

Method, System, and Apparatus of Radial Irrigation and Irrigation of Regular and Irregular Lands

The First Pressurized Irrigation System of Iran and the World's Newest System and Apparatus for Pressurized Irrigation (A Part of Certified Invention)

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ABSTRACT

Radial irrigation system and apparatus and irrigation regular and irregular lands, which is known as the first Pressurized irrigation system and apparatus in Iran, and the newest irrigation system and apparatus in the world, not only solves many difficulties of the present irrigation systems in the world, but also has a lot of advantages. This system has the capability of irrigating different lands with various shapes like triangle, square, rectangle, lozenge, parallelogram, regular hexagon, and irregular lands.

Introduction

Overview of Difficulties of Pressurized Irrigation Systems in World and Iran

1. Dependence of irrigating all the area on one irrigation system and Apparatus
2. Lack of coordinated and regular irrigation of the farm in one irrigating process.
3. Time-consuming method to irrigate the whole farm.
4. Obstruction in water transferring pipes, and irrigation pipes.
5. Severe and unfavorable effect of the wind on the function and output of the system, and on uniformity of water distribution on the land.
6. Lack of extension in functioning level of irrigating devices and systems.
7. Large-Scale dimensions and existence of aerial structures in irrigating devices and systems.
8. Lack of the adjustment height of irrigation.
9. Irrigating devices and systems being blown away by wind.
10. Rust in the wheels of the devices.
11. Poor efficiency of the devices in steep slopes and transverse slopes.
12. Bending of the pipes and their disposition while transferring.
13. Possibility of damage in small parts of irrigation system resulting in the damage of the entire system and loss of all the crops.
14. Lack of uniformity in water distribution due to negative slope in the farm because of a simultaneous positioning of one part of the system in positive slope and one part in negative slope.

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15. Need for a very precise management of the system.
16. An obvious loss in friction of the pipes in center pivot system.
17. Water loss on the farm and water waste in center *pivot system*, as a solution results in excessive daily pipe cycle and an increase of watering time.
18. Tension for old trees, for the first and second years after performance of *drip irrigation*
19. Failure to water the corners of square-shaped fields in *center pivot irrigation*.
20. Superficial planning of center pivot systems.
21. Sever damages to irrigation pipes by rodents.
22. Hard damages to plant growth due to low security in the water supply in roots zone of drip irrigation systems.
23. Imprecise installment of the pipes and inaccurate work to install pipes in wet lands.
24. Stealing the pipes because of their expensive price and presence of long and numerous watering pipes networks.
25. Failure to uniform irrigation of the entire root zone in drip irrigation systems.
26. Need for consideration of depletion valves in irrigation devices and systems.
27. Problems for irrigation systems due to wet soil.
28. The performance possibility of only one cultivation model and one special form to cultivate plants using the available watering systems in the world.
29. Positional salinity and unorganized distribution in the soil in drip irrigation system.
30. Obstruction of the pipes due caused by the salinity in the irrigation water.
31. Failure irrigation schedule due to the dysfunctions of the irrigation systems caused by unfavorable climatic conditions.

Materials and Methods

System and apparatus of Radial irrigation is the novel system and apparatus of pressurized irrigation and the most up-to-date irrigation system and device in the world and Iran. The mechanism is dependent on the changes of water supply being distributed according to the changes of the voltage in the system. Radial irrigation system and method has the capability of watering all shapes of regular fields, (square, triangle, rectangle, lozenge, parallelogram, regular hexagon)and irregular fields.

Here is irrigating of a square-shaped farm by Radial irrigation system;

In junction of the diameters of the square with the line the cuts the square in two equal sections, 8 devices in 8 different directions, which includes 4 directions on the diameters of the square with 4 directions on the line the cuts the square in two equal sections (all the eight directions are in the figure1), are installed and are put toward the corners of the square (Figure 1). Directly after the irrigation order, all the 8 devices simultaneously start working to 8 different directions (figure 1), and simultaneously all the eight machines irrigate; So each device would water one section of the square (figures of 2-A,2-B,2-C), with the movement of the devices outwards (middle of the sides and corners of the field),and the device function is on 4 directions and on the line that separates the square in two equal parts (figure 2-A), through first to end of path, in two sides of apparatus irrigation from zero to the desired level is equally and simultaneously would be increased. Also the functions of the machines on the diameters of the square, through first path to the junction and the tangent line on the inscribed imaginary circle in the square (figure 1), from zero to the desired irrigation level at the end of the radius of the circle in both sides of the device would be equally increased, and from the end of the considered length to the corners of the square, the irrigation will equally, but with a higher speed would be decreased in order to no irrigation in the corners.

Also total irrigation of regular lands (triangle, square, rectangle, lozenge, parallelogram, hexagon and) follows the so-called irrigation method.

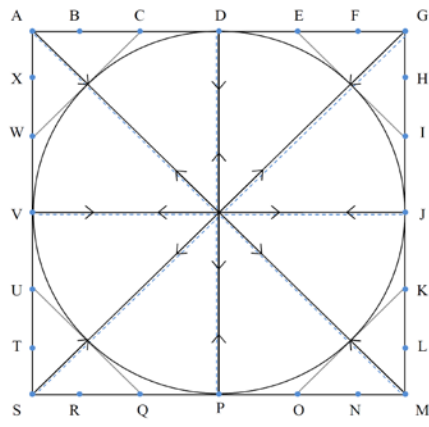


Figure 1: Instance method and system of Radial irrigation

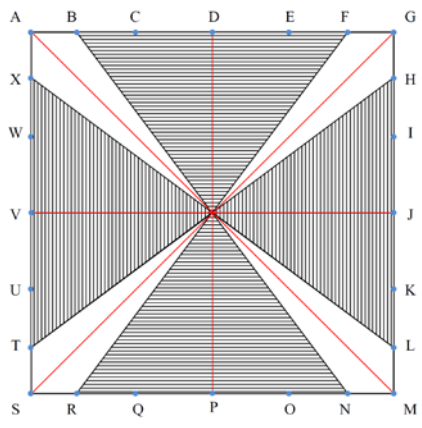


Figure2-A: Radial irrigation perpendicular of divide in halves systems

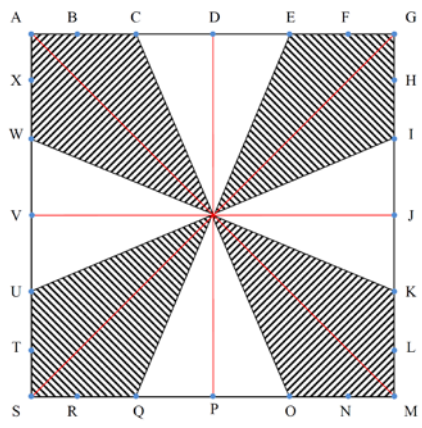


Figure2-B: Radial irrigation diameter systems

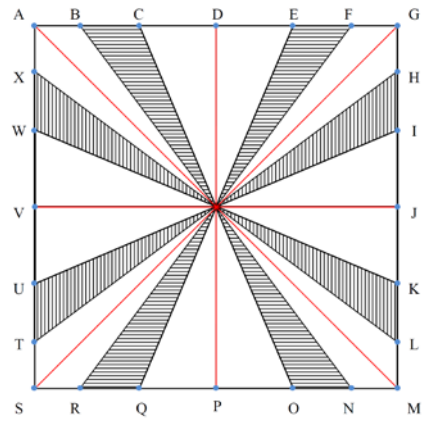


Figure2-C:common lands in two last figures

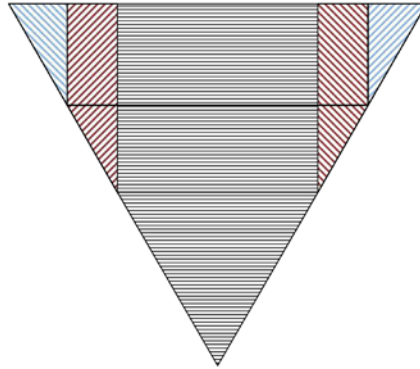


Figure2-D: basis of Radial irrigation work

In addition, using some special particulars of increasing and decreasing the amount of water being distributed in the system, the radial irrigation system can also be used to water irregular fields(Figures 3-A, 3-B).

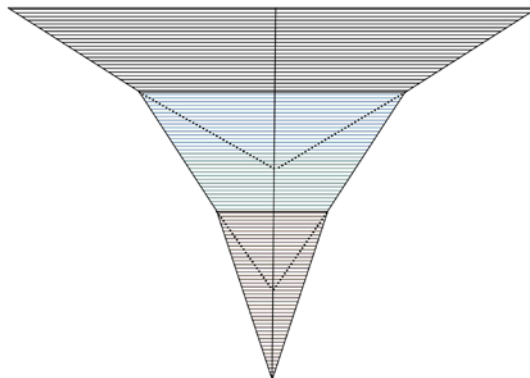


Figure3-A: basis or irrigation of irregular lands