L. Z. PRESTON.

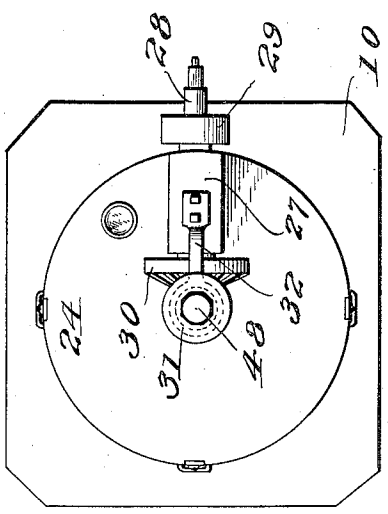
CHURN.

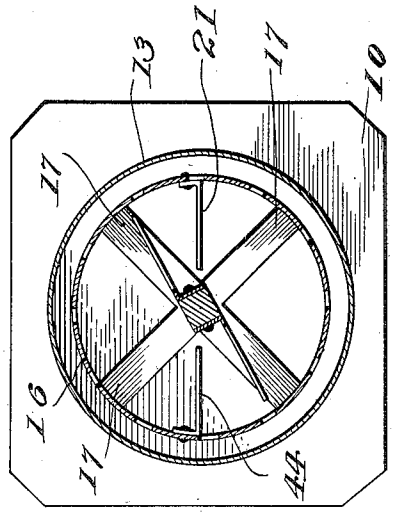
APPLICATION FILED JAN. 22, 1913.

1,070,728.

Patented Aug. 19, 1913.

2 SHEETS—SHEET 1.





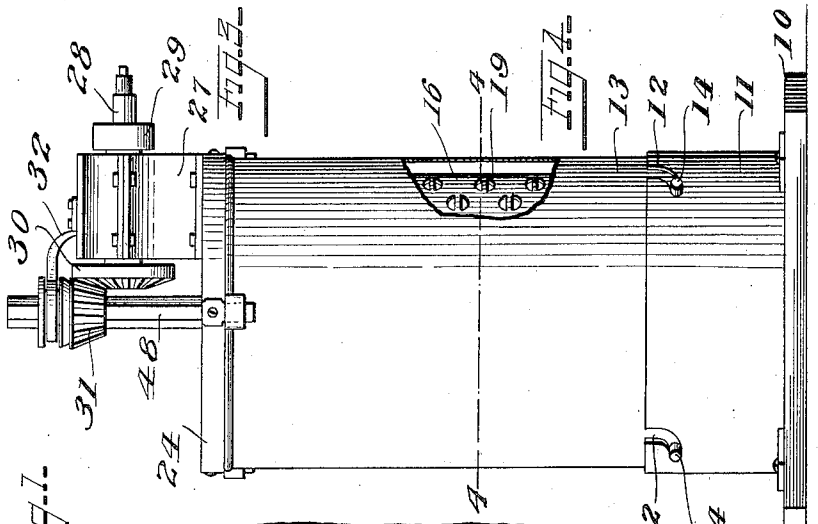


Fig. 1.

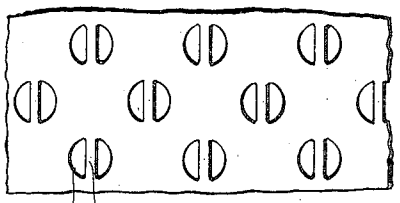


Fig. 5.

Witnesses

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CHURN.

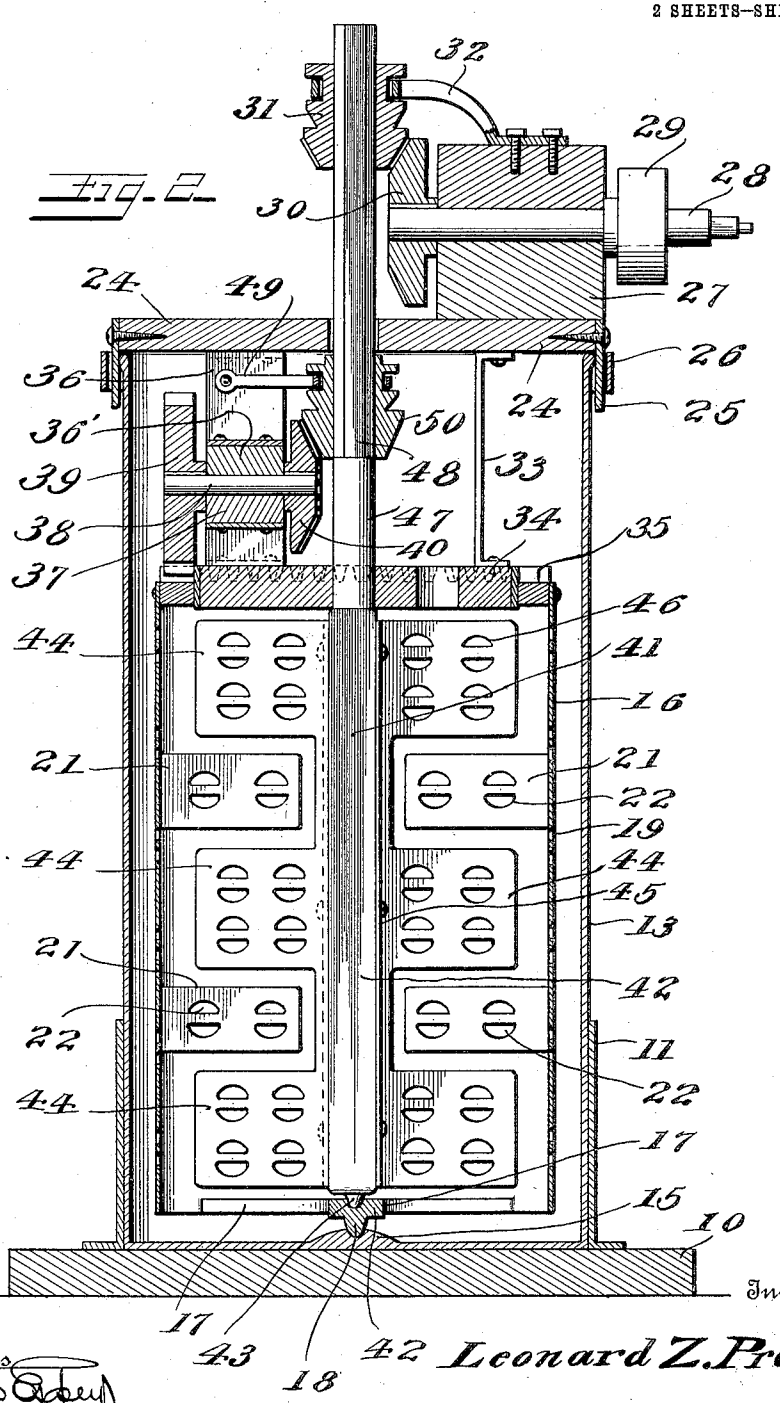
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2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

LEONARD Z. PRESTON, OF LEAVENWORTH, KANSAS.

CHURN.

1,070,728. Specification of Letters Patent. **Patented Aug. 19, 1913.**

Application filed January 22, 1913. Serial No. 743,530.

To all whom it may concern:

Be it known that I, LEONARD Z. PRESTON, citizen of the United States, residing at Leavenworth, in the county of Leavenworth and State of Kansas, have invented certain new and useful Improvements in Churns, of which the following is a specification.

This invention relates to an improvement in churns.

The primary object of the invention is to provide a construction in which the churning may be accomplished in a comparatively short time and by the use of a comparatively small amount of power.

A still further object is to provide a construction which may be quickly assembled and the churning members easily cleansed.

Another object of the invention is to provide a construction in which the cream will be acted upon by interdigitated flat perforated members which move in different directions and at different speeds, thereby producing a more effectual churning mechanism than where the agitating means rotate in the same direction and produce merely a stirring action.

In the drawings; Figure 1 is a side elevation; Fig. 2 is a vertical section; Fig. 3 is a top plan view; Fig. 4 is a section on the line 4—4 of Fig. 1; and Fig. 5 is a detail view of a portion of the agitating cylinder.

In the drawings, 10 designates a base which is provided with a cylinder receiving member 11, the member being formed with curved slots 12. A cylindrical receptacle 13 is received within the base, said receptacle being provided with projections 14 which extend within the slots 12, the receptacle being rotated to dispose the projections 14 at the base of the slots, thereby locking the receptacle against movement with respect to the supporting member 11. The receptacle 13 is of the usual construction being provided with a bearing 15 at its base.

A perforated cylinder 16 is arranged within the receptacle 13, said cylinder being connected at its base by means of transversely disposed arms 17, one of which is formed with a projection 18 which sits within the bearing 15 of the receptacle. The cylinder is in this manner supported to rotate within the receptacle 13. The cylinder is provided with perforations 19 which are substantially semi-circular, a web 20 extending between the semi-circular apertures. Blades 21 are secured interiorly of the cylinder 16, said blades being formed with perforations 22, similar to the perforations in the walls of the cylinder. These blades are of a number consistent with the height of the cylinder and are disposed one above the other, the blades being preferably disposed at diametrically opposite points within the cylinder. A gear 23 is secured to the upper edge of the cylinder, said gear being driven, in a manner to be hereinafter described, to rotate the cylinder on its bearing.

A cover 24 is disposed to rest upon the receptacle 13, the cover being formed with a downwardly disposed member 25 which extends within the sockets 26 formed integral with the receptacle. A bearing block 27 is supported by the cover, said bearing supporting a shaft 28 on which is mounted a sheave 29 over which a drive belt passes. A gear 30 is arranged on the terminal of the shaft 28 remote from the sheave 29, said gear meshing with a pinion 31 which is supported by a bracket 32. It will be noted by this construction that when the shaft 28 is rotated the pinion 31 will be driven.

A plurality of brackets 33 are disposed on the under face of the cover 24, said brackets supporting the circular member 34, the periphery of which is provided with a packing 35, the circular member forming a closure for the cylinder 16. A bracket 36 is supported by the cover 24 and is secured to the cover 24. This bracket supports a bearing block 36′, a shaft 38 being supported for rotation by this block. A gear 39 is mounted on one terminal of said shaft, said gear meshing with the gear 34 which is mounted upon the cylinder 16. A pinion 40 is arranged on the terminal of the shaft 38 remote from the gear 39, said gear being driven in a manner which will be hereinafter described.

A paddle 41 is arranged within the cylinder 16, the transverse beam 17 of the cylinder being formed with a bearing 42. The base of the paddle shaft is provided with a projection 43 which extends within said bearing. A plurality of blades 44 are carried by the paddle, said blades being formed integral with the plates 45 which are secured to the sides of the paddle shaft. The portion of the shaft which is disposed within the cylinder 16 is square in cross section. These blades are provided with perforations 46 and are so disposed with respect to the blades 21 of the cylinder 16

that when the paddle is rotated, the two sets of blades will interdigitate. The portion 47 of the paddle shaft 42 is cylindrical. The upper portion 48 of the shaft is hexagonal, the cover 24 being provided with an opening through which the shaft extends. The bracket 36 is provided with an arm 49 which supports the pinion 50. This pinion is provided with a hexagonal bore through which the hexagonal portion 48 of the shaft extends. The pinion 31 is provided with a hexagonal bore and the upper portion of the shaft extends within this pinion.

It will be noted that when the shaft 28 is driven by any suitable source of power that the paddle shaft will be rotated by means of the pinion 31. As the paddle shaft is rotated the pinion 50 will mesh with the pinion 40 mounted on the shaft 38 which will rotate the shaft 38. The gear 39 will mesh with the gear 34 rotating the cylinder 16. It will be seen by this arrangement of the gears that the paddle and the cylinder 16 will rotate in opposite directions and at different speeds, the liquid thus being agitated by the interdigitating blades which travel in different directions and at different rates of speed.

It will be noted that the material circulates through the blades of the paddle and the cylinder 16 and that it passes through the base of the cylinder 16 as well as through the side walls thereof.

By this construction it will be seen that the cream may be churned in a comparatively short space of time and without the utilization of the amount of power usually necessary when either single or double dasher actuating mechanisms are used.

Particular attention is called to the manner in which the shaft and agitating members are assembled and the fact that they may be readily disassembled for the purpose of cleaning, that is the paddle and the two cover members may be lifted from the receptacle and the paddle member readily cleansed. The cylinder may also be removed from the receptacle and the interior of the receptacle, after the butter has been removed, easily cleaned as there are no obstructions to hold the material.

While the term cylinder has been used, and both the inner and outer receptacles are shown as cylindrical, attention is called to the fact that the receptacles may be of any suitable configuration, the operation of the mechanism in no way depending upon the shape of the receptacles.

I claim—

1. A churn comprising a receptacle, a perforated cylinder supported for rotary movement within the receptacle, a gear carried by said perforated cylinder, a paddle disposed within the cylinder, perforated blades supported by said paddle, blades supported by the cylinder, means for rotating the cylinder and paddle in opposite directions and at different speeds, the blades of the paddle and cylinder interdigitating during their rotation.

2. A churn comprising a receptacle, a perforated cylinder arranged within the receptacle, a paddle supported within said cylinder, means for rotating said paddle and cylinder in opposite directions, and interdigitating perforated blades carried by said paddle and cylinder.

3. A churn comprising a receptacle, a cylinder arranged within the receptacle, a closure for the receptacle, a closure for the upper end of the cylinder removable with the closure for the receptacle, a gear supported by the cylinder, an agitating member arranged within the cylinder, and means for rotating said agitating member and cylinder in opposite directions.

4. A churn comprising a receptacle, a perforated cylinder arranged within the receptacle, said cylinder being provided at its upper end with a gear, a closure for the receptacle, brackets supported by said closure, a closure for the cylinder supported by said brackets, a paddle arranged within the cylinder, said paddle including a shaft which extends through both of the closures, the upper portion of said paddle being irregular in cross section, means for rotating said shaft, a gear carried by the shaft intermediate the closures, a bearing supported by one of the brackets which supports the closure for the cylinder, a gear carried by the cylinder, a shaft supported by said bearing, a gear arranged on said shaft, said gear meshing with the gear carried by the cylinder, and a gear arranged on said shaft and meshing with the gear mounted on the paddle shaft.

5. A churn comprising a receptacle, a perforated cylinder rotatably supported within the receptacle, a paddle rotatably supported within the cylinder, perforated blades supported in spaced relation by said paddle, blades supported interiorly of the cylinder, the blades of the paddle and cylinder being disposed to interdigitate, the paddle including a shaft, the upper portion of which is irregular in cross section, a closure for the receptacle, a driving mechanism mounted on said closure, a pinion supported by said driving mechanism and formed with an irregular bore disposed to slidably receive the paddle shaft, a pinion supported on the under face of said closure and provided with an irregular bore disposed to receive the paddle shaft, a closure for the cylinder supported by and in spaced relation to the closure for the receptacle, a bearing arranged intermediate the closures, a shaft supported by said bearing, a gear carried by the cylinder, a gear arranged on said shaft and meshing with the

gear carried by the cylinder, and a second gear arranged on said shaft and meshing with the gear supported on the under face of the closure for the receptacle.

6. A churn comprising a receptacle, a perforated cylinder rotatably supported within the receptacle, a paddle arranged within the cylinder, a closure for the receptacle, a closure for the cylinder supported by the closure for the receptacle, said paddle including a shaft which extends through the closures, means carried by the closure for the receptacle for driving said paddle, and means arranged intermediate the closures for driving the cylinder.

In testimony whereof I affix my signature in presence of two witnesses.

LEONARD Z. PRESTON. [L. S.]

Witnesses:
ROBERT A. NEILL,
R. T. MCKINNEY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."