

Implementation of the geoethics principal to environmental technologies by Biogeosystem Technique

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The uncertainty and degradation of biosphere is a result of outdated industrial technologies. The incorrect principals of the nature resources use paradigm are to be radically changed corresponding to principals of Geoethics. Technological dead-end is linked to Philosophy of Technology. The organprojektion and imitation of natural patterns are till now the theoretical base of technology. The technological and social determinism are proposed as the "inevitable" for humankind. One is forced to believe that the only way for humanity is to agree that the outdated way of technical development is the only possibility for humankind to survive. But rough imitation as a method of outdated technological platform is fruitless now. Survival under practice of industrial technology platform now has become extremely dangerous. The challenge for humanity is to overcome the chain of environmental hazards of agronomy, irrigation, industry, and other human activities in biosphere, which awkwardly imitate the natural processes:

- plowing leads to degradation of soil and greenhouse gases emission;
- irrigation leads to excessive moistening and degradation of soil, landscape, greenhouse gases emission, loss of freshwater – the global deficit;
- waste utilization leads to greenhouse gases emission, loss of oxygen and other ecological hazards.

The fundamentally new technologies are to be generates for development of biosphere, food and resources renewing. Aristotle told that techne can go beyond nature and implement "what nature can't bring to a finish." To overcome fundamental shortcomings of industrial technologies, incorrect land use we propose the Biogeosystem Technique (BGT*) for biosphere sustainability.

The BGT* key point is a transcendent approach (not simple imitating the natural processes) – new technical solutions for biosphere – soil construction, the fluxes of energy, matter, and water control and biological productivity of terrestrial systems. Intra-soil milling which provides the new soil dispersed system synthesis – biological productivity of soil increases twice; intra-soil pulse discrete plants watering which permits to save the freshwater – global deficit – up to 20 times, protect the soil and landscape from excess water, and optimize soil water regime for higher plant's productivity; environmentally safe return of the substances into the active stage of biosphere during synthesis of soil dispersed system and (or) intra-soil pulse discrete plant watering for proper waste recycling.

Intra-soil milling processing of the 20-50 cm soil layer provides mixing of illuvial and subsoil carbonate horizons, the new soil disperse system is formed. Soil particles from 1 to 3 mm in size match the rhizosphere development well. Soil structure optimizes for a long period of 30 years and more. Best conditions for techno-soil stable evolution and plant growth in period up to 40 years after the single processing. Soil productivity 30-80% higher. Profitability compared to standard technology is triple.

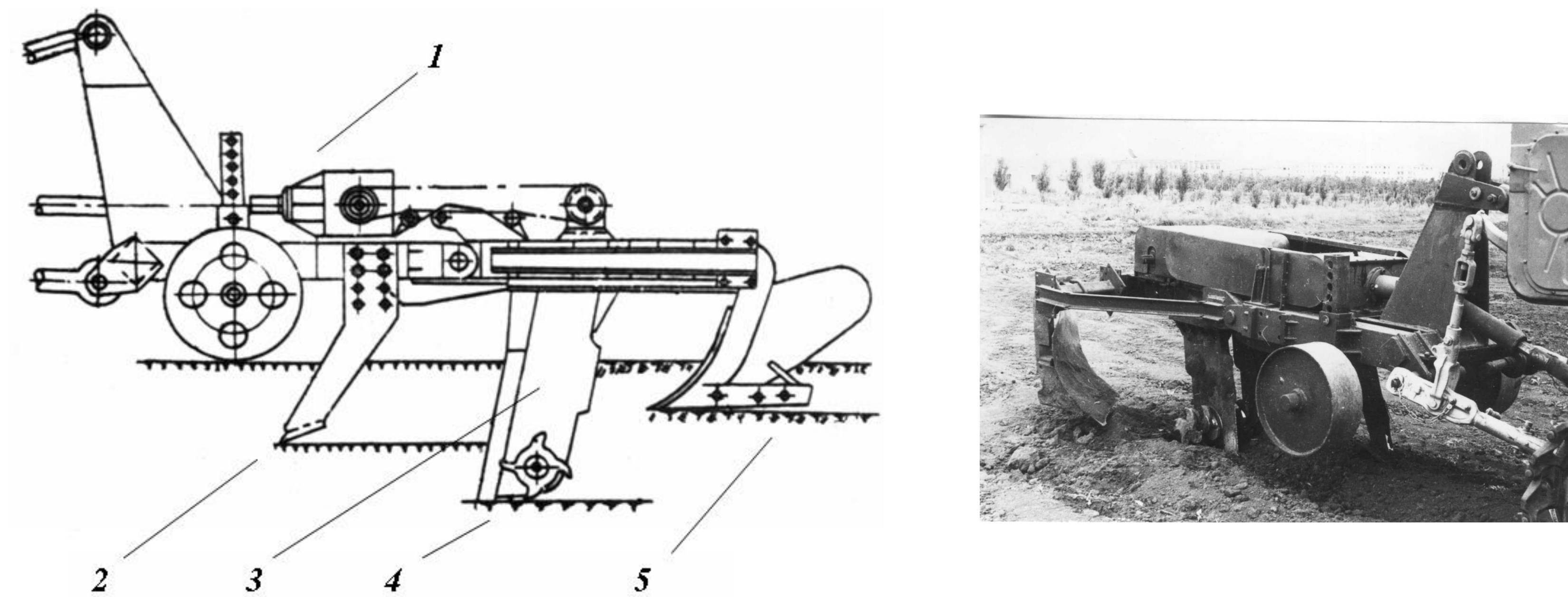
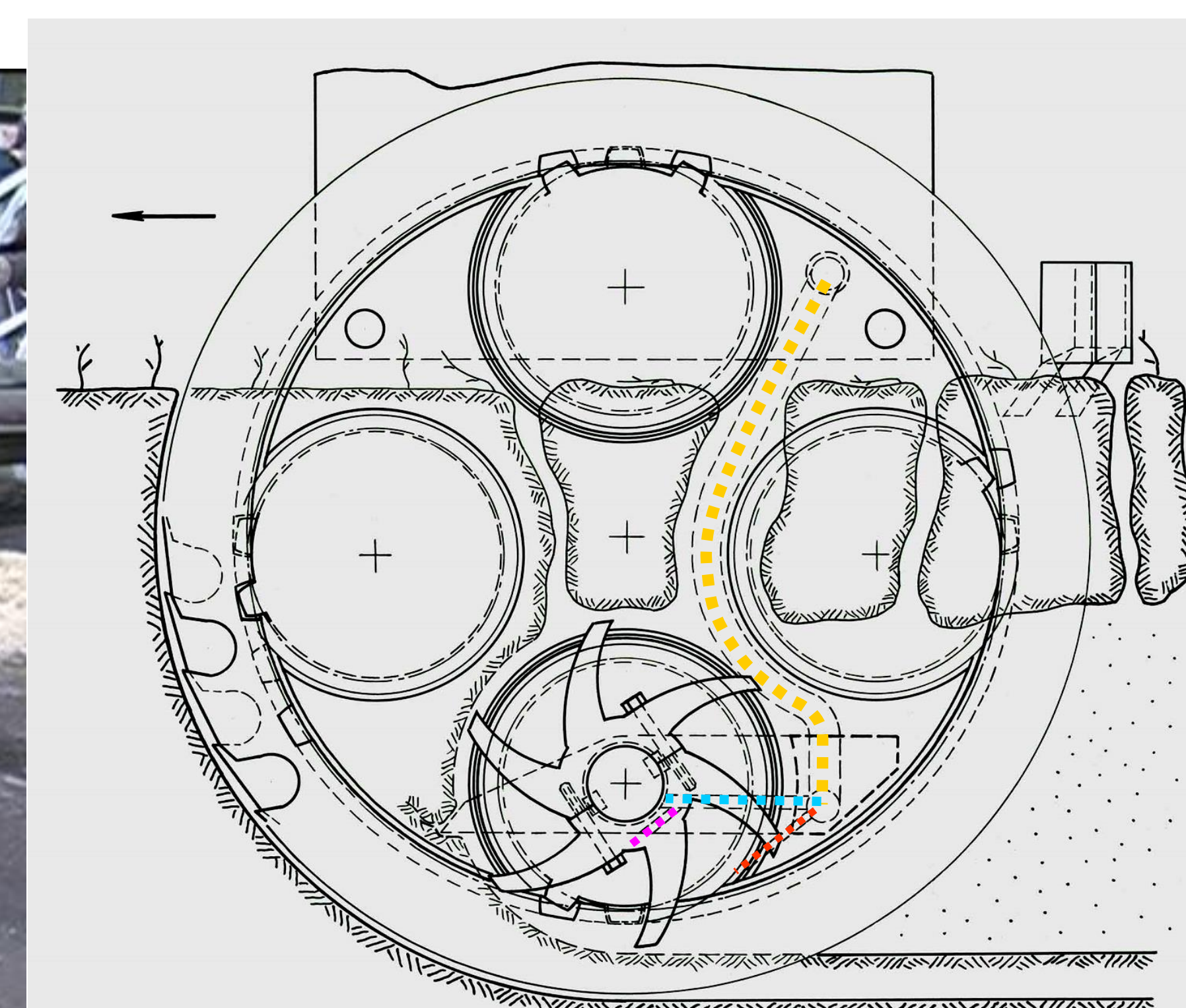


Fig. 1. Soil-milling device PMS-70. Mechanical drive (1), loosening knife (2), reducer rack (3), rotary milling ripper (4), topsoil passive plow (5).



Pulse intra-soil continually-discrete irrigation paradigm – injected into soil small discrete water dose distributes in vertical cylinder. Successive injections in 10-15 cm. After injection the water within 5-10 min spreads in cylinder of diameter 2-4 cm at depth from 5 to 50 cm. The soil carcass around the cylinder is rather dry and mechanically stable. Mean thermodynamic soil water potential after watering is of -0.2 MPa. Stomatal apparatus is in a regulation mode, transpiration rate is limited, soil solution concentration high, plant nutrition rate and biological productivity are optimal. No excessive transpiration, evaporation and seepage of water from soil.

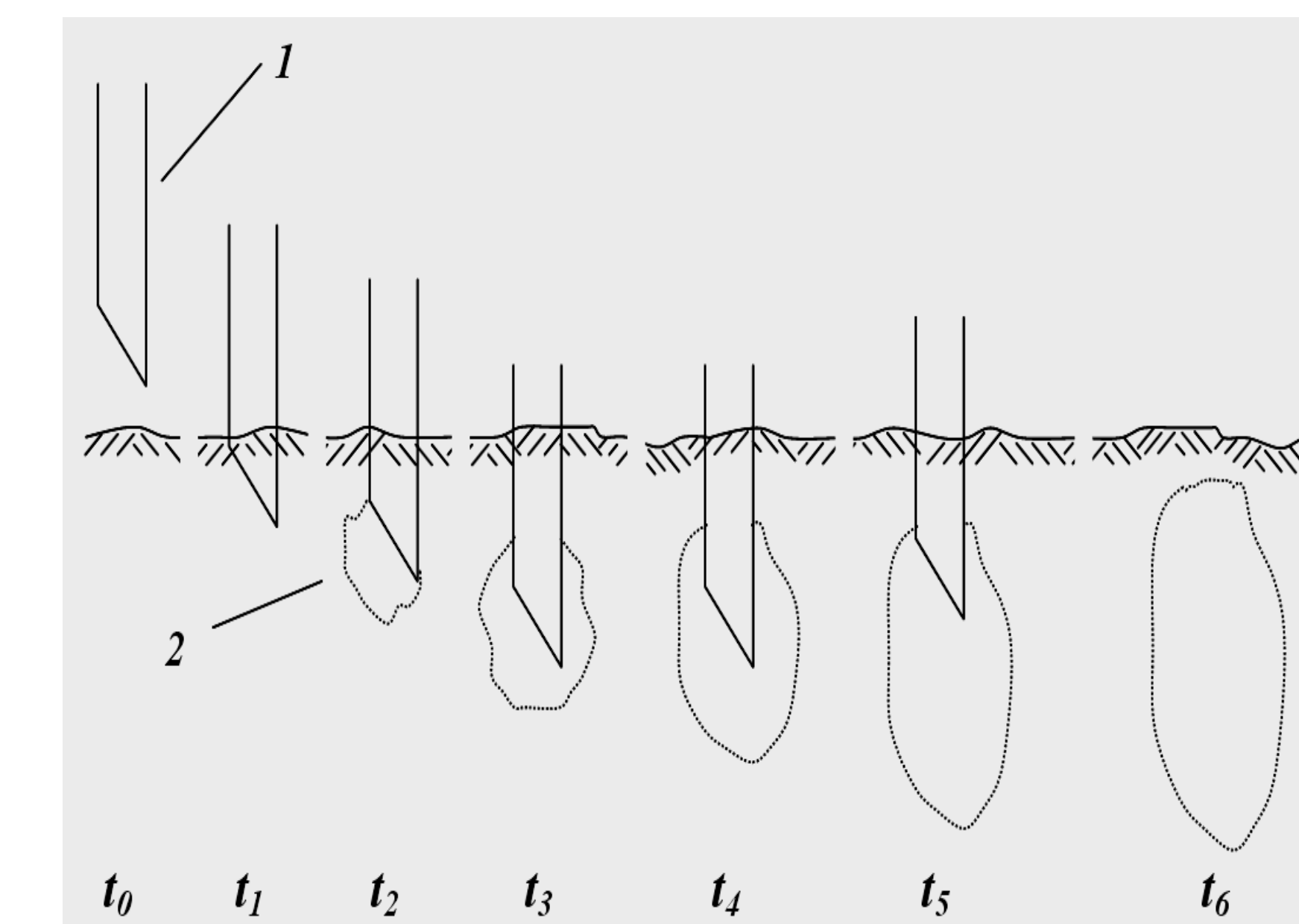
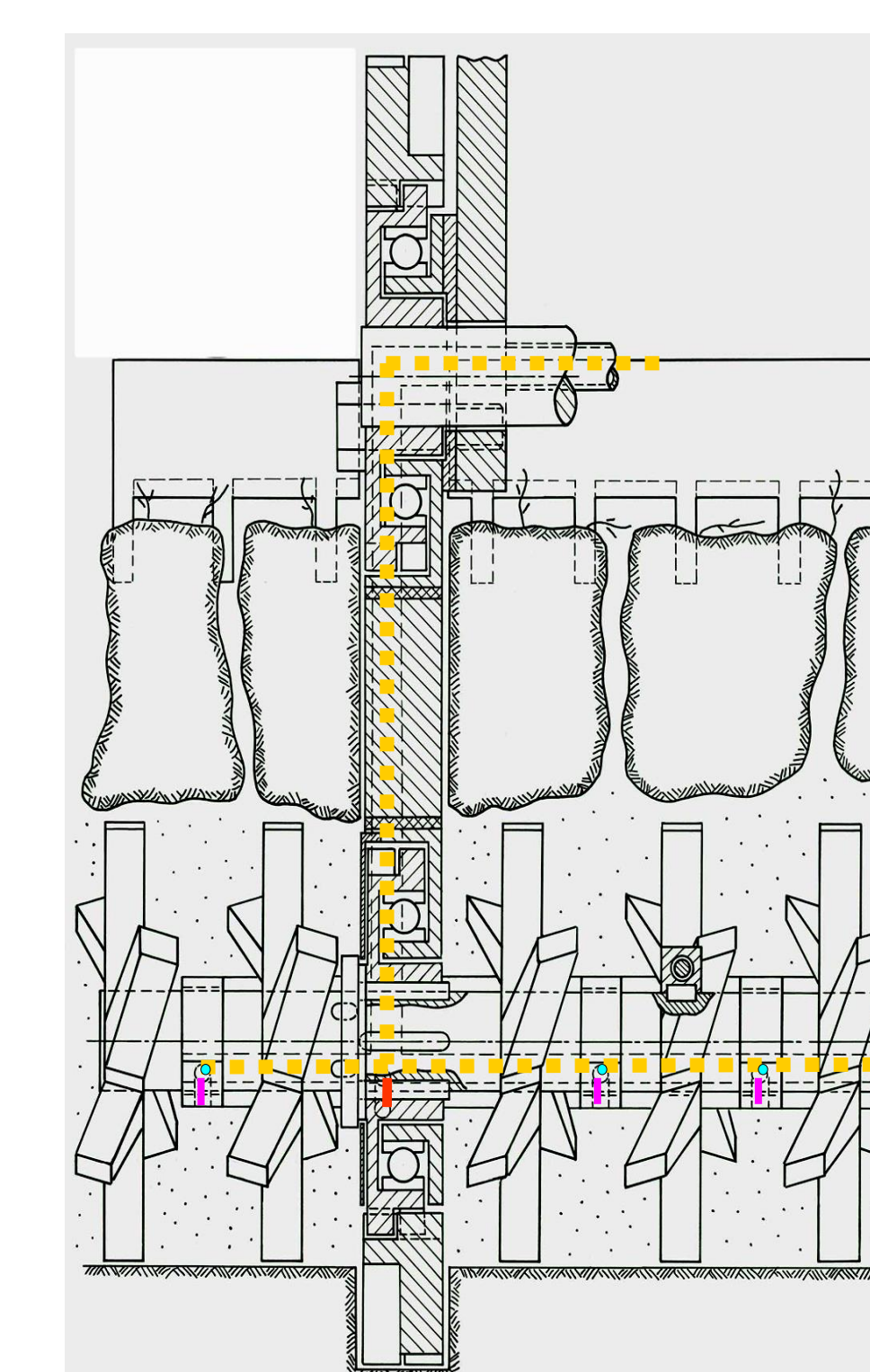


Fig. 2. Intra-soil pulse laterally-discrete watering. Wet soil contour dynamics. Patent RU 2386243. 1 – injection element for pulse water delivery into soil; 2 – soil humidifying contour; $T_0 - t_6$ – stages of water supply.

Fig. 3. Active reducer rotor device for soil milling and entering substances into soil. Patent RU 2387115.

Intra-soil environmentally safe waste return during intra-soil milling processing and (or) intra-soil pulse discrete plants watering with nutrition. Is provided the medically, veterinary and environmentally safe recycle of municipal, industrial, biological and agricultural wastes into the soil continuum. All applied substances transform to plant nutrients, not degrade to the greenhouse gas, or become the deposit of waste.



BGT* optimizes the natural and anthropogenic Earth's carbon cycle, reduces the greenhouse gases emission, implements conditions for green economy, provides an extension of the active area of the Earth's biosphere, water saving, soil and land health. The additional biological product – food, raw materials and biofuels – will be obtained. BGT* can be implemented on the basis of robotics providing cost savings compared to existing industrial technologies of agronomy and environment management.

BGT is an implementation of Geoethics in environmentally safe, productive and low cost technologies of Biosphere at the stage of Noosphere.*