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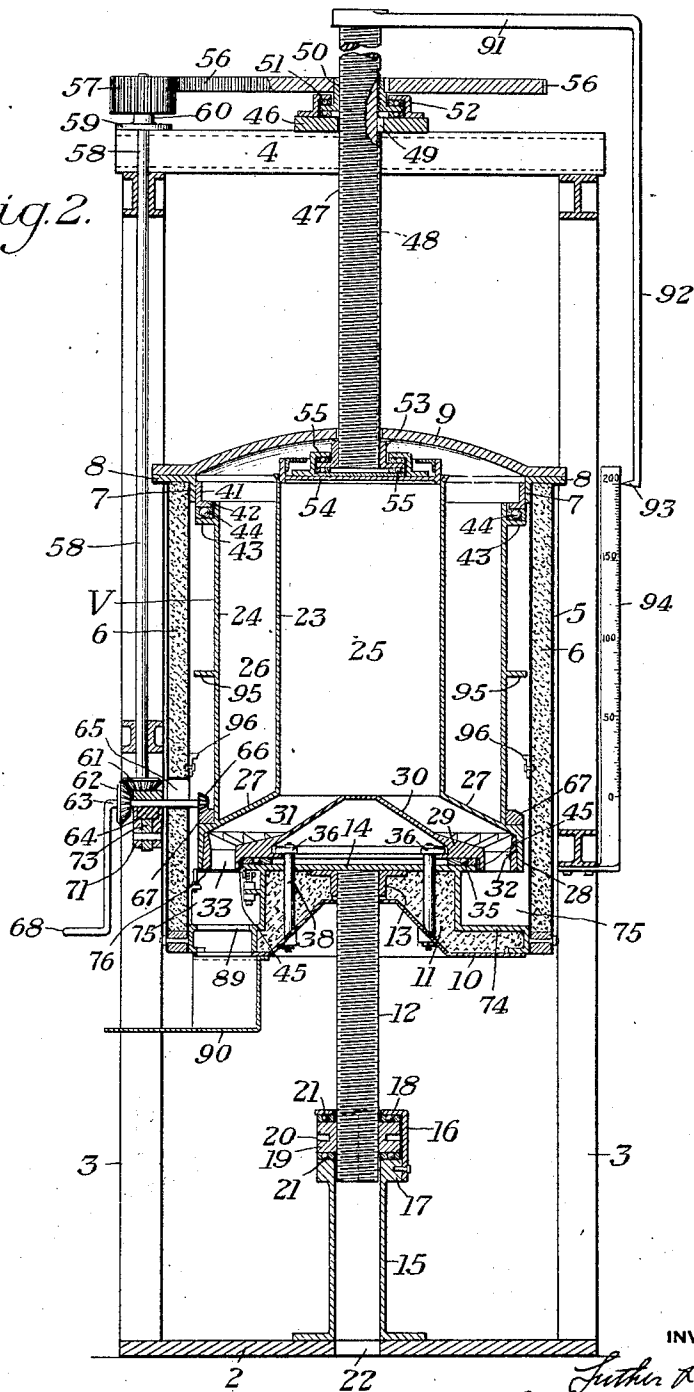
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PORTIONING APPARATUS

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3 Sheets-Sheet 2

Fig. 2.



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PORTIONING APPARATUS.

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The present invention relates broadly to dispensing apparatus, and more particularly to apparatus for forming bulk butter into portions or prints of a uniform size.

5 Butter is usually shipped from the creameries in wooden tubs. The purpose of the invention is to provide apparatus adapted to receive the contents of one or more tubs and to dispense the same in portions hav-
10 ing a weight, for example, of one or several pounds.

A preferred embodiment of the invention is disclosed in the accompanying drawings, in which—

15 Figure 1 is an elevation of the apparatus;
Figure 2 is a section on the line II—II of Figure 1;

Figure 3 is a section on a larger scale of a portion of the apparatus;

20 Figure 4 is a fragmentary view on a larger scale of the means for dividing the material into separate bars as it is extruded from the apparatus; and

25 Figure 5 is a perspective view on a larger scale of a detail of the construction.

In the illustrative embodiment of the invention, 2 represents the base of the apparatus from which rise two spaced vertical A-shaped standard 3 connected at their
30 upper ends by two channel members 4 spaced a short distance apart and each resting upon a side with their channels facing outwardly.

Supported by the standards between the
35 same is a cylindrical outer vessel 5 having spaced metal walls, the space between which is filled with a suitable heat insulating material 6. Fitting in the vessel 5 at its upper end is a ring 7 having a horizontal flange
40 8 extending over said upper end, and seated on said flange is a cover 9. Fitting in the lower end of the vessel is a removable bottom 10 which is hollow and filled with heat insulating material 11. This bottom
45 is mounted upon the upper end of a threaded post 12 which is screwed into an internally-threaded sleeve 13 projecting downwardly from the center of the upper horizontal plate 14 of the bottom. Projecting
50 upwardly from the base 2 is a hollow column 15 secured to the upper end of which is the housing shown in detail in Figure 5. This housing has a vertical curved wall 16
55 secured at its lower edge to a flange 17 on the upper end of the hollow column and

cut away on one side and a horizontal wall 18 provided with a central opening to receive the post 12. Arranged between the flange 17 and wall 18 is a nut 19. This nut is mounted on the post 12 and has spaced
60 openings 20 accessible through the cut-away portion of the wall 16, whereby the nut may be turned by means of a suitable tool to raise or lower the post 12, suitable ball bearings 21 being arranged between the upper and
65 lower faces of the nut and the flange 17 and wall 18. The base 2 is provided with an opening 22 beneath the hollow column 15 to receive the post 12 when the same is lowered.
70

Mounted within the outer vessel 5 for rotation about a vertical axis is an inner vessel V having spaced cylindrical walls 23 and 24 providing a cylindrical container 25
75 for the material to be portioned surrounded by a jacket space 26 adapted to be filled with a suitable refrigerating material, such as cracked ice. The walls 23 and 24 are connected at their lower ends by a downwardly and outwardly inclined annular wall
80 27, and extending downwardly from the lower edge of said wall is an integral vertical annular flange 28 which is offset outwardly from the wall 24. Slidably fitted within the flange 28 is a bottom 29 for the
85 container 25. This bottom has a central annular cone-shaped wall 30 substantially parallel with the wall 27 and providing an annular outwardly flared space 31 between said walls through which the material is extruded
90 from the container 25. The space 31 communicates at its lower end with a vertical annular passage 32 adjacent the periphery of the bottom 29, and arranged in this annular vertical passage is a series of equally-
95 spaced radial partitions 33 having oppositely beveled knife edges 34 at their upper ends, whereby to divide the extruded material into a plurality of vertical bars. The openings between the partitions 32 are preferably rectangular so as to give the bars a corresponding cross section. The thickness of the partitions is such as to ensure a sufficient spacing
100 of the bars of extruded material to prevent such bars from sticking together after passing through the openings between the partitions.

The bottom 29 and the parts carried thereby are rotatably supported on the bottom 10
105 of the outer vessel 5, a ball bearing 35 being

interposed between the plate 14 and the bottom 29. The bottom 29 is detachably secured to the bottom 10 by catches 36 mounted to turn on bolts 37 carried by the plate 14 and spaced from said plate by sleeves 38 surrounding the bolts. These catches are adapted to be turned into a position to project over a flange 39 on the bottom 29, being spaced slightly above such flange by the sleeves 38 in order not to retard rotation of the bottom 29 and parts carried thereby. By loosening nuts 40 on the upper ends of the bolts 37, the catches 36 can be turned into a position to permit the bottom 10 to be separated from the bottom 29.

Fitted in the ring 7 at the upper end of the outer vessel 5 is a ring 41 having a horizontal inwardly-extending flange 42, and interposed between said flange and a flange 43 projecting from the wall 24 adjacent the upper end thereof is a ball bearing 44. It will be noted that the flange 42 surrounds the upper end of the wall 24 and that the inner wall 45 of the opening 32 surrounds the edge of the plate 14, whereby the inner vessel V is maintained in correct position during rotation thereof.

A plate 46 is mounted upon the upper sides of the channels 4 and has an opening therein to receive a vertical screw-threaded stem 47 having a longitudinal groove 48 extending from end to end thereof in which engages a projection 49 on the plate, whereby the stem is permitted to slide through the opening in said plate but is held against turning therein. A nut 50 engaging the stem 47 is held for rotation in ball bearings 51 on the upper side of the plate 46 by a retaining member 52. The lower end of the stem is screwed into a sleeve 53, and rotatably mounted on the latter is a plunger 54 working in the container 25, ball bearings 55 being provided to reduce friction between the sleeve and plunger.

The nut 50 has fast therewith a large gear 56 which meshes with a pinion 57 on the upper end of a vertical shaft 58 slidably mounted in one of the A-shaped standards 3. The upper end portion of this shaft extends between the channel members 4 and through a plate 59 extending across and resting upon the upper sides of said channel. A collar 60 on the pinion 57 engages this plate and limits the downward movement of the shaft 58. The lower end of the shaft 58 has a bevel pinion 61 thereon meshing with a bevel pinion 62 on a transverse shaft 63 mounted in a bearing block 64 and extending through a vertical slot 65 in the vessel 5. A small bevel pinion 66 is secured to the inner end of the shaft 63 and meshes with a ring gear 67 mounted on the upper edge of the offset vertical flange 28 at the lower end of the rotary vessel V. The shaft 63 is

adapted to be turned to rotate the vessel V by means of a handle 68 integral therewith.

The bearing block 64 is supported upon the upper side of a cross-bar 69 of the standard 3 and is guided for vertical movement between upstanding lugs 70 on said cross-bar. Pivoted beneath said bearing block between downwardly-extending lugs 71 on said cross-bar is a lever 72 having a cam portion 73 at one end thereof in engagement with said bearing block. By turning the lever 72 into a vertical position, the bearing block can be raised to disengage the bevel pinion 66 from the ring gear 67 and held in such position by said cam portion. The shaft 58 will be raised simultaneously with the raising of the bearing block but this will not cause the pinion 57 to become disengaged from the gear 56 for the reason that the pinion 57 is considerably thicker than the gear 56.

The bottom 10 of the outer vessel 5 has a peripheral horizontal flange 74 offset considerably below the upper face of said bottom and positioned directly beneath the annular opening 32 in the bottom 29 of the container 25. The bars of material are extruded into the annular space 75 above said flange and are adapted to be divided into portions of a predetermined length by a cutter in the form of a wire 76 positioned in the space 75 and extending horizontally across the opening 32 and substantially in contact with the lower edges of the walls defining said opening. A post 77 rises from the outer edge of the flange 74 and has a lateral projection 78 at its upper end. A pin 79 is mounted in said projection and held in adjusted position by lock nuts 80. Projecting from the vertical wall 81 of the bottom 10 and integral therewith is a vertical sleeve 82 in which is slidably mounted a screw 83 held in adjusted position by lock nuts 84. The screw 83 has a vertical lug 85 projecting from its upper end in which is slidably mounted a horizontal screw 86. The wire cutter 76 is fastened at one end to the upper end of the pin 79 and at its other end to a lug 87 on one end of the screw 86. A nut 88 mounted on the screw 86 and engaging the lug 85 enables the wire to be given the proper tension. As clearly shown in Figure 4, the wire 76 is arranged on a diagonal to the faces of the partitions 33. The angle of inclination of the wire to said faces can be varied by loosening the lock nuts 84 and turning the screw 83 to vary the position of the lug 85. It will also be apparent that the vertical position of the wire can be adjusted by adjustment of the pin 79 and screw 83.

The flange 74 has a rectangular opening 89 therein directly beneath the wire 76 to permit the severed portions of the material to drop onto a shelf 90 carried by the bottom 10.

Secured to the upper end of the stem 47 is an arm 91 integral with the outer end of which is a downwardly extending arm 92 having a pointer 93 on its lower end for cooperation with a vertical scale 94 carried by one of the standards 3 and having graduations thereon to indicate the quantity of material in the container 25.

The operation of the apparatus is as follows: assuming the parts to be in the relative positions illustrated in Figure 2 with the container 25 empty, the lever 72 will be turned into a vertical position to cause the cam to raise the bearing block 64 and disengage the pinion 66 from the ring gear 67. The handle 68 will then be turned in a direction to raise the stem 47 and the plunger 54. As the plunger leaves the upper end of the container 25, it engages and carries the cover 9 with it. When the plunger and cover have been raised to a sufficient elevation to give ready access to the container 25 and space 26, the latter may be filled with ice and the container may have the contents of one or more tubs of butter placed therein. Since the tubs are usually of frustro-conical form, the contents thereof will have the same form when first placed in the container. After the butter has been placed in the container, the handle 68 will be turned in a direction to lower the plunger into the upper end of the container and reset the cover 9 on the flange 8. The handle will be further rotated to compress the butter in the container to bring it to the cylindrical form of the container. The abrupt change in direction caused by the outward flare of the annular passage 31 and the consequent friction between the walls 27 and 30 enables sufficient pressure to be brought upon the butter in the container to bring it into this cylindrical form without forcing any substantial amount of the butter into the passage 31. The lever 72 will now be turned into the horizontal position shown in Figure 1, thereby permitting the bevel pinion 66 to engage the ring gear 67. At this point, the position of the pointer 93 on the scale 94 may be noted in order to determine the quantity of butter in the container. Further rotation of the handle 68 in the same direction as previously will cause the plunger 54 to force the butter through the inclined annular space 31 and through the annular passage or opening 32, the butter being divided by the partitions 33 into a plurality of vertical bars as it is extruded through the opening 32.

The rotation of the container causes the wire cutter 76 to successively engage and cut transversely through the several bars. Since the butter is being extruded at a uniform rate through all of the openings between the partitions, the first complete revolution of the container will result in portions being cut from the several bars varying in

length from substantially zero to a maximum. After one complete revolution of the container, the rotation thereof may be stopped and the unequal portions of the butter removed from the shelf 90 and replaced in the container. Of course, it will be apparent that, in order to do this, it will be necessary to again disengage the bevel pinion 66 from the ring gear 67 and operate the handle 68 in a direction to remove the plunger from the container. When these unequal portions of the butter have been replaced in the container, the handle 68 may be turned in a direction to cause the plunger to compact them with the remainder of the butter in the container before the pinion 66 is again brought into engagement with the gear 67. The rotation of the container may now be resumed and portions of uniform length will be cut from the extruded bars by the cutter 76. It will be apparent that once the machine has been put in operation in this manner, the passage 31 and opening 32 will always remain filled with butter, so that the above-described preliminary operation involving the replacing in the container of the portions of butter cut during the first revolution thereof will be unnecessary. The position of the pointer 93 on the scale 94 will always indicate the quantity of butter in the container 25, so that when the supply becomes low, a further supply of butter may be placed in the container. When it is desired to clean the container and its bottom, the bottom can be separated from the container by turning the nut 19 to lower the post in the hollow column 15. During the first portion of the downward movement of the post, the bottom will be drawn down with it and the inner vessel V will also move downwardly with the bottom until a flange 95 projecting from the wall 24 comes into engagement with lugs 96 fastened to the inner wall of the outer vessel 5. Further downward movement of the bottom will separate the same from the container, and the nuts 40 may then be loosened and the catches 36 turned into a position to permit removal of the bottom 29 from the bottom 10 for cleaning. When the vessel V is in its lowered position, the lower end thereof will be readily accessible for cleaning through the lower end of the outer vessel 5.

It has been found in actual practice that the provision of a cutting wire in substantial contact with the walls defining the discharge opening in an apparatus of the present character is extremely important. If the cutting wire becomes spaced even to a very small extent from such discharge end, the butter being cut thereby is rolled over and over beneath the wire so that clean even cuts are not produced. Furthermore, the butter not being supported substantially in the plane of cutting results in a rough uneven tearing or

breaking thereof. In accordance with the present invention, by means of the adjustments provided, the cutting wire can always be maintained in or substantially in contact with the discharge end of the apparatus.

It is also of importance to provide a cutting wire of the character described herein which is so arranged that it is maintained at all times out of parallelism with any of the walls of the discharge openings. Due to its location, the final shearing effect is concentrated on a comparatively small corner of an individual bar of extruding butter, thereby insuring the severing and dropping of the desired length therefrom. Where it is attempted to cut a substantial length of a bar, such, for example, as represented by one of the smaller dimensions of an ordinary pound print of butter, difficulty is encountered in producing a clean cut. This is entirely obviated in accordance with the present invention.

In the operation of an apparatus of the character herein disclosed, it will be apparent that the gearing may be varied as desired for controlling the lengths cut at each operation, or different screw-threaded stems may be substituted with threads having different pitches to determine the amount extruded between successive cutting operations. In either event, however, during the operation of the apparatus, there will be a uniform relative movement between the material being extruded and the cutting means. This uniformity is highly desirable, as it entirely eliminates any throwing of the severed units, such as occurs when the cutting wire is given an accelerated or non-uniform cutting movement.

While I have shown and described a preferred embodiment of my invention, it will be understood that changes may be made in the details of construction without departing from the spirit of the invention or scope of the appended claims.

I claim:

1. A portioning machine, comprising a container for the material to be portioned, means for extruding the material from one end of the container, means at said end of the container defining an outwardly-flared annular passage for the material, means at the outer end of said passage for causing the material to be extruded in a plurality of bars, a cutter arranged adjacent said passage, and means for producing relative movement between said cutter and container for cutting the bars into portions, substantially as described.

2. A portioning machine, comprising a container for the material to be portioned, means for extruding the material from one end of the container, means at said end of said container defining a passage for the material inclined abruptly to the axis of the

container and for causing it to be extruded in bar form, a cutter arranged adjacent said passage, and means for producing relative movement between the cutter and container for cutting the extruded material into portions, substantially as described.

3. A portioning machine, comprising a container for the material to be portioned, means for extruding the material from one end of the container, means at said end of the container defining an outwardly-flared annular passage for the material and terminating in an annular opening having means therein for dividing the material into a plurality of bars, a cutting edge extending transversely across said annular opening substantially in contact with the walls defining said opening, and means for producing relative rotation between said cutter and container for cutting said bars into portions, substantially as described.

4. A portioning machine, comprising a container for the material to be portioned, means for extruding the material from one end of the container, means at said end of the container defining an outwardly-flared annular passage for the material and terminating in an annular opening having means therein for dividing the material into a plurality of bars, a cutting edge extending transversely across said annular opening substantially in contact with the walls defining said opening, and means for producing substantially uniform relative rotation between said cutter and container for cutting said bars into portions, substantially as described.

5. A portioning machine, comprising a container for the material to be portioned having an outwardly-flared annular wall at one end thereof, a cone-shaped wall within said annular wall and defining therewith an outwardly-flared annular passage, means for extruding the material within said container through said passage, means at the outer end of said passage for dividing the material into a plurality of bars, a cutter, and means for producing relative rotation between said cutter and container for cutting said bars into portions, substantially as described.

6. A portioning machine, comprising a rotatably mounted container for the material to be portioned, means at one end of said container defining an outwardly-flared annular passage, means for extruding the material within said container through said passage, means at the outer end of said passage for causing the material to be extruded therefrom in a plurality of bars, a stationary cutter, and means for rotating said container to cause said cutter to sever said bars into portions, substantially as described.

7. A portioning machine, comprising a rotatably mounted container for the material

to be portioned, means at one end of said container defining an outwardly-flared annular passage, means for extruding the material within said container through said passage, means at the outer edge of said passage for causing the material to be extruded therefrom in a plurality of bars extending parallel to the axis of the container, a stationary cutter, and means for rotating said container to cause said cutter to sever said bars into portions, substantially as described.

8. A portioning machine, comprising a container for the material to be portioned, means for extruding the material from one end of the container, a bottom for said end of the container having means for causing the material to be extruded in a plurality of bars, a cutter, means for producing relative movement between said cutter and bottom for cutting said bars into portions, and means for producing relative movement between said container and bottom to separate said bottom from said container, substantially as described.

9. A portioning machine, comprising a container for the material to be portioned, means for extruding the material from one end of the container, a bottom for said end of the container having means for causing the material to be extruded in a plurality of bars, a cutter, means for rotating said container and bottom to cause said cutter to cut said bars into portions, a support for said bottom upon which the latter is rotatably mounted, and means for adjusting said support to separate said bottom from said container, substantially as described.

10. A portioning machine, comprising a container for the material to be portioned rotatable about a vertical axis, means for extruding the material through the lower end of said container, a bottom for said end of the container rotatable with the latter, said bottom having an opening therein and means in said opening for causing the material to be extruded therethrough in a plurality of bars, a support upon which said bottom is rotatably mounted, means for rotating said container and bottom, a cutting edge extending across and in substantial contact with the walls of said opening for cutting said bars into portions, and means for adjusting said support vertically to separate said bottom from or engage it with said container, substantially as described.

11. A portioning machine, comprising a rotatably mounted container for the material to be portioned, a plunger working in said container for causing the material to be extruded therefrom, said container having a relatively small orifice for causing the material to be extruded in bar form, a cutter for cutting the extruded material into portions upon rotation of said container, operating means for simultaneously rotating said con-

tainer and moving said plunger therein, and means for disconnecting said operating means from said container without disconnecting it from said plunger, whereby to permit said plunger to be moved in the opposite direction by said operating means without rotating said container, substantially as described.

12. A portioning machine, comprising a support, a vessel supported thereby, a container for the material to be portioned arranged within said vessel for rotation about a vertical axis, means for causing the material to be extruded through the lower end of said container, a bottom for said end of the container rotatable with the latter, said bottom having an opening therein and means in said opening for causing the material to be extruded therethrough in a plurality of bars, a cutter arranged adjacent said opening for cutting said bars into portions upon rotation of said container, means for rotating said container, a support upon which said bottom is rotatably mounted, means for adjusting said support to simultaneously lower said bottom and container, and means for limiting downward movement of said container, whereby further lowering of said support separates said bottom from said container, substantially as described.

13. A portioning machine, comprising a container for the material to be portioned mounted for rotation about a vertical axis and having a removable bottom through which the material is adapted to be extruded in bar form, a plunger device in said container for causing extrusion of the material therein, a cutter arranged adjacent said bottom for cutting the extruded material into portions upon rotation of said container, means for rotating said container and simultaneously causing the extrusion of the material through said bottom, a support upon which said bottom is rotatably mounted, means for adjusting said support to withdraw said bottom from said container, and means detachably securing said bottom upon said support, substantially as described.

14. A portioning machine, comprising a container for the material to be portioned, said container having a bottom provided with passages for the material inclined abruptly to the axis of the container, said passages merging into orifices having their longitudinal axes substantially parallel to the axis of the container, means for extruding the material from the container through said passages, a cutter adjacent the orifices, and means for producing relative movement between the cutter and bottom for cutting the extruded bars into portions, substantially as described.

15. In a portioning machine, a container for the material to be portioned, said container having an annular discharge opening

of materially different diameter than the diameter of the container, means for extruding material from the container through said opening, and means for severing the extruded material.

16. In a portioning machine, a container for the material to be portioned, said container having an annular discharge opening of materially different diameter than the diameter of the container, means for extruding material from the container through said opening, and means for severing the extruded material, said means comprising a cutter adjacent said opening said cutter and container being relatively movable.

17. In a portioning machine, a container for the material to be portioned, said container having an annular discharge opening of materially different diameter than the diameter of the container, and provided with a plurality of individual outlet passages.

18. In a portioning machine, a container for the material to be portioned, said container having an annular discharge opening of materially different diameter than the diameter of the container, and provided with a plurality of substantially spaced rectangular outlet passages.

19. In a portioning machine, a container, a bottom for said container having an extrusion opening, a support for said bottom, means for adjusting said support to withdraw the bottom, and means detachably securing the support and bottom.

20. In a portioning machine, a container, a bottom for said container having an extrusion opening, a support for said bottom, means for adjusting said support to withdraw the bottom and container, means limiting the withdrawal movement of container, and means detachably securing the support and bottom.

21. In a portioning machine, a container for the material to be portioned, said container having an annular discharge opening of materially different diameter than the container, means for extruding material from the container through said opening, and means for severing the extruded material, said means comprising a cutter adjacent said opening and adjustable relatively to said container.

In testimony whereof I have hereunto set my hand.

LUTHER L. KNOX.