D. A. SPRAGUE.

COMBINED CHURN AND BUTTER WORKER.

APPLICATION FILED SEPT. 14, 1908.

908,164. Patented Dec. 29, 1908.

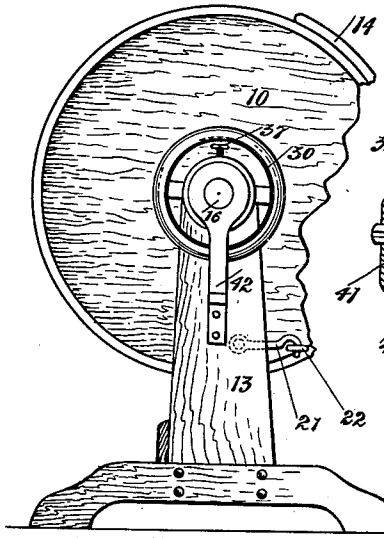


Fig. 1.

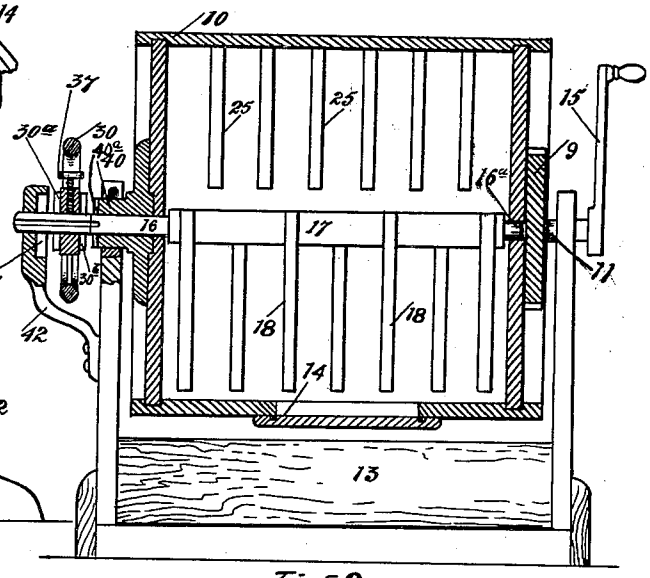


Fig. 2.

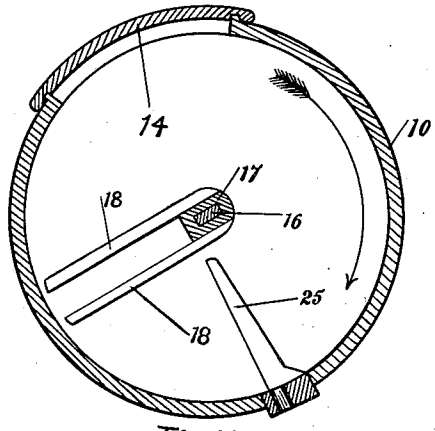


Fig. 3.

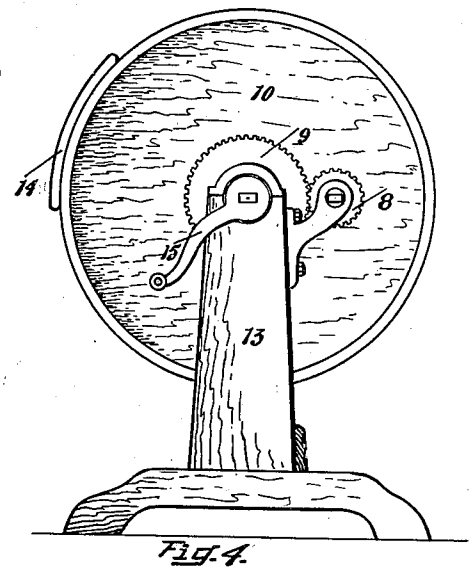


Fig. 4.

WITNESSES:

C. A. Kardell

M. Earl Robinson

INVENTOR

DANIEL A. SPRAGUE

By Robinson, Martin & Jones

ATTORNEYS

UNITED STATES PATENT OFFICE.

DANIEL A. SPRAGUE, OF POLAND, NEW YORK.

COMBINED CHURN AND BUTTER-WORKER.

No. 908,164. Specification of Letters Patent. Patented Dec. 29, 1908.

Application filed September 14, 1908. Serial No. 452,824.

To all whom it may concern:

Be it known that I, DANIEL A. SPRAGUE, of Poland, in the county of Herkimer and State of New York, have invented certain new and useful Improvements in a Combined Churn and Butter-Worker; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

The object of my present invention is to provide a combined churn and butter worker, which is simple in construction, efficient in operation, easily operated, easily cleaned and reasonable in cost of construction.

Figure 1 shows an end view of my present machine, with a section broken away to reduce the size of the figure. Fig. 2 is a longitudinal sectional view of the same. Fig. 3 is a cross sectional view through the body. Fig. 4 shows the opposite end from that shown in Fig. 1.

Referring to the reference figures in a more particular description, 10 indicates the body of the churn, which is of cylindrical form, having heads in each end and all together forming a receptacle mounted on journals 11 and 40 in the standards of the frame 13 for rotation. The body is provided with an opening through which access may be had to the interior for the purpose of introducing the cream, salting, inspecting and removing the butter and washing and cleaning the interior of the receptacle with its accessories. The opening is adapted to be closed by a removable cover 14. For rotating the body on its horizontal axis, the journal 11 is extended and provided with a crank 15. For rotating the body more slowly and with greater power, a gear pinion 8 is provided with a short shaft mounted in a bearing on the standard of the frame and meshing with a gear wheel 9 provided on the body end and preferably made integral with the journal base plate. The crank 15 may be transferred from the journal 11 to the shaft carrying the pinion 8.

Extending longitudinally through the body on the axle line and in the line of the journals 11 and 40 is a shaft 16 incased and provided with a set of substantially radial rigid projecting fingers 18, all together constituting the worker 17. The fingers 18 are well spaced and relatively narrow as compared with the space, and preferably disposed as to their secured ends on both sides of the shaft 16, whereby they are somewhat offset with reference to one another, but all projecting in the same general radial direction from the axis on one side of the axis of the churn body. The shaft 16 with its fingers constituting the worker is rotatable independently of the body of the churn, and at one end has a bearing in and extends through the journal 40, and at the other end has a bearing at the base of the journal 11, but preferably does not extend through.

For controlling the worker there is provided a hand wheel 30 mounted on the externally extended end of the worker shaft 16, preferably by being provided with a square hole receiving a square section of the worker shaft, whereby the hand wheel is held from rotation with reference to the shaft; but the arrangement is such that the hand wheel may be moved laterally along the shaft a limited distance. The hand wheel 30 is provided at one end with clutch teeth or clutch member 30^a, and at the other end with another clutch member 30^b. The clutch member 30^b is adapted, when the hand wheel is shifted in the proper direction, to engage with clutch member 40^a on the end of the journal 40, thereby securing the worker to the body for rotation therewith.

At the outer end of the shaft 16 there is provided a stationary or fixed clutch member 41 supported and held by an arm 42 from the frame. When the hand wheel is shifted in the proper direction, the clutch member 30^a of the wheel may be engaged with the stationary clutch member 41, whereby the worker is held against rotation while the body is adapted to be freely rotated. The arrangement of the hand wheel and clutch members is also such that there is an intermediate position for the hand wheel when both clutches will be out of engagement, at which time the worker is under independent manual control by the hand wheel. The hand wheel has a set screw 37 by means of which it may be secured in any of its several positions of adjustment along the shaft 16.

Within the body the churn is provided with a set of inwardly projecting fingers 25, which are rigidly secured in the wall of the body and extend nearly to the axial line in a radial direction, if desired, but preferably with a somewhat forward inclination as

shown in the drawings. The set of body fingers extend substantially longitudinally of the churn body and are arranged on one side of the axial line substantially in one plane. The body fingers instead of being in a single row might be offset somewhat with reference to each other, substantially as are the worker fingers, and still be in the same general plane on one side of the axis. The body fingers are relati ely narrow and disposed with reference to those of the worker, so as to pass through the middle of the spaces between the worker fingers when they are relatively rotated with liberal clearance space between when passing.

The clutch members 30^b and 40^a will preferably be so arranged that they can be engaged only in one position, and, further, the arrangement will preferably be such that this engagement can only be made when the worker fingers are interposed or interpositioned with the body fingers.

For churning, the combined body and worker fingers constitute a single dasher. In churning, the body should not be filled more than half full of cream. In the revolution the dasher strikes down on the surface of the cream, rakes through the body of the cream, and then passes above the surface, affording ample time for the cream to become settled before repeating the operation. The clearance between the fingers, even when interposed, allows the cream to pass through quite freely. With what might perhaps be considered too rapid a rotation of the churn in churning, the cream might be carried up or forward by the dasher, in which case it would be poured over the shaft and the fall would be effective in churning.

The churning is preferably stopped when the butter has "come" in granular form (as to be noted through a glass covered hole), and the butter milk drawn off and the butter washed and salted. While drawing off the butter milk and salting the butter, the hook 21 may be engaged with the eye 22 to secure the body against rotation. For the purpose of working the butter, the position of the hand wheel 30 will be shifted so as to engage the clutch member 30^a with the clutch member 41. These clutch members are arranged preferably to be capable of engagement only in one position, and that preferably with the worker fingers 18 on a downwardly inclined angle, as shown in Fig. 3 of the drawings. The worker being set, that is to say, secured in a stationary position and the body of the churn rotated in the direction of the arrow shown in Fig. 3, preferably by means of the crank 15 applied to the pinion 8, the butter is gathered between the fingers 25 and 18 and a portion forced through the fingers 18, while a portion escapes backwardly through the fingers 25, effecting a squeezing and breaking or cutting operation, constituting effective working. The portion of the butter which passes through the fingers 18 is carried ahead of the fingers 25 until it is dumped over the shaft 16 and it, together with the butter that has passed backwardly through the fingers 25, is gathered and massed and again forced through the fingers 18 with the next revolution. A few revolutions of the churn body when thus operating will produce a sufficient working. When the working has been completed, the worker will preferably be returned to its former position with the fingers 18 and 25 interposed and secured in that position. The churn now being revolved the more or less broken body of butter will be gathered ahead of the combined fingers and dumped over the shaft. A few revolutions in this operation will mass and pack the butter in a single body and in a desirable condition to be removed from the churn.

The offset position of the fingers 18 on the worker, or the offset position of the fingers 25 on the body if employed, enable the churn to work butter with the application of somewhat less power than though each set of fingers were arranged in a single plane, for obvious reasons. The offset position of the fingers when combined to constitute a dasher also forms a dasher which affords larger passages for the cream between the fingers, which in some views of the matter is an advantage.

Churns require very careful cleaning, for which purpose ready access is desirable to all interior parts. In washing and cleaning this combined churn and butter worker, the hand wheel 30 will be adjusted to its intermediate position, placing the worker readily under the control of the operator and allowing it to be positioned to afford access to all of its parts, and to remove it from any position which would prevent ready access to the body fingers and all parts of the interior of the body.

It is evident that other modifications and changes in and from the construction herein described may be made without departing from the invention hereinafter pointed out and intended to be claimed in the claims.

What I claim as new and desire to secure by Letters Patent is:

1. The combination of a churn body mounted on journals to be rotated on its horizontal axis and having a longitudinal row of inwardly projecting fingers on one side of the axis only, and an axially mounted independently rotatable worker within the body having a single set of outwardly projecting fingers arranged along one side and to operate through the spaces between the body fingers, and means for securing the worker with its fingers in set position and means for securing the worker with its fingers to the body for rotation therewith, substantially as set forth.

2. The combination of a cylindrical churn body mounted on journals to be rotated on its horizontal axis and having a set of inwardly projecting fingers, an independent axially mounted worker within the body having a set of rigid outwardly projecting fingers, means for securing the worker with its fingers in set position while allowing the rotation of the body and means for securing the worker to the body for rotation therewith, substantially as set forth.

3. The combination of a churn body mounted on journals to be rotated on its horizontal axis and having a single set of inwardly projecting fingers arranged entirely at one side of the axial plane of the body, an axially mounted worker within the body having a single set of fingers projecting outwardly from and arranged entirely on one side of the axis, means for securing the worker in set position while allowing rotation of the body and means for securing the worker to the body for rotation therewith and means for independently manipulating the worker, substantially as set forth.

4. The combination of a cylindrical churn body mounted on journals to be rotated on its horizontal axis and having a single set of inwardly projecting fingers arranged entirely at one side of the axis of the body, an axially mounted worker within the body having a single set of fingers projecting outwardly and arranged entirely on one side of the axis and extending substantially to the wall of the receptacle, means for securing the worker in set position while allowing rotation of the body and means for securing the worker to the body for rotation therewith with the body fingers and worker fingers interposed, substantially as set forth.

5. The combination of a churn body mounted on journals to be rotated on its horizontal axis and having a single set of inwardly projecting body fingers arranged entirely at one side of the axis of the body, an independently rotatable axially-mounted shaft within the body having a single set of worker fingers projecting outwardly from and arranged entirely on one side of the shaft and means for securing the worker in set position while allowing rotation of the body, substantially as set forth.

6. The combination in a churn and butter worker of a cylindrical receptacle mounted on journals to be rotated on its horizontal axis having arranged along one side a set of inwardly projecting fingers, a shaft arranged axially in the receptacle passing out through a journal, a hand wheel mounted on the external end of the shaft secured thereto for rotation with the shaft and laterally movable along the shaft and having clutch members at each side, a clutch member on the journal and a stationary clutch member with which the wheel clutch members are adapted to engage respectively, substantially as set forth.

7. The combination in a churn and butter worker of a cylindrical receptacle mounted on journals to be rotated on its horizontal axis and having a single set of inwardly projecting fingers, an independent rotatable shaft having a single set of outwardly projecting worker fingers, means for securing the body and worker fingers in interposed position to provide a single dasher extending from the axis to the receptacle wall and swinging around the axis as the receptacle is revolved, substantially as set forth.

In witness whereof, I have affixed my signature, in presence of two witnesses, this 12th day of September 1908.

DANIEL A. SPRAGUE.

Witnesses:
SARAH E. CLARK,
EMMA S. HESSE.