(12) **United States Patent**
Johnson

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(54) **GRIST MILL, &GRINDING PAINTS, SNUFF, &C.**

(76) Inventor: **William S. Johnson**

William S. Johnson . New York City

Letters Patent

The Schedule referred to in these Letters Patent and making part of the same containing a description in the words of the said William S. Johnson himself of his improvement in mills for grinding Grain. Snuff Paints Dye Stuffs &c called the eccentric Mill or grinder

To all to whom these Presents shall come.

Be it known that I William S. Johnson of the City of New York in the County and State of New York have invented a new and useful improvement in Mills for grinding Grain. Snuff, Paints Dye Stuffs &c called the eccentric Mill or grinder and that the following is a full and exact description of the construction and operation of the said Mill as improved by me. The bed stone or runner (or whatever denomination) by which motion is communicated to what is usually called the runner in ordinary Mills is made in the usual way of the same materials of those in common use. being either of Stone or metal and of such diameter as shall best suit the work to be performed and the power to be employed. The bed stone consists simply of a number of inward curving furrows or grooves which I prefer for grinding Grain &c. but for grinding Dye stuffs &c of a spiral groove or furrow commencing at the center and running to the circumference of the stone. the eccentricity of which spirals must be small so that the surface may be well covered in either case. a number of straight short furrows are cut radiating obliquely back from the center of the stone which furrows must be of a length not to pass out from under the runner hereafter mentioned and become shallower as they proceed from the center their object being solely to facilitate the feeding of the grain &c. to the grinding surfaces. The runner is made permanently

fast upon the projecting end of a horizontal shaft which has a double bearing and turns in appropriate Boxes so that the motion of the driver may be steady and true the shaft receiving its motion from the moving power by a strap or cog gearing as may be preferred. It is also necked or turned smaller at its bearings so as to admit of a lateral movement by which the distance of the driver from the runner can be regulated and the Mill be made to grind Coarse or fine. This movement may be effected by a Lumper Screw Spring, weighted Lever, or by any of the means used for similar purposes. The top stone or runner is made of the same materials as the driver. The dress being similar except that it is recessed it has a circular opening or eye at the centre which I have found in practice should be about 2 inches in diameter for grain &c or about 4 for dye stuffs &c when the diameter of the driver is 2½ feet. but this must of course be varied to suit circumstances. From the back of the runner which is hollowed out so as to bring the attachment as near to the face of the stone as may be for strength. A short hollow shaft rises. the bore of which forms a continuation of the eye of the stone and which when metal is used may be cast solid with the runner. through which bore the substance to be ground is fed to the grinding surfaces. being enlarged at the outer extremity so as to admit the grain &c more freely to receive the foot of the feed hopper hereafter mentioned. A neck or wrist is also turned on the shaft (or which may also be formed by a screwing) at the end extending from the back of the runner near the end of which it ends with a square shoulder beyond the bearing of the shaft which fallows on a cylindrical box of suitable materials that protrudes into the cavity of the back of the runner so that the neck or wrist of the shaft being slightly diminished towards its outer extremity) the bearing is chiefly upon the inner portion of the box close to the face of the runner as possible. This arrangement is intended to admit of a slight vibration to the runner when grinding that it may accommodate

itself to the irregularities that may take place in the feeding between the grinding surfaces. However the bearing of the runner is raised above that of the driver so as to bring the lower edge of the eye on a level or a short distance above the centre of the driver making thereby the eccentricity equal to the diameter of the eye and the difference of the diameters of the Stones being made equal to the eccentricity the upper part of their circumferences when together coincide.

The feed hopper which is of a trumpet shape and receives the grain &c from the shoe of an ordinary hopper into which it is first thrown is supported in an oblique position so as to afford an easy descent to the grain &c by a short bracket or arm which rises from the upright bearing of the runner shaft to which it is attached its foot is diminished so as to enter the enlarged end of said shaft and fit it neatly without friction. it is prolonged by a small square bar or finger which is attached to the inner surface of the lower end of said foot and winds spirally along the cavity of the shaft until it nearly reaches the face of the runner. The office of this finger being to assist the feeding and to prevent choking from adhesion to the sides - particularly when grinding paint. The stones are surrounded with with a curb of ordinary construction with a proper discharging outlet two tubes being introduced opposite the extremities of the horizontal diameter of the driver for the purpose of keeping up a constant circulation of fresh air which by the peculiar operation of the grinding surfaces is drawn in at one side and discharged at the other.

Operation. — The substance to be ground being placed in the hopper and the Mill set in revolution by the combined motions of the spiral finger and the driver and runner it is fed to the grinding surfaces which reduce it rapidly to the degree of fineness for which the mill is set. Although I have only described the mill as operating with the grinding surfaces in a vertical position. I also intend to operate it horizontally by making a suitable alteration in the lower bearing or step of the driving shaft and

dispensing with the feed hopper only returning the spiral finger & thus shiten for grinding, Some substances will be found to answer best. Now I do not claim the principle of placing the driver and runner eccentric to each other. but what I do claim as new & as my invention for which I ask Letters patent is the hollow shafts of the runner attached and supported as herein described and the spiral finger and feed hopper by the joint operation of all which together with the grinding surfaces of the runner and driver. the runner is properly sustained and the feeding effected. I also claim the dress of the stones as set forth and the plan of making the bed stone to regulate the mill instead of the upper stone or runner — In testimony that the foregoing is a true specification of my said improvement I have hereunto set my Hand this 16th day of June 1838

Witnesses
Sam Stettinius
Wm J Steiger

Wm L Johnson

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