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H. CAMMACK & W. J. SCHOONOVER.

GEARING FOR WASHING MACHINES.

APPLICATION FILED MAR. 14, 1904.

NO MODEL.

Fig. 2.

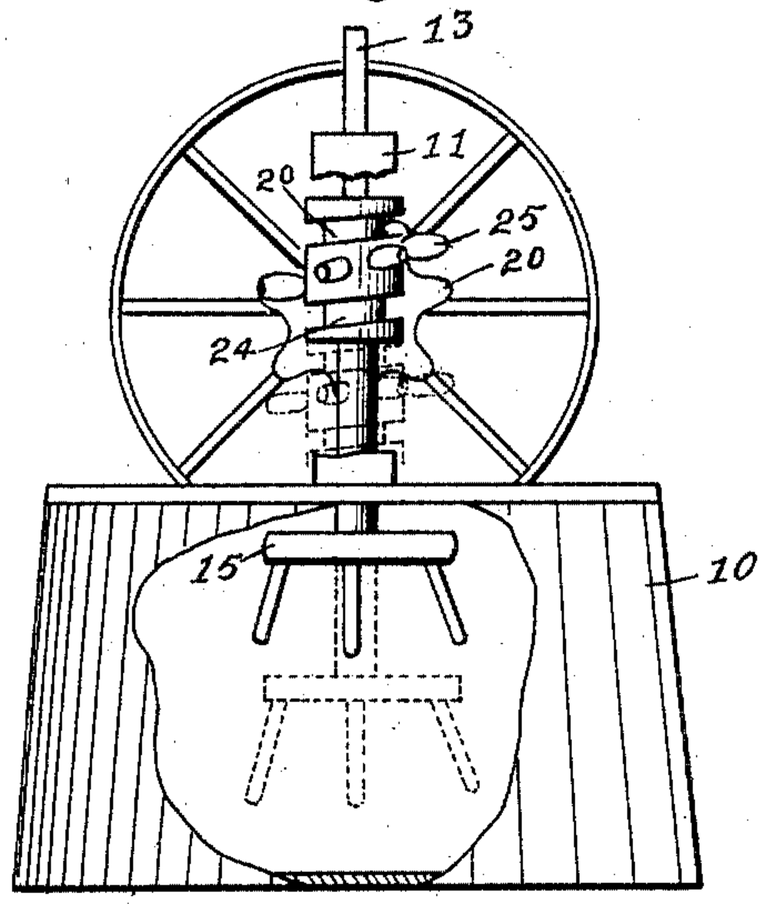


Fig. 3.

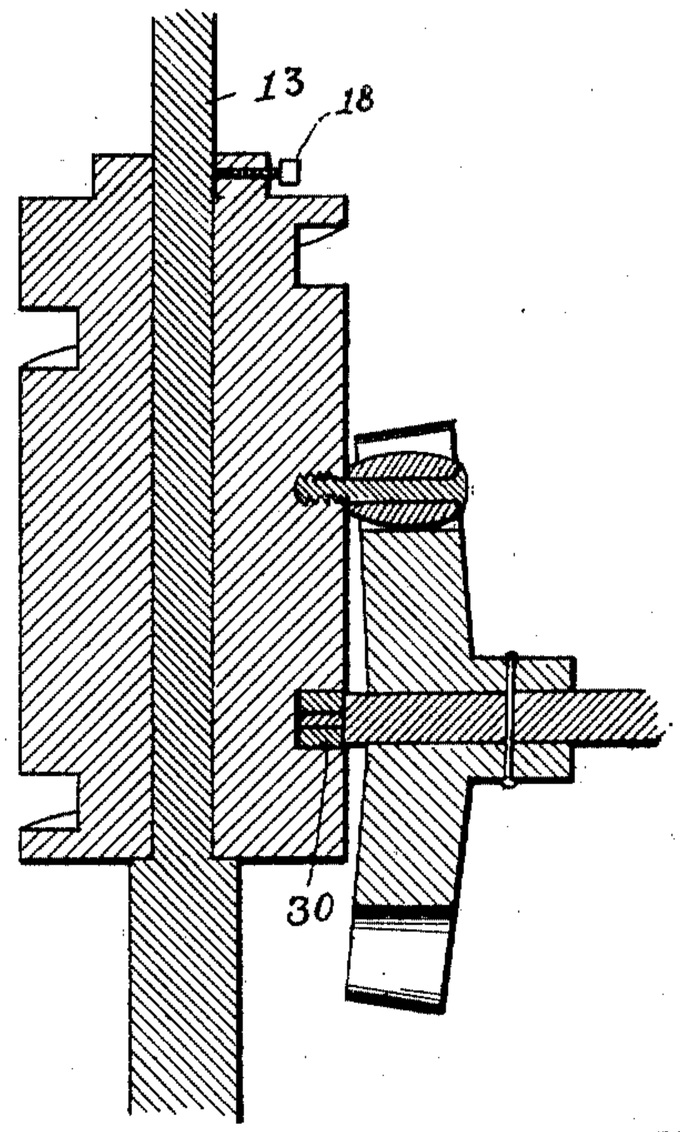


Fig. 4.

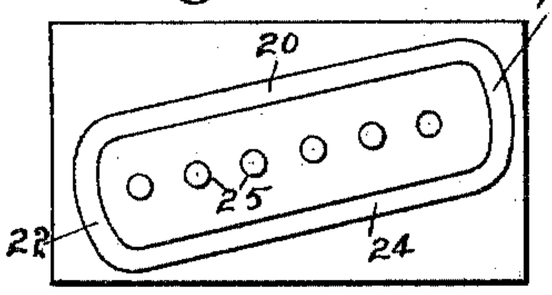
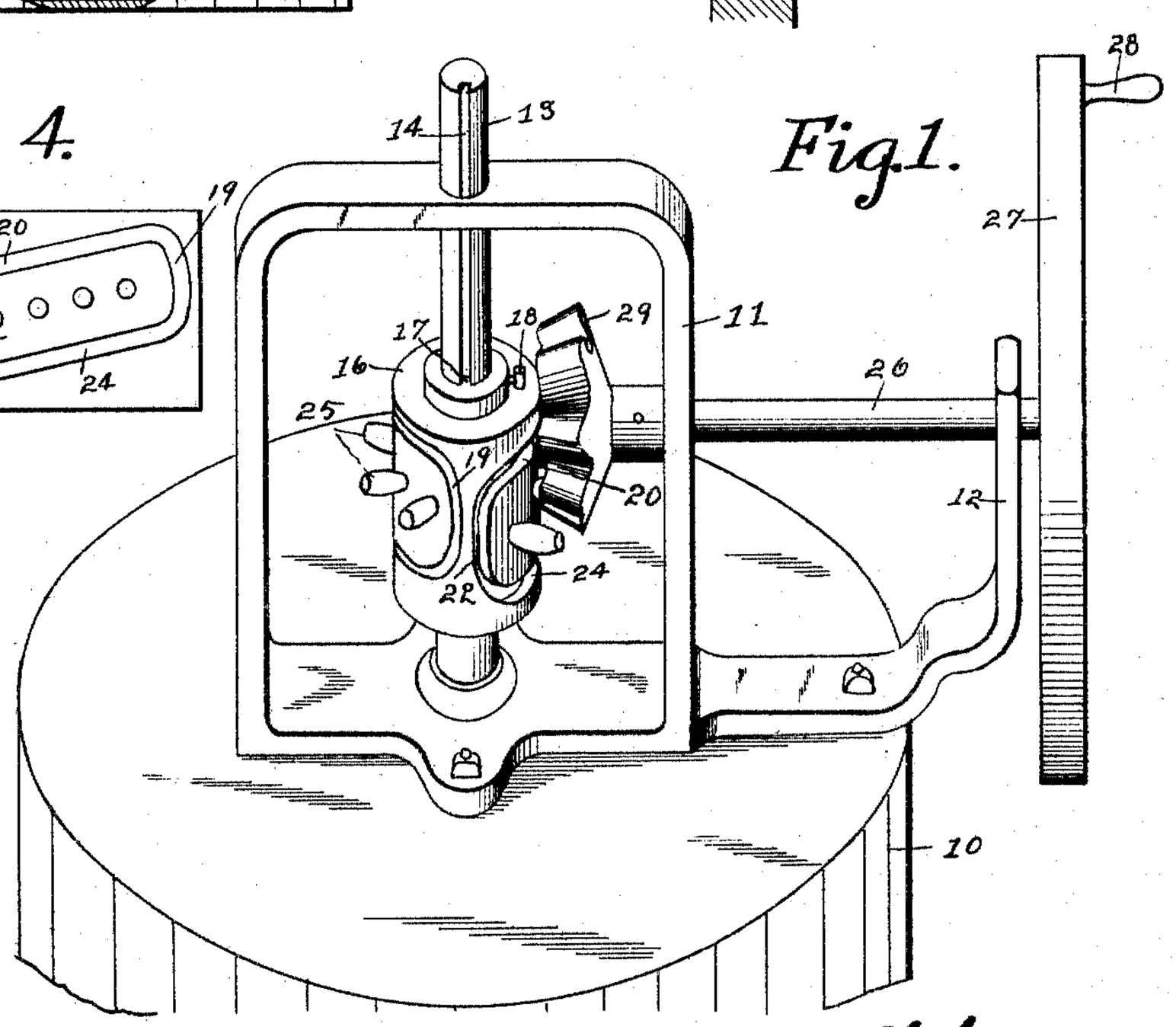


Fig. 1.



Witnesses

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No. 776,109. Patented November 29, 1904.

UNITED STATES PATENT OFFICE.

HORACE CAMMACK AND WILLIAM J. SCHOONOVER, OF DES MOINES, IOWA.

GEARING FOR WASHING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 776,109, dated November 29, 1904.

Application filed March 14, 1904. Serial No. 198,124. (No model.)

To all whom it may concern:

Be it known that we, HORACE CAMMACK and WILLIAM J. SCHOONOVER, citizens of the United States, residing at Des Moines, in the county of Polk and State of Iowa, have invented certain new and useful Improvements in Gearing for Washing-Machines, of which the following is a specification.

The objects of our invention are to provide means of simple, durable, and inexpensive construction and of light weight by which the clothes-agitator may be intermittently rotated backwardly and forwardly and also positively moved up and down at the same time.

Our object is further in this connection to provide an agitator-driving mechanism in which the pinion and cam-cylinder are of comparatively small size, and yet a comparatively long up-and-down stroke will be given to the agitator.

A further object is to provide a device of this class in which the cam-cylinder is slidingly and non-rotatably connected with the agitator-shaft, so that the agitator-shaft will be positively rotated by the pinion and yet be free to move up and down without being driven up and down, and also to provide means by which the cam-cylinder may be readily and quickly fixed to the agitator-shaft, so that the agitator-shaft will be positively driven up and down.

Our invention consists in certain details in the construction, arrangement, and combination of the various parts of the washing-machine, as hereinafter more fully set forth, pointed out in our claims, and illustrated in the accompanying drawings, in which—

Figure 1 shows in perspective a washing-machine body, the agitator-shaft, and the driving mechanism. Fig. 2 shows a side elevation of our improved washing-machine, a part of the machine-body broken away to show the agitator, the dotted lines in said figure showing the agitator and connected parts at their lower limit of movement. Fig. 3 shows a vertical central sectional view of the cam-cylinder and the driving-pinion, and Fig. 4 illustrates diagrammatically the arrangement of the groove and rollers on the cam-cylinder.

Referring to the accompanying drawings, we have used the reference-numeral 10 to indicate the washing-machine body. Mounted upon the body portion is an arched bracket 11, having an integral upwardly-projecting arm 12. Mounted in the bracket 11 is an upright shaft 13, having a longitudinal groove 14. This shaft is slidingly mounted to move vertically in said bracket. Its lower end projects through the top of the machine-body, and an agitator 15 is fixed to its lower end. Mounted upon the shaft 13 is a cylinder 16, having a spline 17 entering the groove 14, thus permitting the cylinder to freely slide longitudinally of the shaft and preventing its rotation relative to the shaft.

18 indicates a set-screw in cylinder 16, by which the cylinder may be fixed against longitudinal movement on the shaft. Formed on the exterior of the cylinder 16 is a cam-groove having a comparatively long vertical portion 19. At the top of the part 19 is a part 20, which extends around the cylinder and downwardly to a point adjacent to the part 19. Then the groove extends downwardly at 22 parallel with the part 19. This vertical portion of the groove is considerably lower than the part 19. At the bottom of the part 22 the groove extends around the cylinder and upwardly at 24 and connects with the lower end of the part 19. Attached to the cylinder between the upper and lower parts of the groove is a series of rollers 25, placed at regular distances from each other. The rollers at the end of this series are close to the vertical portions of the groove. This series of rollers extends spirally around the cylinder, so that the adjacent end rollers are arranged out of horizontal alinement, the roller next the part 19 of the groove being higher than the roller nearest the part 22.

The reference-numeral 26 indicates a shaft

having its end portions mounted in the bracket 11 and the arm 12. On one end of the shaft 26 we have fixed a balance-wheel 27, having a handle 28, and on the other end of the shaft we have fixed a pinion 29, having rounded teeth to coact with the rollers 25. The end of the shaft 26 projects beyond the pinion 29 and is provided with a small roller 30, projecting into the cam-groove of the cylinder 16.

In practical use and assuming the parts to be in the position shown in Fig. 1, and assuming, further, that the shaft 26 is rotated in the direction required for moving the lower end roller 25 to the right, then the cylinder 16 will be rotated until the roller 30 enters the top of the part 22. Then further rotation will be stopped by said roller, and the roller 25 at the lower end of the series will be held in mesh with the pinion 29. A further rotation of the pinion in the same direction will elevate the cylinder 16 until the roller 30 passes out of the lower end of the part 22, and when this position of the cylinder 16 is reached the lower end roller 25 will be on top of the pinion 29. Then as the pinion is rotated further in the same direction the cylinder 16 will be rotated almost a complete revolution by the rollers 25 engaging the teeth of the pinion, and during this rotary movement of the cylinder 16 the cylinder will be lowered slightly—that is to say, it will move downwardly through the same distance as the difference between the elevation of the rollers at the ends of the series. Then the roller 30 will be in the top of the part 19 of the groove, and as the pinion is rotated further the cylinder 16 will be compelled to move downwardly by the roller 30, and the upper one of the series of rollers 25 will remain in mesh with the pinion 29 until the cylinder 16 is at its lower end of its movement, and a further rotation of the pinion will bring the cylinder around to the position shown in Fig. 1. The shaft 13 will be turned in either direction by reversing the movement of the balance-wheel.

By arranging the series of rollers spirally and forming the cam-groove in the manner described we obtain several very desirable results. First, we can use a comparatively small pinion and yet obtain an up-and-down movement of the cylinder 16, said movement being of a length as great as the diameter of the pinion combined with the difference in elevation between the rollers 25 at the ends of the series, and by having this spiral arrangement of rollers 25 the cylinder 16 may be made quite small and yet a long stroke given to the shaft 13. In some instances it is desirable to permit the agitator to move up and down freely without being positively forced in either direction, and in our machine this may be done by simply loosening the set-screw 18, whereupon the cylinder 16 will move up and down in the manner before described and yet the shaft is free to move without being affected by the up-and-down movements of the cylinder.

Having thus described our invention, what we claim, and desire to secure by Letters Patent of the United States therefor, is—

1. In a machine of the class described, the combination of a cylinder slidingly and rotatably mounted and provided with a cam-groove, a series of projections on the cylinder extended spirally around the cylinder, a pinion rotatably mounted to coact with the projections on the cylinder and a projection at the center of the pinion entering said cam-groove, said cam-groove shaped to coact with the projection at the center of the pinion to hold the projections of the cylinder in mesh with the pinion and to direct the cylinder to move up and down when the end projections of the series on the cylinder engage the pinion.

2. In a machine of the class described, the combination of a machine-body, a shaft slidingly and rotatably mounted, a cylinder on the shaft provided with a cam-groove, a series of rollers fixed to the cylinder and extending spirally around the cylinder, a pinion rotatably mounted to engage the said rollers and a roller at the center of the pinion projecting into the cam-groove, said cam-groove arranged to coact with the roller at the center of the pinion to hold the pinion in mesh with the rollers of the cylinder at all times and to direct the cylinder up and down when the pinion is in engagement with the rollers at the ends of the series.

3. In a machine of the class described, a shaft slidingly and rotatably supported, a cylinder slidingly and non-rotatably mounted on the shaft means for fixing the cylinder in position on the shaft, a series of rollers projecting outwardly from the cylinder and arranged spirally, a pinion rotatably mounted and in mesh with the said rollers and a roller at the center of the pinion, said cylinder provided with a cam-groove receiving the roller of the pinion and coacting therewith to hold the pinion in mesh with the rollers at all times and to move the cylinder in a direction parallel with the shaft when the pinion is in an engagement with the end rollers of the series.

4. In a machine of the class described, a machine-body, a shaft slidingly and rotatably mounted with one end in the machine-body, a cylinder sliding and non-rotatably mounted on the shaft, a set-screw in the cylinder to engage the shaft, a series of rollers projecting outwardly from the cylinder and arranged spirally, the end rollers of the series arranged at materially different distances from the machine-body, a shaft rotatably mounted at

right angles to the first shaft means for rotating said shaft, a roller on the said shaft adjacent to the cylinder and a pinion on the latter shaft said cylinder provided with a cam-groove, shaped to coact with the roller on the latter shaft in holding the rollers of the series constantly in engagement with the pinion and in causing the cylinder to move in a direction parallel with the shaft when the end rollers of the series are in engagement with the pinion.

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Witnesses:
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