

F. STACEY.
GRINDING ROLLS FOR TREATING WHEAT AND OTHER GRANULAR SUBSTANCES.
APPLICATION FILED JAN. 26, 1911.

1,055,096.

Patented Mar. 4, 1913.

Fig. 1.

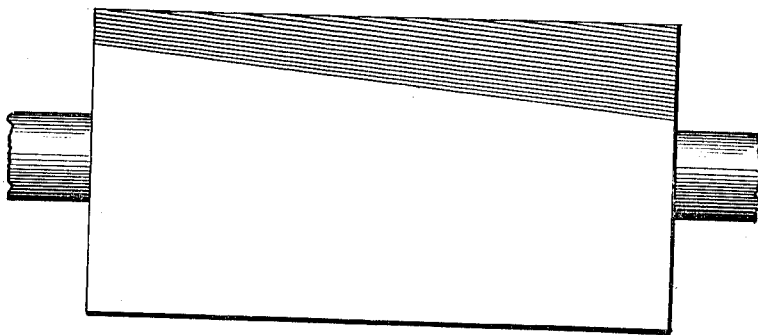


Fig. 2.

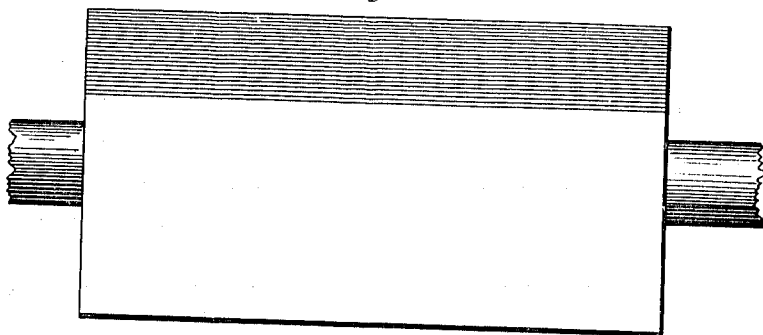
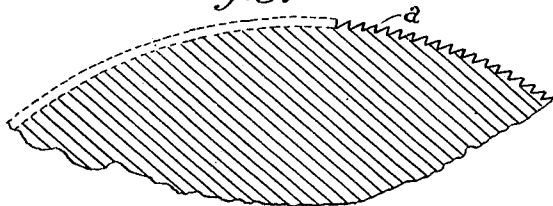


Fig. 3.



Witnesses
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FRANK STACEY, OF BIRMINGHAM, ENGLAND.

GRINDING-ROLLS FOR TREATING WHEAT AND OTHER GRANULAR SUBSTANCES.

1,055,096.

Specification of Letters Patent.

Patented Mar. 4, 1913.

Application filed January 26, 1911. Serial No. 604,883.

To all whom it may concern:

Be it known that I, FRANK STACEY, a subject of the King of Great Britain, residing at Vauxhall street, in the city of Birmingham, county of Warwick, England, have invented certain new and useful Improvements in Grinding-Rolls for Treating Wheat and other Granular Substances, of which the following is a specification.

10 In milling wheat it is generally the practice when dealing with pure break meal comprising the grades known as "semolina", "middlings", and "dunst" to grind or reduce the same by plain or smooth surfaced chilled iron rolls and owing to the flaking tendency of such rolls auxiliary machines called "detachers" are largely used to break up the flaked stock and such rubbing action is apt to discolor or lower the color of the flour to some extent. It is to the grinding or reducing of such pure or nearly pure stock that my invention relates and the invention consists in the use of chilled rolls whose grinding surfaces are very finely corrugated, cut, or grooved in the substantial proportions of at least eighty cuts or grooves to the circumferential inch, and in some cases as many as one hundred cuts or grooves or even more to said inch. The said grooves or cuts which form saw toothed or other shaped cross sectional rises, are either straight ones longitudinally of the roll surface or right or left hand long pitched helical ones, or of wave formation directed either axially or obliquely, and are formed throughout the full extent of the grinding surface.

The smooth-surfaced rolls employed for the reduction of the break meal exert a crushing action upon the crystal-like particles and deform many of the crystals or groups of crystals into flat disks or flakes which are incorporated in the ultimate product and lower the quality thereof. Some of these flakes are too large to pass through the silk of the separating or dressing machines and ultimately go off with the tailings or offal. In this way there is quite an appreciable loss in the yield. The rolls exert considerable pressure upon the stock and the resultant friction not only increases the load on the motor but causes the rolls to become somewhat highly heated. Owing to this heat, the rolls take up moisture from the stock and thus cause a further loss in the yield. This liberation of moisture is also

disadvantageous in that condensation takes place upon the walls of the casing in which the rolls are mounted and some of the condensed moisture, mixing with the stock as it passes to the separating or dressing machine, causes pasty or lumpy formations which choke or clog the silk of such machine and thus lower the effectiveness of its action.

The reducing rolls which form the subject of the present invention effect the reduction of the break meal into flour, not by a crushing action, as is the case with the smooth-surfaced rolls, but by a cutting action purely, in which the crystals are progressively divided into smaller crystals of like character, but in which there is no deformation of the crystals into flakes. The efficiency of the action depends upon the sharpness of the corrugations, and the rolls are definitely spaced to prevent contact of the sharp cutting edges when there is no feed on the mill. It follows that the friction which is incident to the action of the smooth-surfaced rolls is eliminated and, as a consequence, the rolls "run cool", and the load on the motor is reduced. While the fine corrugations of the rolls effectively cut the crystals of the break meal, they do not cut the germ or any branny matter which may still remain in the meal, but merely "crinkle" these extraneous particles and thereby provide for their ready separation with the tailings by the dressing machines.

The flour obtained from the corrugated reducing rolls which form the subject of the present invention is of a lively or bright character, and is of the highest quality. There is also a substantial increase in the yield over the yield which is obtained by the smooth-surfaced rolls. Inasmuch as the flaking tendency of the smooth-surfaced rolls is avoided, there is no occasion for the use of "detachers".

The drawings forming part hereof diagrammatically illustrate roll surfaces according to the invention, it being however clearly understood that the invention is not, *per se*, a chilled roll whose surface is corrugated, cut or grooved, but only such having grooves or cuts approximating from 80 to 100 or more per circumferential inch for use for the purpose of grinding or reducing pure or substantially pure break meal stock.

Figure 1 is a longitudinal elevation of a chilled roll whose grinding surface is long-

pitched helically cut or grooved, a number only of the grooves and consequent teeth being diagrammatically illustrated. Fig. 2 is a similar elevation where the cuts or grooves and consequent teeth are straight ones parallel with the axis of the roll. Fig. 3 is an enlarged cross section of a portion of a roll showing at *a* the grooves and consequent ridges or teeth which are substantially of saw toothed section, this formation being common to all the forms represented.

In all the formations of grooves and consequent ridges or teeth the proportion is from about 80 to 100 or more cuts or grooves per circumferential inch, that is to say per circumferential inch looked at from the end of the roll. It will be clearly understood that the proportions of cuts to the inch given are somewhat dependable upon the character of the stock treated. There is in the case of the lesser number a proportion below which the rolled surface would cease to have the advantageous effects on the stock desired and set out, and at the same time in the case of the larger number to the inch a proportion when the formation of the cuts

and the consequent teeth would be impracticable, but the proportions given are those which are capable of being carried out and of having the advantageous effects on the stock stated.

Having now described my invention what I claim and desire to secure by Letters Patent is:—

A chilled roll for reducing pure or substantially pure break meal stock having its periphery longitudinally corrugated throughout its extent, the corrugations being formed to provide relatively sharp cutting edges formed to crinkle the germ of the grain and to act with a purely cutting action on the main stock to form crystal-like particles, and ranging from approximately eighty to the inch to about one hundred to the inch.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

FRANK STACEY.

Witnesses:

GEO. FUERY,
DORA LEAKER.