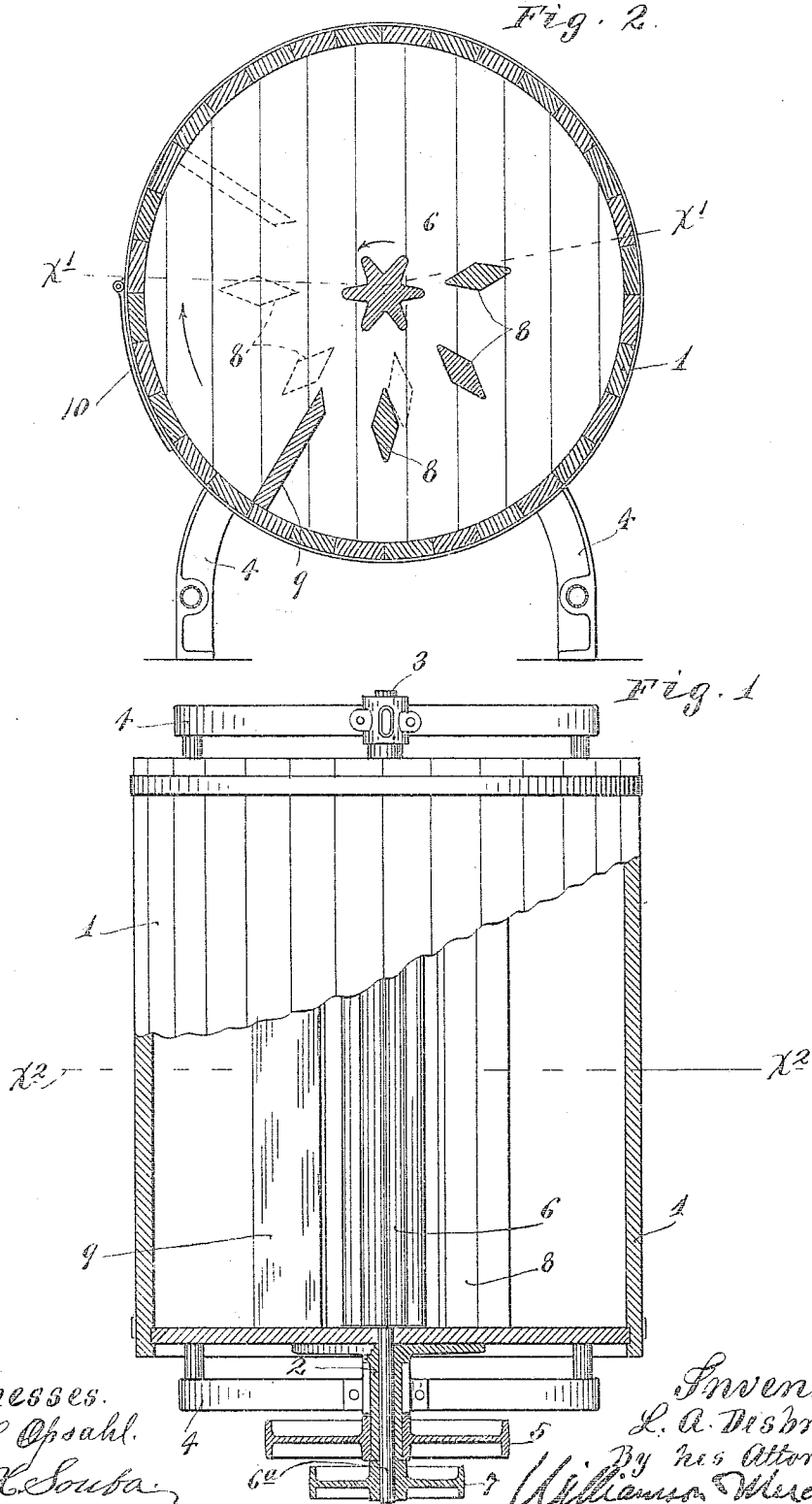


953,738.

Patented Apr. 5, 1910.



UNITED STATES PATENT OFFICE.

LEVI A. DISBROW, OF OWATONNA, MINNESOTA.

COMBINED CHURN AND BUTTER-WORKER.

953,738.

Specification of Letters Patent.

Patented Apr. 5, 1910.

Application filed December 23, 1909. Serial No. 534,592.

To all whom it may concern:

Be it known that I, LEVI A. DISBROW, a citizen of the United States, residing at Owatonna, in the county of Steele and State of Minnesota, have invented certain new and useful Improvements in Combined Churns and Butter-Workers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to combined churns and butter workers and has for its object to simplify the construction and to improve the operation thereof.

To these ends, the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

In the accompanying drawings, which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings, Figure 1 is a view, partly in plan and partly in horizontal section on the line $x^1 x^1$ of Fig. 2; and Fig. 2 is a transverse vertical section taken on the line $x^2 x^2$ of Fig. 1.

The horizontally disposed drum 1 is provided with axially aligned trunnions 2 and 3, journaled in suitable bearings on end brackets of a supporting frame 4. The trunnion 2 is a long tubular trunnion provided, at its inner end, with a flange securely bolted to the adjacent head of the drum, and provided, at its outer end, with a pulley 5, over which a power-driven belt, not shown, may be run to rotate the drum in the direction of the arrow marked thereon in Fig. 2.

Axially disposed within the drum 1 is a corrugated roller 6, the shaft 6^a of which, at one end, projects through and is journaled in the tubular trunnion 2, and, at its extreme outer end, is provided with a pulley 7, over which a power-driven belt, not shown, may be run to rotate the said roller in the direction of the arrow marked adjacent thereto in Fig. 2. The roller 6 should be driven in a direction opposite to the direction of the rotation of the drum and at a relatively high rate of speed and, hence, the pulley 7 is shown as of much smaller diameter than the pulley 5. So far as my present invention is concerned, however, the drum and the roller may be driven either by

one-speed or by two-speed driving mechanism of any suitable construction.

Located within the drum, extended longitudinally from end to end thereof and rigidly secured to the heads of the drum, are sharp edged so-called divider bars 8, which, as shown, are diamond-shaped in cross section and are three in number. Said divider bars, in the direction of the rotation of the drum, are positioned successively farther and farther to the axis of the drum, or in other words, farther and farther to the corrugated working roller 6.

For lifting the butter in the butter-working action, on the rising side of the drum and for delivering the same between the working roller 6 and the divider bars 8, a lifting shelf or wide lifting flight 9 is extended from head to head of the drum and inward from the shell of the drum. This lifting shelf, in the direction of the rotation of the drum, is located considerably ahead of the first divider bar 8 and its inner edge is preferably farther from the roller 6 than is the inner edge of said first divider bar. At a point above the shelf 9, the drum is provided with a segmental door 10 which, of course, is normally closed with a water-tight joint.

In the churning action, the cream will be dashed about and thoroughly agitated by the combined action of the roller 6, the divider bars 8 and the shelf 9, and said shelf, under each rotation of the drum, will raise a large part of the cream and drop the same with a considerable force onto the said roller and divider bars, so that the machine operates as a highly efficient churn. In the butter-working action, the butter will be collected and raised in mass by the shelf 9 and will be delivered between and onto the roller 6 and the first divider bar 8. Under continued rotation of the drum, the butter, partly by its own gravity and partly by the crowding or feeding action of the corrugated roller, will be forced downward between the roller and the divider bars and will fall between the divider bars in long strips so that it will be thoroughly worked and, when salt is added, the salt will be thoroughly commingled with the butter.

In Fig. 2 the dotted lines indicate the position of the drum in which the butter is being delivered from the shelf 9 to the working roller 6 and divider bars. This deliver-

ing action, however, will begin considerably before the drum is rotated as far as is indicated by said dotted lines and will continue for some time thereafter. The full lines in Fig. 2 indicate approximately the proper position in which to stop the drum when the butter is to be removed through the opening normally closed by the door 10.

By setting the divider bars successively farther and farther from the working roller, in the direction of the rotation of the drum, the greatest space is allowed for the initial passage of the butter and then, as the butter diminishes in volume, the space between the roller and the divider bars is decreased, so that the roller will contain its proper working efficiency.

As is evident, the churn above described is of very simple construction and of comparatively small cost. Furthermore, it is highly efficient, both as a churn and as a butter worker.

What I claim is:

1. In a machine of the kind described, a rotary drum provided with an axial roller and a multiplicity of divider bars extended longitudinally of said drum and circumferentially spaced in respect to said roller, substantially as described.

2. In a machine of the kind described, the combination with a horizontal rotary drum, of an axial roller therein, a multiplicity of divider bars extended longitudinally within said drum and circumferentially spaced in respect to said roller, and a lifting shelf within said drum for raising the butter and delivering the same onto said roller and divider bars, substantially as described.

3. In a machine of the kind described, the combination with a horizontal rotary drum, of a working roller axially located therein, a multiplicity of divider bars extended longitudinally within said drum, circumferen-

tially spaced in respect to said roller and located successively farther and farther from said roller in the direction of the rotation of said drum, substantially as described.

4. In a machine of the kind described, the combination with a horizontal rotary drum, of a working roller axially located within said drum, a multiplicity of divider bars extending longitudinally within said drum, circumferentially spaced in respect to said roller and located successively farther and farther apart in the direction of the rotation of the drum, a lifting shelf extending inward from the shell of said drum for raising the butter and for delivering the same onto said roller and divider bars, and means for rotating said drum and roller in reverse directions, substantially as described.

5. In a machine of the kind described, the combination with a horizontal rotary drum having a hollow trunnion at one end, a corrugated working roller axially located within said drum and provided with a shaft journaled in and extended outward through said hollow trunnion, a multiplicity of divider bars extended longitudinally within said drum and circumferentially spaced in respect to said working roller, a lifting shelf extending inward from the shell of said drum and from head to head thereof for raising the butter and delivering the same onto said working roller and divider bars, and driving connections to said drum and to the shaft of said roller for rotating the same in reverse directions, substantially as described.

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

LEVI A. DISBROW.

Witnesses:

F. A. DUNHAM,
MARY KRAUSE.