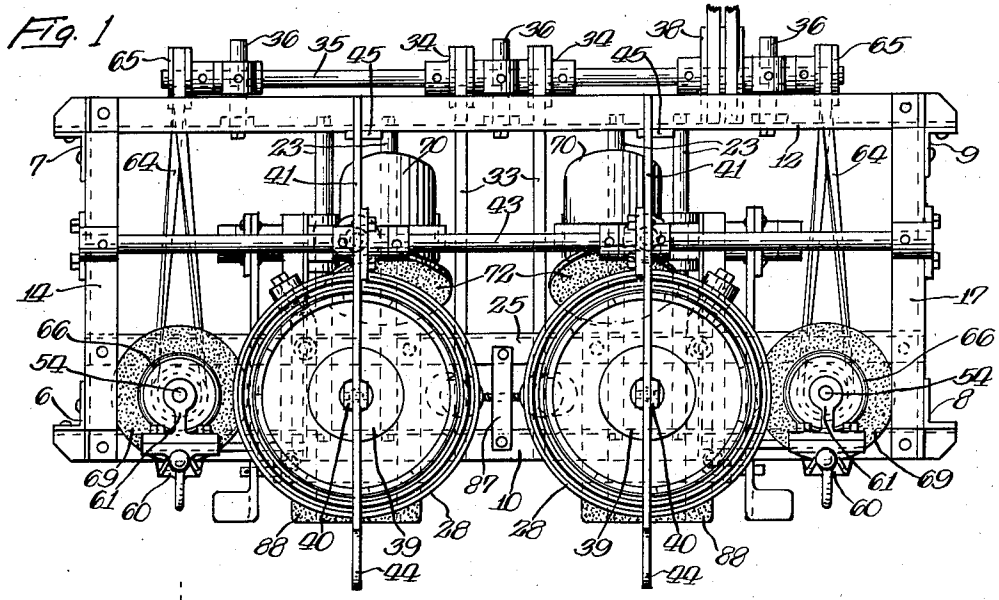
June 6, 1939. A. M. WALSTROM 2,161,115

MACHINE FOR MAKING TUBS AND THE LIKE

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Fig. 1



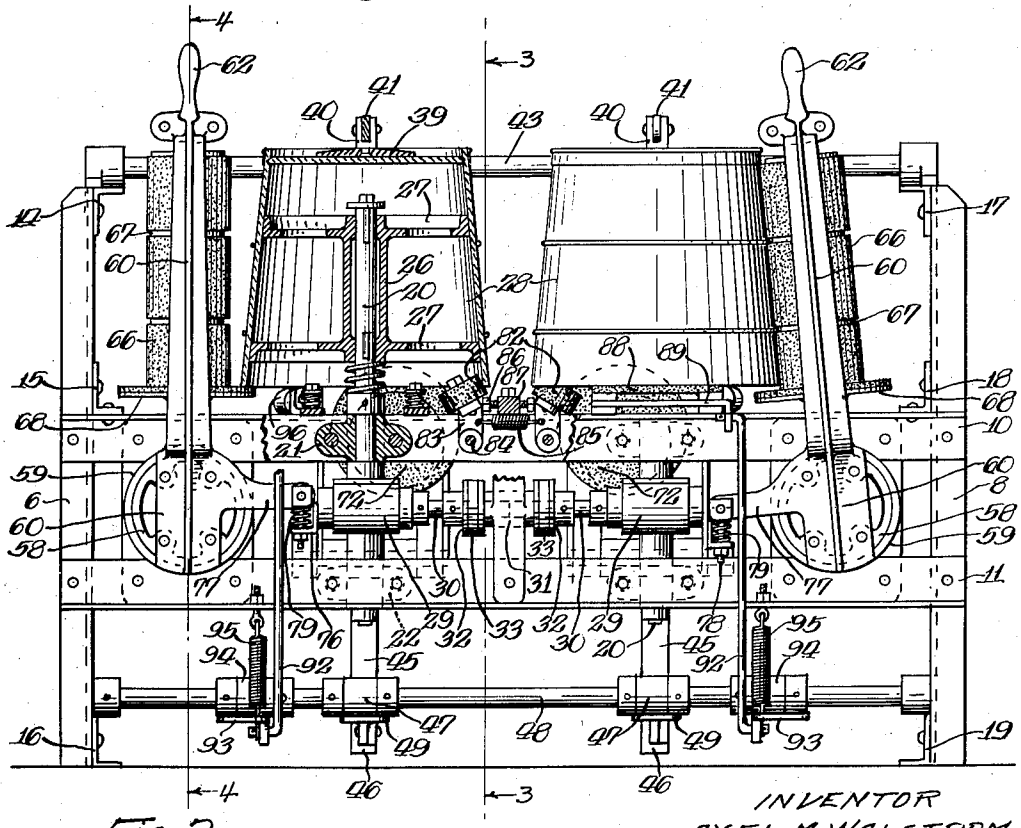


Fig. 2

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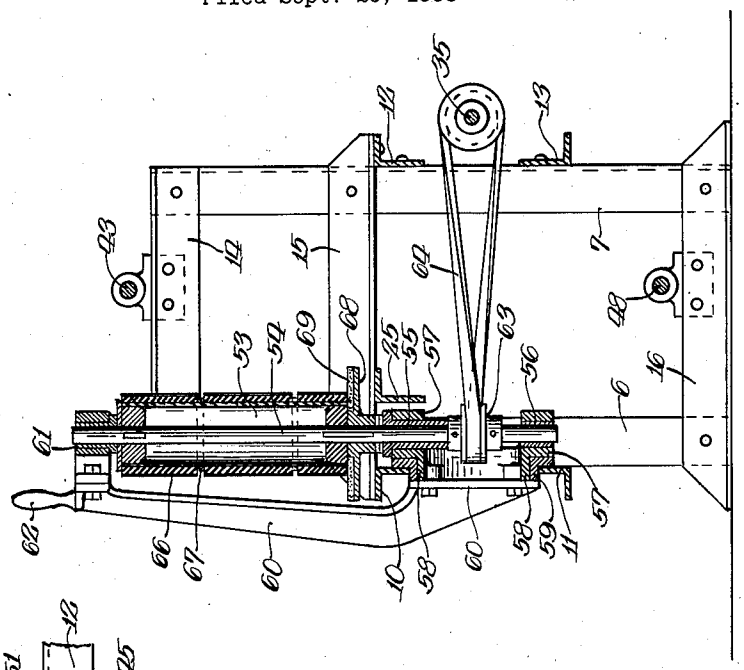


Fig. 4

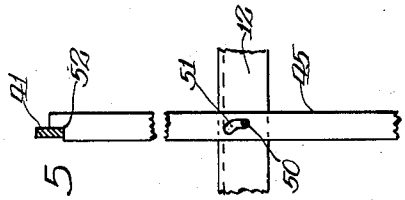


Fig. 5

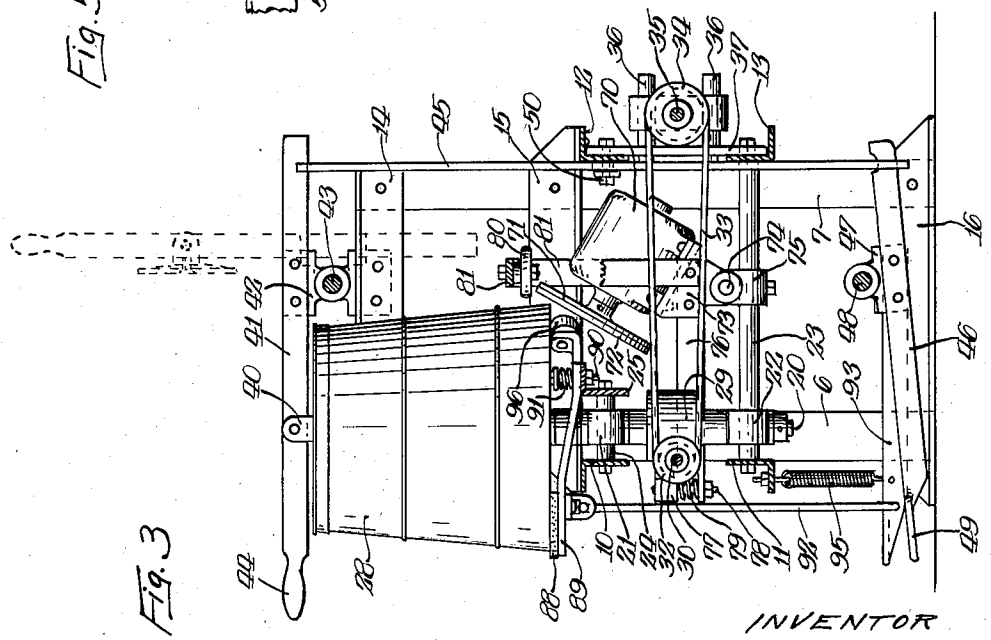


Fig. 3

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UNITED STATES PATENT OFFICE

2,161,115

MACHINE FOR MAKING TUBS AND THE LIKE

Axel M. Walstrom, Minneapolis, Minn., assignor to The Creamery Package Mfg. Company, Chicago, Ill., a corporation of Illinois

Application September 29, 1938, Serial No. 232,296

6 Claims. (Cl. 51—3)

The invention relates to machinery for the manufacture of tubs and like containers of wooden stave construction, and more particularly to a machine for finish sanding the outer surface and open end of an assembled tub.

In the coopering of butter tubs and similar containers, it is common practice to sand the outer surfaces of the assembled staves as an intermediate operation in the assembly of the tubs, and subsequently by separate operation to finish uniformly the ends of the staves forming the top of the tub.

It is the principal object of this invention to provide a machine which will quickly and conveniently finish in one operation both the outer surface of the tub and the end portions of the staves as a final operation after complete assembly of the tub.

Other objects and advantages will be apparent in the following detailed description of a preferred embodiment of the invention which I have selected for illustration in the accompanying drawings. It will be understood, however, that various changes in form, construction and arrangement may be made by those skilled in the art without departing from the spirit and scope of the invention as expressed in the appended claims.

Referring to the drawings, Fig. 1 represents a plan view of the machine. Fig. 2 is a front view in elevation with one of the units shown in partial section taken on a vertical plane. Fig. 3 is a side view in elevation of one unit as viewed from the plane of the line 3—3 of Fig. 2. Fig. 4 is a side view in sectional elevation taken on the plane of the line 4—4 in Fig. 2. Fig. 5 is a view in elevation of one of the detailed parts of the mechanism.

As herein illustrated, the machine comprises two similar units conveniently arranged for operation by one attendant, but the machine may be constructed if desired with but one unit. Generally stated, each of the similar units comprises a slow speed rotary spindle carrying a spool which is shaped to support an inverted completely assembled butter tub. Positioned laterally of the spool is a high-speed rotary abrasive cylinder supported on a swinging frame by which the cylinder may be manually moved into contact with the outer surface of a tub secured on the spool. The sanding cylinder is provided with an abrasive plate which contacts the lower ends of the inverted tub staves and finishes the end of the tub. Rearwardly of the spool is a rotary abrasive plate positioned at an angle to the end of the tub and mounted with its driving motor on a tiltable support, the latter being controlled so that the plate may be swung into limited contact with the ends of the staves and remove the sharp outer edge. The inner edge of the stave ends is also smoothed by means of an abrasive member positioned to contact that edge as the tub revolves on its spindle. The further finishing of the ends of the staves is accomplished by an abrasive plate upon which the end of the inverted tub rests when positioned on the spool, this plate having a finer abrasive than that carried by the plate which is part of the sanding cylinder. A device is also provided for forcing the tub upwardly from the supporting spool at the end of the operation.

More specifically described, with reference to drawings, the operating parts of the machine are mounted upon a frame structure comprising four upright corner standards 6, 7, 8 and 9, carrying two front longitudinal members 10 and 11, a pair of rear longitudinal members 12 and 13, and end cross members 14 to 19. For convenience in description, like reference numerals will be applied to the same parts in the two similar units and the description will be stated as to one of the units.

An upright spindle 20 is mounted in appropriate bearing blocks 21 and 22, the lower one 22 being supported on a pair of cross bars 23 secured to the longitudinal frame members 11 and 13, the upper one 21 being supported on a pair of short cross bars 24 secured to the upper front frame member 10 and an intermediate longitudinal frame member 25. The vertical spindle 20 extends above the upper bearing 21 and has secured thereto a tub supporting spool 26 having a pair of spaced annular flanges 27 of which the outer peripheries are formed to receive and support an inverted assembled tub indicated at 28.

The spindle 20 is operated by means of a conventional worm gear drive unit 29, mounted between the bearings 21 and 22, and in which the spindle 20 is the gear shaft. The worm shaft 30 extends into an outer bearing 31 mounted on the frame structure, and carries a pulley 32 connected by a belt 33 extending rearwardly to another pulley 34 mounted on a shaft 35 outwardly supported in suitable bearings mounted on pairs of short bars 36 secured to plates 37 fastened to the rear frame members 12 and 13. The shaft 30 carries a drive pulley 38 having belt connection with a prime mover not shown herein.

The tub 28 is secured in position upon the spool flanges 27 by means of a pressure disc 39 con-

tacting the bottom of the inverted tub and rotatably mounted on a support 40 of which the axis is coincident with the axis of the spool supporting spindle 20. The support 40 is carried upon a swinging bar 41 secured to a bracket 42 rotatably mounted on a stationary shaft 43 secured in suitable brackets mounted on the end frame members 14 and 17. The bar 41 terminates in a handle 44 by which the pressure disc may be manually moved into contact with the tub bottom.

When the bar 41 is in operating position, with disc 39 in contact with the tub bottom, pressure thereupon to secure the tub upon the spool is maintained by engagement with a vertical bar 45 extending downwardly and having pivotal connection with a pivoted lever 46 mounted on a bracket 47 having rotatable bearing on a stationary shaft 48 suitably secured in the lower end members 16 and 19 of the frame structure. The forward end of the lever 46 is provided with a foot pedal 49 convenient to the operator of the machine. The vertical bar 45 is intermediately supported by a bolt 50 secured in the rear frame member 12 and extending through a curved slot 51 (Fig. 5) formed in the bar.

The upper end of the vertical bar 45 has a notch 52 to receive the extended rear end of the handle bar 41 carrying the tub bottom engaging pressure disc 39. In operation, the attendant moves the handle bar 41 down into horizontal position to secure the tub upon the spool flanges 27, and then by operation of the pedal bar 46 the vertical bar 45 is moved upwardly and at the same time given lateral movement by the curved slot 51, causing engagement of the notch at the upper end of the bar with the extended rear end of the handle bar. Upon release of the pedal bar the vertical bar drops and moves laterally in reverse direction into position free of the handle bar when the latter is lifted to release the tub.

Positioned laterally of the tub supporting spool 26 is a rotary cylinder 53 (Fig. 4) adapted to carry abrasive material. The cylinder 53 is secured upon a high-speed spindle 54 supported at its lower end in a pair of spaced bearings 55 and 56 provided in a swingable bracket 57 having a forwardly extending annular supporting flange 58 extending through and rotatably supported upon a plate 59 secured to the frame members 10 and 11. Secured to the annular portion 58 of the bearing bracket, and overlying the plate 59, is the base portion of an arm 60 extending upwardly and carrying at its upper end an upper bearing 61 provided for the spindle 54. The extreme upper end of the arm 60 is provided with a handle 62 for manual control of the swinging movement of the cylinder 53 and its supporting spindle.

The abrasive cylinder supporting spindle 54 is driven by means of a pulley 63 secured to the spindle between the two lower bearings in the bearing bracket 57. The pulley 63 is connected by a belt 64 with a driving pulley 65 mounted on the shaft 35. The abrasive material is mounted on the cylinder 53 in three cushioned sections or bands 66 spaced by open grooves 67. At the lower end of the assembled abrasive sections is a circular plate 68 secured to the spindle 54 and upon which is mounted a renewable disc 69 of abrasive material. The disc 69 is positioned to extend beneath and in contact with the lower ends of the staves in the inverted tub mounted on the spool flanges 27, when the arm 60 is in upright position. Movement of the arm 60 laterally toward the tub carries the rapidly rotating abrasive bands 66 into contact with the revolving surface of the tub, the grooves 67 registering with the hoops mounted on the tub and permitting effective contact with the surface of the staves.

Positioned rearwardly of the tub supporting spool is an electric motor 70 carrying on its armature shaft a circular plate 71 which is adapted for securing to its front face an abrasive disc 72. The motor 70 is tilted so that the disc 72 is in angular relation to the lower end of the inverted tub. The motor is mounted upon a swingable inclined bracket 73 (Fig. 3) supported upon a rock shaft 74 having its bearings 75 mounted on the cross bars 23.

The motor bracket 73 has secured thereto a forwardly extending bar 76 of which the end extends adjacent to a laterally extending arm 77 formed on the base portion of the cylinder supporting arm 60. The bar 76 and the lateral arm 77 are interconnected by means of a bolt 78 loosely secured to the bar and the arm and supporting between the two a compression spring 79. Swinging the supporting arm 60 to move the abrasive bands 66 into contact with the outer surface of the tub staves, effects through the bar 76 the forward tipping of the motor supporting bracket 73, and moves the abrasive disc 72 into finishing contact with the outer corner edge of the lower ends of the staves of the inverted tub. The forward movement of the abrasive disc 72 is limited by means of a roller 80 contacting the lateral surface of the tub, the roller 80 being rotatably supported upon a U shaped bracket 81 rigidly secured to the motor bracket 73. The spring 79 permits swinging the arm 60 sufficiently to maintain full contact by the abrasive bands 66 with the side of the tub, by compression of the spring after the limit of movement of the arm 76 has been reached through contact of the roller 80 with the side of the tub.

Finishing of the inner angular edge of the stave ends in the inverted tub is accomplished by an abrasive member 82 (Fig. 2) mounted on a swinging bracket 83 having its bearing on a shaft 84 supported between the frame members 10 and 25. Limited contact with the edge of the tub is provided by means of a spring 85 secured to the bracket 83 at one end, and to a similar bracket in the adjacent unit at the other end, the movement toward the tub end being limited by an adjustable contact bolt 86 mounted in a bar 87 secured on the frame members 10 and 25.

Supported beneath the front side of the revolving tub is a horizontal abrasive plate 88 mounted on a rocker bar 89 having resilient hinged support on the longitudinal frame member 25 by means of a bolt 90 extending loosely through the bar and frame member and carrying at its upper end a compression spring 91 bearing upon the bar.

The abrasive plate 88 is controlled in its contact with the tub by means of a link 92 pivotally attached to the bar 89 and extending downward into pivotal attachment with a pedal lever 93 having rearward support on a bracket 94 rotatably mounted on the stationary shaft 48. The plate 88 is normally maintained in contact with the end of the tub by means of a spring 95 secured to the frame member 11 and to the pedal lever 93 and tending to lift the latter to hold the plate 88 in contact with the tub end. The rocker bar 89 extends rearwardly of its support and

carries a roller **96** mounted in position to contact the lower end of the tub by depression of the pedal **93**, thereby forcing the tub upwardly and free of its supporting spool when the finishing operations have been completed.

I claim as my invention:

1. Apparatus of the class described comprising in combination, means for supporting and rotating a container of hoop bound stave construction, rotary abrasive means for finishing the outer surface of said container, said abrasive means having a series of spaced cylindrical abrasive bands and an abrasive disc, and a swingable support for said abrasive means, said support in one position causing said disc to contact an end of said container, and in another position causing said bands to contact the side surfaces of said container between said hoops.

2. Apparatus of the class described comprising in combination, means for supporting and rotating a container of stave construction, rotary abrasive means for finishing the outer surface of said container, a swingable support for said abrasive means by which said means may be moved into contact with the side surface of said container, a tiltable rotary abrasive device for finishing an end edge of said container, and operative connecting means between said support and said tiltable device whereby the movement of said support to cause said abrasive means to contact the side surface of said container also causes said tiltable device to contact the end edge of said container.

3. Apparatus of the class described comprising in combination, means for supporting and rotating a container of stave construction, rotary abrasive means for finishing the outer surface of said container, said abrasive means having a cylindrical abrasive band and an abrasive disc, a swingable support for said abrasive means, said support in one position causing said disc to contact the end of said container and in another position causing said band to contact the side surface of said container, an abrasive plate positioned to contact the end of said container, and a support for said plate having resilient means tending to maintain contact between said plate and said container end.

4. Apparatus of the class described comprising in combination, means for inwardly supporting and rotating an inverted container of stave construction, a hand lever, rotary means mounted on said lever adapted by movement of said lever to contact the bottom of said inverted container and retain same upon said support, releasable means for maintaining said lever in container retaining position, a pivoted bar, and a roller mounted on said bar and positioned adjacent the end of said container, said roller being movable by said bar to engage said container and dislodge same from said support.

5. In apparatus of the class described, in combination, means for supporting and rotating a container of stave construction, rotary abrasive means for finishing the outer surface of said container, a swingable support for said abrasive means, said support having a lateral arm, a rotary abrasive device for finishing an end edge of said container, a tiltable support for said device, said tiltable support having a lateral arm, and resilient means operatively connecting said arms whereby the movement of said swingable support causes simultaneous engagement by said abrasive means and said device with said container.

6. In apparatus of the class described, in combination, means for supporting and rotating a container of stave construction, an intermediately pivoted bar, abrasive means mounted on one end of said bar for finishing an end of said container, a roller mounted on the other end of said bar adjacent the end of said container, and operating means attached to said bar, said operating means normally causing engagement by said abrasive means with said container and being operable to withdraw said abrasive means and cause engagement of said roller with said container to dislodge said container from said support.

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