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Seeder for Sowing Non-Flowing Seeds of Plants

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Annotation: The article presents the modern problem of the Aral Sea, which needs to be solved urgently in the international plan, indicates the possibility of smoothing the negative consequences of the Aral Sea by forest plantations on the drained bottom of the sea. The analysis of the scatter method is given. The design of the existing SLP-M seeder used in forest nurseries is analyzed, the disadvantages of which are the complexity of the design and the impossibility of its use for sowing seeds on large areas with wide rows and large intervals between them. Considering the above, a single-row seeder has been developed for sowing saxaul seeds. It consists of a frame, a seed box, two support-drive wheels. A seeding coil is installed at the bottom of the seed box. A lever is installed on the axis of the two support-drive wheels, which rotates the seeding coil once at each rotation of the wheels, thereby ensuring sowing seeds with an interval of length equal to the circumference of the support wheels. It is known that the problem of the Aral Sea in the international plan is among the priority tasks that need to be solved urgently, the consequences of which are continental in nature. Smoothing out the negative consequences of the Aral Sea can be achieved only by means of forest plantations on the drained bottom of the sea. Desert plants like kandym, saxaul and cherkez are used for this.

Saxaul plantation fix the sands, reduce wind-borne sediments, improve water infiltration into the soil and improve its structure.

It is known that the problem of the Aral Sea in the international plan is among the priorities that need to be addressed urgently, the consequences of which are of a continental nature. Smoothing out the negative consequences of the Aral Sea can only be achieved through forest plantations on the drained bottom of the sea. To do this, use desert plants like kandym, saxaul and cherkez.

A saxaul plantation fixes the sands, reduces the sediment brought by the wind, improves the infiltration of water into the soil and improves its structure.

Currently, saxaul seeds are sown on the dried bottom of the Aral Sea in a scattered way with the help of aviation. In this case, there are large losses of expensive seed material, because seed germination with scattered sowing is much lower than when sowing them with embedding them in the soil.

According to the recommendations [1], saxaul seeds are planted in parallel rows, the distance between rows is 15 m, and between seeds in a row is 1 m.

However, designing a planter with wide row spacing is inefficient as it requires a lot of materials and construction and becomes bulky and metal intensive.

A well-known seeder for forest nurseries SLP-M for sowing non-friable seeds in narrow rows 30 cm wide [2].

The disadvantage of this seeder is the increased consumption of seed material, its complex design and the inability to use for sowing seeds on large areas with wide rows and large uniform intervals between them required when sowing seeds of woody and shrubby plants. In addition, in the process of work in the seed box above the seeding coil, an arch in the form of a void is formed and, therefore, seeds do not enter the seeding coil. Roof formation in a seed box or hopper is characteristic of non-seeding seeds, which are the seeds of saxaul kandym and cherkez. The diameters of the seeds of these plants are about 1 mm.

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Considering the foregoing, we have developed a single-row seeder [3] for sowing seeds of saxaul and other forest plantations with the lowest consumption of material over large areas at regular intervals. To prevent the formation of a vault above the seeding wheel, a vault destroyer is installed in the seed box.

The developed single-row seeder is shown in figure 1(рис.1.) in a longitudinal section;

in figure 2(рис.2.) - in a cross section along A-A;

figure 3(рис.3.) is a schematic diagram of the operation of the seeding spool drive of the seeder.

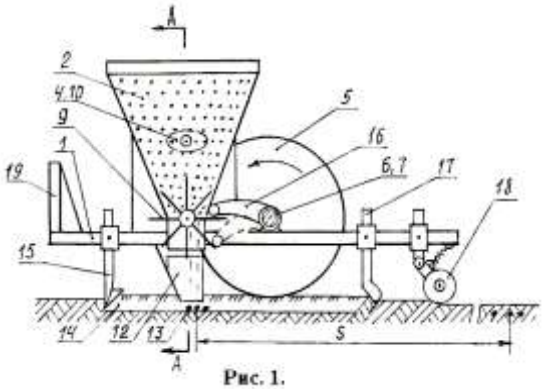

Рис. 1.

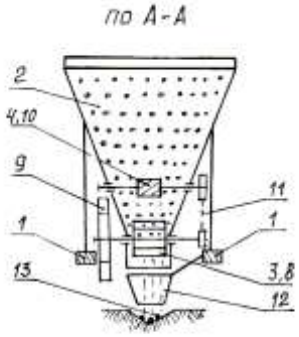

Рис. 2.

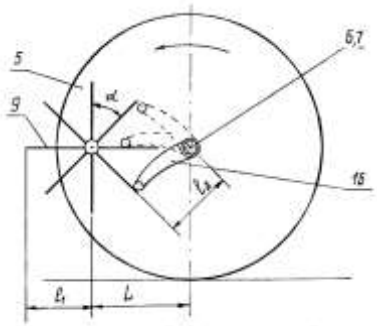

Рис. 3.

The seeder consists of a frame 1, a seed box 2 with a seeding coil 3 and a tedder 4 inside, right and left two support-drive wheels (for clarity of the drive of the seeding coil, only the right support wheel 5 is shown in the drawing) with an axis of rotation 6 on bearings 7. On the axis of rotation 8 of the sowing wheel 3 on the left side of the seed box 2, a wheel 9 is rigidly installed with blades of length ℓ1, evenly spaced around the circumference with angles α = 450 . The axes of rotation 8, 10 of the seeding coil 3 and the tedder 4 are connected by a chain transmission 11. Under the seed box 2 there is a vas deferens 12, made in the form of a flat funnel for directing the seeds 13 into the groove 14, cut with a furrow cutter 15. On the axis of rotation 6 of the support-drive wheels is rigidly attached one end of the lever 16, curved in the opposite direction of rotation of length ℓ2, the second free end of which has a rounded shape. Rotating axes 6 and 8 of support-drive wheels and seeding spool 3 lie on the same horizontal plane and the distance between them is L= 1.5 ℓ1. The sown seeds 13 are covered with soil with a harrow 17 and compacted with a roller 18. The seeder is equipped with an automatic hitch 19 in front.

The seeder works as follows. At the beginning of work, support-drive wheels with diameters corresponding to the seeding interval S are installed on the seeder. The seeder is coupled to the tractor using an automatic hitch 19. With the movement of the unit, the furrow cutter 15 cuts a groove 14 with a depth of 2-3 cm. The lever 16 rotates together with the axis of rotation of the 6 support-drive wheels and, after one of their revolutions (steps), it approaches the wheel 9 with blades, the free rounded end enters its sector and turns counter blade at α=450 clockwise. At the same time, the sowing wheel 3 and the tedder 4 are rotated through this angle with the help of a chain drive 11, which excludes arching over the sowing wheel. By turning the sowing wheel 3, seeds 13 are sown in the amount of 3-5 pcs. available in the groove (not shown in the drawings) of the coil 3 and they through the seed tube 12, made in the form of a flat funnel, fall to the

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bottom of the groove 14. The sown seeds 13 are planted with soil by the 17 harrow and compacted by the 18 roller.

Thus, the sowing of seeds is carried out in one revolution (step) of the support-drive wheels with an interval S = π D (where D is the diameter of the support-drive wheels), the consumption of seed material is reduced, the possibilities of using the seeder for sowing non-friable saxaul seeds and other forest plants over large areas at regular intervals.

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