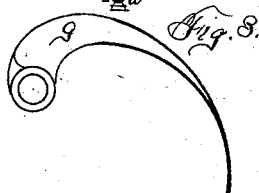
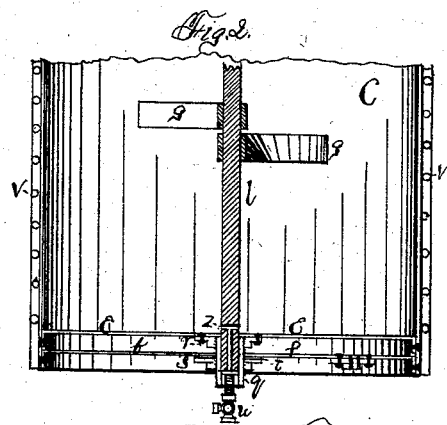
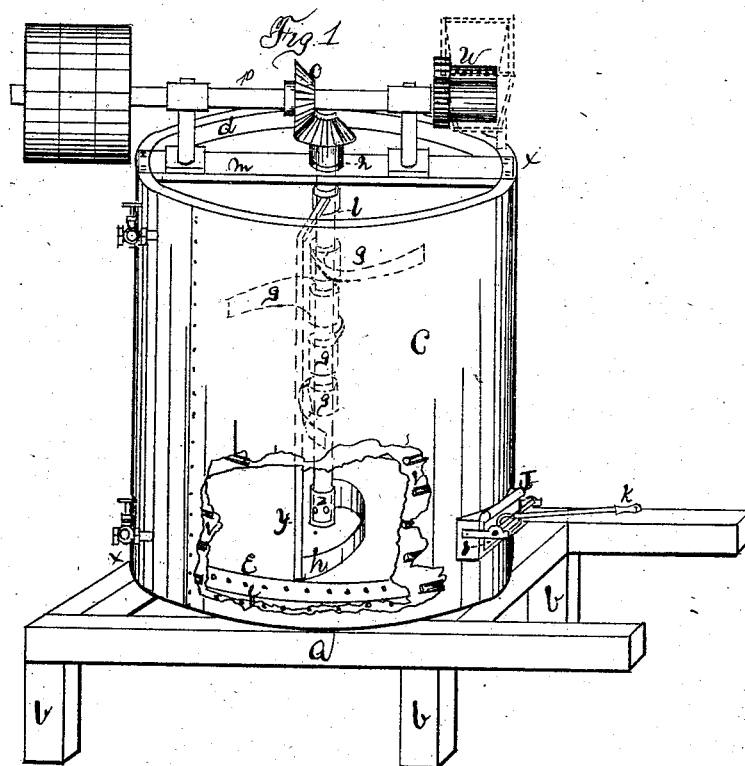


(No Model.)

R. FREELAND.
SOAP MAKING MACHINERY.

No. 259,842.

Patented June 20, 1882.



WITNESSES

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ROBERT FREELAND, OF BOSTON, MASSACHUSETTS.

SOAP-MAKING MACHINERY.

SPECIFICATION forming part of Letters Patent No. 259,842, dated June 20, 1882.

Application filed January 3, 1882. (No model.)

To all whom it may concern:

Be it known that I, ROBERT FREELAND, a subject of the Queen of Great Britain, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Soap-Making Machinery, of which the following description, in connection with the accompanying drawings, is a specification.

My invention relates to improvements in and additions to that class of soap-making machinery known as "soap-mixers" or "crutchers," in which a central vertically-rotating shaft provided with suitable blades to act as mixers operates in conjunction with an upright cylindrical tank or receptacle for the ingredients used in processes of soap-making; and the objects of my improvements are, first, to provide curved mixer-blades of such shape, and at the same time of simple construction, that when the shaft is revolved in the direction of said curve a more perfect upward central current and downward exterior current of the said ingredients will be caused than by blades of the ordinary construction, and that when the shaft is revolved in the opposite direction the currents will be reversed, thus obtaining a complete mixing or crutching; second, to provide means for cutting and reducing soap scraps, should it be desirable to use the machine as a remelter; third, to afford greater facilities for the drawing off of thick soaps after a boiling than as now given by the use of a gate in the bottom; fourth, to afford means for the proper introduction of live steam and liquids into the soap itself in the process of boiling, and for the eduction of lye and other fluids from the bottom of the machine; and, fifth, a steam or water jacketed bottom and sides of simple construction, as herein to be described.

The main objects of the invention, as a whole, are the combination into one easily-made machine, of low price, of the various machines used in soap-making, and the production of a single apparatus which can be used, either in whole or in part, in all of the many processes. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical elevation of the entire machine, a portion of the side thereof being

removed in order to show the interior construction. Fig. 2 is a sectional elevation through the line *xx*; Fig. 3, a top view of one of the mixing-blades removed.

Similar letters refer to similar parts throughout the several views.

The table or frame *a* and its legs or standards *b b* constitute the support of the machine, and may be of a construction suited to its location. *c*, the wrought-iron shell, riveted together in the usual manner, and strengthened by the angle-iron band *d* at its upper edge, is riveted to the double bottom *e* and *f*. The said bottoms *e* and *f*, separated by the width of the flange of *e*, contain the steam or water space referred to.

g are the soap-mixing blades, of the shape as shown in Fig. 3, and are centripetal-acting when revolved in the direction of the curve, thus producing the upward current about the shaft, as the only relief from the centripetal action of the blades is upward. The downward current about the sides is produced by the rushing of the fluid to the center to supply that which is drawn up by the blades. If the said blades are revolved in a direction opposite to the curve, it is evident that the blades will act centrifugally and the current be reversed, as hereinbefore stated. The portions of the blades away from the shaft are nearly vertical, thus (if revolved in the direction of the curve) drawing the fluid to the center, while the portions of the blades next the shaft, being inclined, relieve the pressure on the center and allow the escape of the fluid in an upward direction.

h is the emptying-blade, curved as shown in Fig. 1, and forces the soap out of the gate *i* if revolved in the direction away from its curve.

The aforesaid blades may be made either of wrought or cast iron, and may be attached to the shaft by keys, set-screws, or other suitable means.

The emptying-gate *i*, hinged at *j* and operated by the lever *k*, is faced with rubber or other packing to secure a water-tight joint.

The lever *k*, hinged at a point in front of and below the center of the said gate *i*, is curved at the extremity nearest the gate, as shown in Fig. 1, in such a manner as to act as a cam when the handle is depressed, thus obviating

the necessity of a weight or other means of confining the said lever in order to get a tight joint. When the handle is raised a chain connecting the said gate with the said lever may be used to open the gate; or a staple passing over the said cam end, firmly attached to the said gate, may be used in its place. If the lever *h* is carried beyond its hinge and allowed to rest against the machine, its gravity is sufficient to keep the gate open.

A cock may be screwed into the lower part of the said gate on a level with the bottom *e* for the purpose of drawing out lye or other liquids.

The shaft *l* is supported from the channel-iron bridge *m* by the step *n*, and is turned by the bevel-gear *o* upon the shaft *p*, at the end of which are the usual tight and loose pulleys, commonly used to produce a reversing motion. The shaft *p* revolves on journals which are attached by standards which are bolted to the said bridge *m*, which is in turn bolted to the flange of the said angle-iron band *d*. The bottom of the shaft turns in the brass bushing *q*, as shown in Fig. 2, which is screwed into the flange *r*, which in turn is riveted to the bottom *e*. The flange *s* is screwed on the said bushing *q*, and is separated by the rubber packing *t* from the bottom *f*. The aforesaid flanges and bushing also serve to keep the bottoms from spreading when under the pressure of steam.

Into the lower end of the bushing *q* is screwed a reducing-bushing, to which the three-way cock *u* is attached by a nipple, for the purpose of introducing steam or liquids or drawing out lye, as the occasion may require.

The shaft *l* is drilled longitudinally at its lower end to a short distance above the bottom *e*, at which point several holes are drilled at right angles to the said shaft, meeting the aforesaid longitudinal hole. This is used as the direct passage, in connection with the bushing *q*, from the cock *u* to the interior of the machine, for the purpose as described above.

The shell *c* is surrounded by the coil of pipe *v*, which may be used in heating by steam or in cooling by water the sides of the tank, as occasion may require. The exterior of the coil may be covered by a casing of wood or other suitable material, to prevent loss of heat by radiation.

Feed-rolls *w* may be attached or geared to the shaft *p* for the purpose of feeding or grinding into the tank various materials used in soap-making, or may be used to operate in connection with the sharp-edged mixer-blades *g* in reducing and cutting soap scraps when used as a remelter.

An upright scraper-blade, *y*, may be attached to the end of the emptying-blade *h*, and by an arm at its upper end to the shaft *l*, for the purpose of freeing the sides from an accumulation of soap materials.

Flanges are fastened to or holes drilled and tapped in the bottom *f* for the purpose of attaching the necessary steam and water pipes.

The said pipes may be connected directly with the jacket-coil or not, as desired.

The modes of operating the machine differ with each separate process. One or more of the various attachments or appliances may be used. Thus for a mere mixing or crutching the rotating blades alone may be used. To obtain a boiling, the introduction of live steam may be employed, either with or without the aid of one or both jackets; for a remelting, as described above, &c.

It is obvious that there may be many modifications in the detail construction of the machine without departing from the spirit of my invention. The bottoms may be concaved instead of flat, as represented in the drawings, and the gate may be under the shaft, in which case the soap would be discharged by a centripetal-acting blade instead of centrifugal, as shown, &c.

It is often desirable in certain processes of soap-making to manufacture the soaps under the pressure of live steam. This can readily be accomplished by the use of my herein-described machine. Should it be found desirable to use it in this way or for this purpose, it would be necessary in the construction of the machine to make the shell *c* somewhat stronger by either increasing its thickness or by the use of iron bands, in order that it may be able to withstand the pressure of steam from within. A steam-tight removable cover would have to be used. The said cover could easily be attached to the angle-iron band *d* and bridge *m* by the use of swing-bolts or other suitable devices, rubber packing being interposed to make the joint tight. A stuffing-box of ordinary construction should be used about the shaft *l* on the said bridge *m*.

I do not confine myself to the application of the above-described apparatus for soap-making alone. It is obvious that it can be used in mixing, boiling, or manufacture of various articles, such as sugars, paints, clay, oils, &c.

I am aware that prior to my invention that class of soap-making machines known as "crutchers" have been made in which a vertical rotating shaft provided with blades has been used to produce agitation; also, that some have been provided with jackets for the use of water or steam. I therefore do not claim such a combination, broadly; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. In a soap-making machine, the combination of an upright cylindrical jacketed tank and fluid-inlets, horizontal driving-shaft with feed-rolls attached or geared thereto, vertical centrally-located bridge, supported rotating shaft therein, and curved centripetal or centrifugal acting mixer-blades attached thereto, with the centrifugal emptying blade or blades and gate, constructed in the manner as and for the purpose substantially as described.

2. In a soap-making machine, the shell *c*, surrounded by the continuous pipe-coil jacket

v and covering thereon, with the double bottom *ef* riveted to the said shell and strengthened by the bushing and flanges, as described.

3. In a soap-making machine, the shaft *p* 5 and feed-rolls *w*, for the purpose as described.

4. The angle-iron band *d* and the channel-iron bridge *m* and step *n*, with an upright cylindrical tank, constructed as set forth.

5. The curved sharp-edged centripetal and 10 centrifugal acting mixer-blades *g*, with the upright rotating shaft *l*, constructed in the manner as and for the purpose described.

6. A vertical rotating shaft, centrifugalemp-tying-blade *h*, attached thereto, and scraper-

blade *y*, with the emptying-gate *i* and cam- 15 lever *k*, substantially as described.

7. The combination of the bushing *q* with the flanges *r* and *s* and packing *t*, constructed in the manner and for the purpose substantially as described. 20

8. The shaft *l* and holes or passages *z*, combined with the bushing *q* and cock *u*, for the purpose described.

ROBERT FREELAND.

Witnesses:

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