

UNITED STATES PATENT OFFICE.

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METHOD OF AND AGENT FOR LAYING DUST.

No. 828,643.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CLINTON E. DOLBEAR, a citizen of the United States, residing at Longbeach, in the county of Los Angeles and State of California, have invented a new and useful Method of and Agent for Laying Dust, of which the following is a specification.

This invention relates to a method of laying dust and the agent employed therefor.

As is well known, there are many mineral salts that have the property of occluding moisture and holding it uncombined and in free condition to be yielded gradually under the action of heat by surface evaporation. To be thoroughly effective for the purpose designed, it is essential that the agent employed shall not only possess the properties defined, but that these properties shall have a definite limit; otherwise under certain conditions their utility will be nullified or completely destroyed. To this end it is necessary that the average deliquescence of the agent shall be in a state of hygrometric balance with the usual hygrometric conditions of the atmosphere—that is to say, that it shall neither give up sufficient moisture to become a dry or dusty powder nor absorb enough to become a thin liquid capable of seeping away through the pores of the soil. As an example of one of these salts magnesium chlorid may be mentioned. If a roadway be sprinkled with this salt, as long as it remains uncombined with the earth it will operate in an effective manner to absorb moisture and under favorable conditions and as required to dispense it in the form of a liquid film or stratum that will operate in a positive manner to keep the dust moist and prevent it from rising from any cause. In addition to the characteristics defined magnesium chlorid possesses deliquescent properties that will cause it to remain in hygroscopic balance with the aerial moisture and to deliquesce only to such an extent as to permit it at all times to retain sufficient moisture to agglomerate or agglutinate dust particles without deliquescing to such an extent to form a thin liquid that will flow away into the under soil. On a large scale, however, it will be impracticable to employ magnesium chlorid as a road-surfacing agent, as its cost would be too great.

The object of the present invention is in a ready, inexpensive, feasible, and practical

manner and by the employment of an agent that has heretofore been a waste product to render roadways hard, smooth, and dustless, and, further, by the peculiar properties of the agent employed to render frequent treatment unnecessary, thereby to eliminate the feature most objectionable in methods of this character now in vogue and to reduce the cost of the procedure to a minimum.

With the above and other objects in view, as will appear as the nature of the invention is better understood, the same consists in the novel method of laying dust and the agent employed therefor, as will be hereinafter fully described and claimed.

In carrying the invention into effect there is employed as a road-surfacing material a hygroscopic agent of limited deliquescence and one that has the property of repeatedly occluding moisture and of yielding it by surface evaporation. The material employed for this purpose is a waste product, being the residuum or mother-liquor that results from crystallizing the salt out of sea-water and which is commonly known as "bitter brine" or "bittern," a substance in which there is an enhanced proportion of magnesium chlorid that imparts to it its hygroscopic and deliquescent properties. This agent is applied to a roadway by an ordinary sprinkling-cart or other suitable apparatus and operates to retain the dust in a moist condition, but does not render it adhesive or sticky like mud, this being due to the fact that the agent always remains in hygrometric balance with the aerial moisture. The bittern when thoroughly incorporated with the dust forms a cementitious surface to the roadway that in time will become hard and smooth; but it does not, however, for an extended period lose its hygroscopic properties, but will so long as any moisture is in the atmosphere greedily absorb it and yield it under favorable conditions. Where the method is practiced in very dry climates, the moisture supplied to the surfacing agent is taken from the atmosphere during the night and by the action of the sun's heat is drawn to the surface and dispensed during the warm hours of the day, causing the roadway to maintain a freshly-sprinkled appearance. In other climates the moisture will be supplied to the agent from rains, as well as by absorbing the moisture from the atmosphere, as above pointed out.

In order to define exactly what is meant by the statement that the average deliquescence of the agent shall be in a state of hygrometric balance with the usual hygrometric condition of the atmosphere, thus to prevent complete deliquescence, the following may be stated: If the humidity of the atmosphere be 90° and free magnesium chlorid be exposed directly to the action thereof, it will only absorb sufficient moisture to cause it to become viscid or sticky, and even if the humidity of the atmosphere increases it will still remain in this condition or in perfect equilibrium with the moisture of the atmosphere.

The cost of the material employed—that is, bittern—in localities where salt is crystallized will be nothing, as it is a waste product that is usually run into the sea, the main cost being the apparatus employed in dispensing it. From experiments it has been demonstrated that where a roadway has this substance applied to it—say to the extent of about one pound to the square foot—it will remain dustless for several months, whence it will be seen that the procedure is thoroughly practical from a commercial standpoint.

I claim—

1. The herein-described method of rendering roadways dustless which consists in applying thereto a hygroscopic agent in hygrometric balance with atmospheric moisture.

2. The herein-described method of rendering roadways dustless, which consists in applying thereto an agent capable of deliquescing only to a pasty consistency under normal hygrometric conditions.

3. The herein-described method of rendering roadways dustless, which consists in applying thereto a liquid containing non-deliquescent and deliquescent salts with the latter in such proportions as to exercise a dominant influence.

4. The herein-described method of rendering roadways dustless, which consists in applying thereto a liquid containing non-deliquescent and deliquescent salts with the latter in such proportions as to cause a hygrometric balance with aerial moisture.

5. The herein-described method of rendering roadways dustless, which consists in applying thereto a solution obtained from natural brines and containing an enhanced proportion of magnesium chlorid.

6. The herein-described method of rendering roadways dustless, which consists in applying thereto a liquid containing a substantial amount of magnesium chlorid.

7. The herein-described method of rendering roadways dustless, which consists in applying thereto sea-water from which a part of the non-deliquescent salts has been removed.

8. The herein-described method of rendering roadways dustless, which consists in applying thereto a liquid derived from natural brine and containing an enhanced proportion of deliquescent salts.

9. The herein-described method of rendering roadways dustless, which consists in applying thereto a desalted natural brine.

10. The herein-described method of rendering roadways dustless which consists in applying thereto a hygroscopic agent of limited deliquescence.

11. The herein-described method of rendering roadways dustless which consists in applying thereto a hygroscopic agent of limited deliquescence in liquid form.

12. The herein-described method of rendering roadways dustless, which consists in sprinkling the same with a liquid-containing magnesium chlorid.

13. The herein-described method of rendering roadways dustless, which consists in sprinkling the same with bittern.

14. A road-surfacing material having the property of repeatedly occluding moisture and yielding it by surface evaporation.

15. A road-surfacing material in liquid form containing an excess of magnesium chlorid.

16. A road-surfacing material consisting of bittern.

17. A road-surfacing material consisting of an agent of limited deliquescence having the property of repeatedly occluding moisture and yielding it by surface evaporation.

18. A road-surfacing material consisting of a hygroscopic salt of limited deliquescence.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

CLINTON E. DOLBEAR.

Witnesses:

J. H. JOCHUM, Jr.,

A. G. SEIPP.