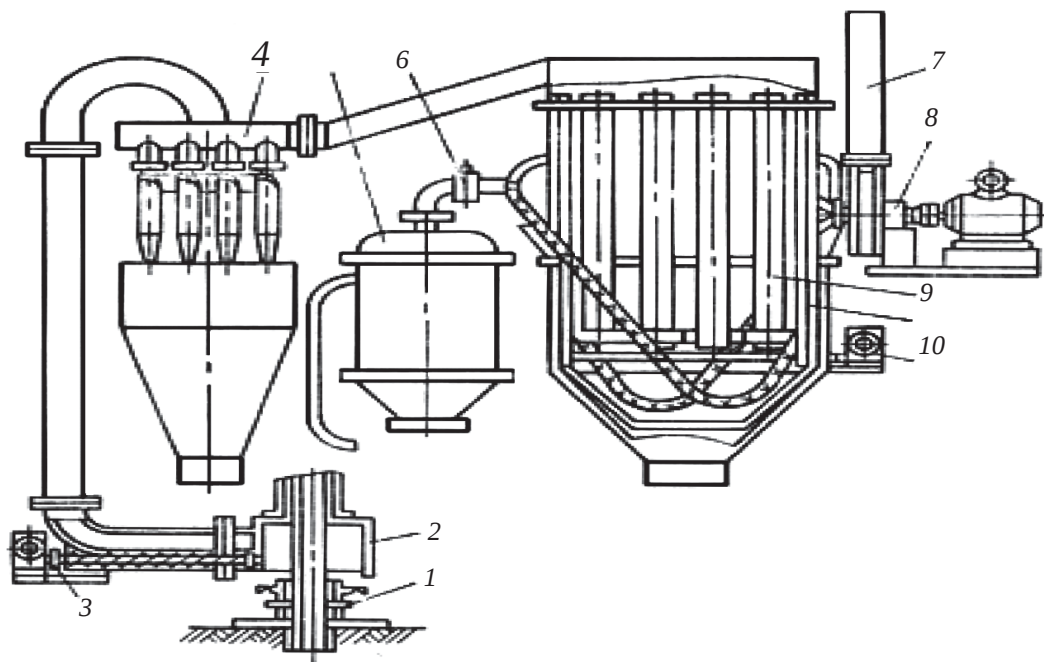
Chang bostirish usuli	Namuna olish joyi	Changning o‘rtacha konsentratsiyasi, mg/m ³
Chang bostirilmaganda	Ish maydonchasida	192,8
	Stanok mashinisti kabinasida.....	56,2
Havo-suv aralashmasi	Ish maydonchasida.....	4,9
	Stanok mashinisti kabinasida.....	2,4
Havo-emulsiya aralashmasi	Ish maydonchasida	1,8
	Stanok mashinasi kabinasida.....	0,8

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Quruq va ho'l chang bostirish usullarida chang tutish qurilmalaridan ham foydalaniladi. Bunda burg'ilash quyqasi chang yig'gich orqali o'lchami $1,0 \times 1,5 \times 2,8$ m bo'lgan cho'ktirish kamerasigatushadi. Yirik zarralardan tozalangan havo diametri 0,45 m ga teng bug' gidrosikloni va filtrlash maydoni 50 m^2 bo'lgan matoli yengsimon filtrga o'tadi. Bunday qurilmadan foydalanganda changlanish intensivligi 10 barabar pasayib, havoning changdorligi $0,6-6,9 \text{ mg/m}^3$ gacha kamayadi. Chang tutish qurilmalarini takomillashtirish yo'nalishlaridan biri (burg'ilash stanoklari uchun) ko'p qatlamli matoga teskari yo'nalishda uzlukli yoki struyali puflash usullarini qo'llashdan iborat (4.2- rasm). Bu qurilma qo'llanganda tizimning turg'un aerodinamik qarshiligiga ega bo'lgan, tarkibida 20 mg/m^3 gacha qoldiq changli chiqish havosining matoga beradigan bosimi 3 martagacha ko'payishi mumkin.

Bu qurilma burg'ilash kukunidagi yirik changlarni cho'ktirish (o'tqazish) uchun chang qabul qilish separatori, yirik chang zarrachalarini tutib qolish uchun QN-5 rusumli 8 ta siklonlar batareyasi va havoni mayda chang zarrachalarini tozalash uchun matoli yengsimon filtrdan tashkil topgan bo'ladi.



2-rasm. Sharoshkali burg'ilash stanoklari uchun chang tutish qurilmasi konstruksiyasining sxemasi: 1 – markazdan qochirish qurilmasi; 2 – chang qabul qilish kamerasi; 3 – shnek; 4 – siklon batareyasi; 5 – havo yig'gich; 6 – elektromagnit ventili; 7 – chiqarish trubkasi; 8 – ventilator; 9 – yengsimon filtr; 10 – puflash qurilmasi; 11 – elektr dvigateli reduktori bilan.

Yengsimon matoli filtr – filtrlash maydoni 18 m^2 , uzunligi 2 m va diametri 0,35 m bo'lgan 8 ta yengdan iborat bo'lib, matoning regenatsiyasi siqiq havoning teskari oqimi yo'nalishida harakatlanishi mobaynida, avtomatik ravishda sodir bo'ladi. Ushbu qurilmani ishlab chiqarish sharoitida sinab ko'rilganda havoni changdan tozalash darajasi 99,5 % ni tashkil qilgan.

Xulosa: Karyer sharoitida skvajina burg'ilashda hosil bo'ladigan chang ishchi salomatligi va atrof-muhit uchun xavf tug'diradi. Bu muammoni hal etishda ho'l chang

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bostirish va ko'p bosqichli chang tutish qurilmalarini qo'llash muhim rol o'ynaydi. Havosuv aralashmalari asosida changni bostirish usuli yuqori samaradorlikka ega bo'lib, havodagi chang miqdorini sezilarli darajada kamaytiradi. Shu bilan birga, filtr tizimlarini takomillashtirish, avtomatlashtirish va regeneratsiya imkoniyatlarini kengaytirish changga qarshi kurash samaradorligini yanada oshiradi. Bunday kompleks yondashuvlar ishlab chiqarishda xavfsizlikni ta'minlab, ekologik barqarorlikka erishish imkonini beradi.

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