

Feb. 27, 1934.

E. F. OYSTER

1,948,799

AIR OPERATED CLAMP

Filed Nov. 5, 1932

2 Sheets-Sheet 1

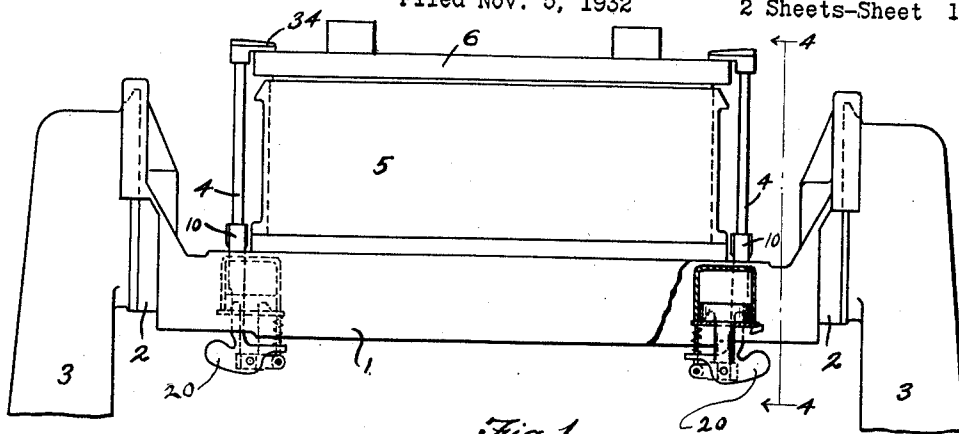


Fig. 1

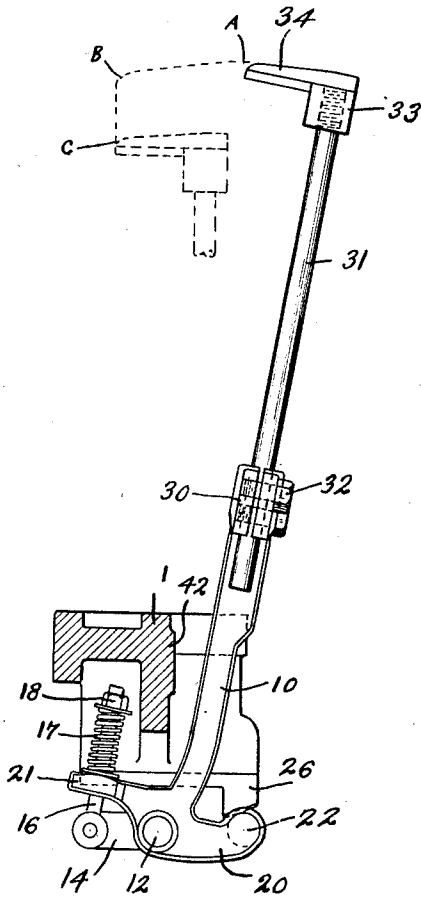


Fig. 2

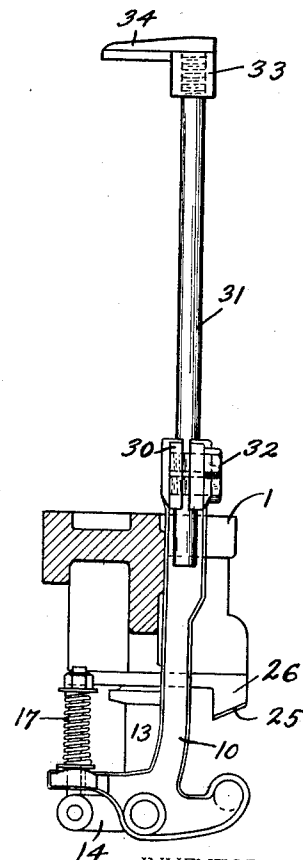


Fig. 3

INVENTOR.

Carl F. Oyster

BY

Ray, Oberlin & Day
ATTORNEYS.

Feb. 27, 1934.

E. F. OYSTER

1,948,799

AIR OPERATED CLAMP

Filed Nov. 5, 1932

2 Sheets-Sheet 2

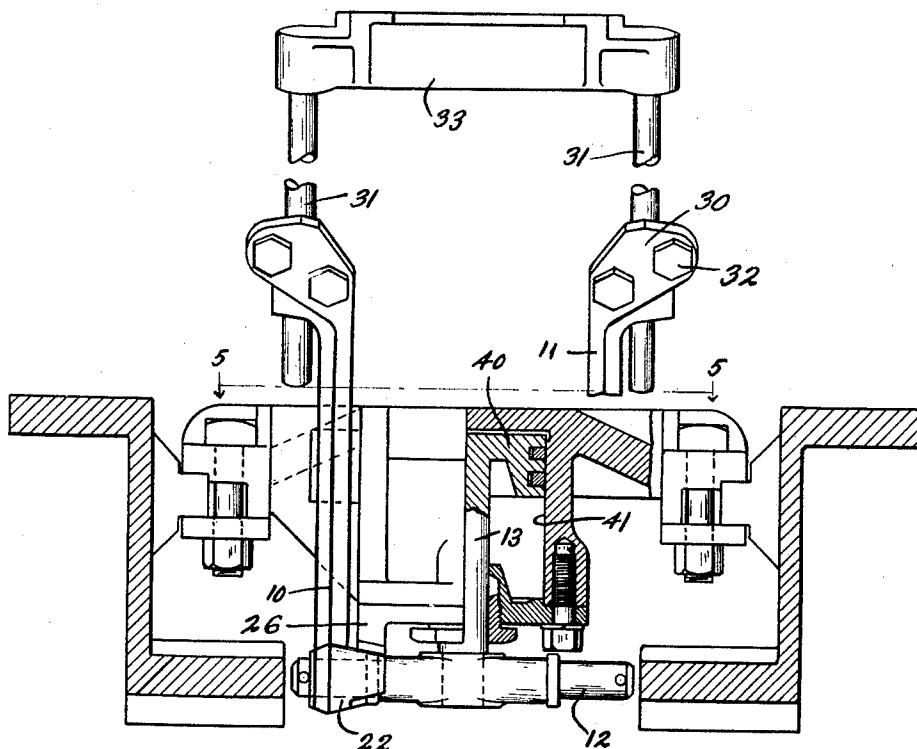


Fig. 4

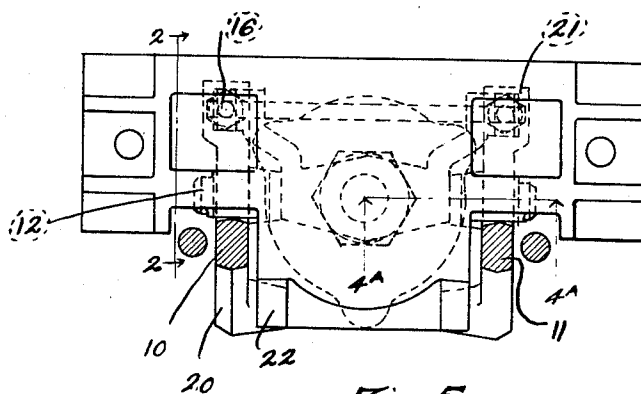


Fig. 5

INVENTOR.

Carl F. Oyster

BY

Fay, Oberlin & Fay
ATTORNEYS

UNITED STATES PATENT OFFICE

1,948,799

AIR OPERATED CLAMP

Earl F. Oyster, Shaker Heights, Ohio, assignor
to The Osborn Manufacturing Company, Cleve-
land, Ohio, a corporation of Ohio

Application November 5, 1932. Serial No. 641,408

2 Claims. (Cl. 22—109)

This invention relates to a clamp for the rollover table of a molding machine and has for its purpose the provision of a power operated clamp in place of the hand operated clamp previously used. Among the purposes of the invention are the provision of a clamp which lessens the amount of manual work on the part of the operator, which is rugged and simple in construction, cheap to manufacture and install, readily fastened and released, quick and reliable in operation, readily adjustable to various flask sizes, having a long stroke so as to take some range of flask sizes without adjustment, capable of applying considerable pressure to the bottom board to minimize loss of sand. To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings:

In the drawings Fig. 1 is a side elevation showing the rollover table of a standard type molding machine fitted with my improved clamps, the clamps being shown holding a flask in position before rolling over; Fig. 2 is a side view of the clamp on a larger scale, showing the clamp in released position and taken approximately on the line 2—2 of Fig. 5; Fig. 3 is a view similar to Fig. 2, but in the clamping position; Fig. 4 is an end view, partly in elevation and partly in section, taken approximately on the line 4—4 of Fig. 1, but with a portion of the section taken approximately on the line 4A—4A of Fig. 5; and Fig. 5 is a plan view taken generally on the line 5—5 of Fig. 4.

Referring now to the drawings, Fig. 1 shows a rollover table 1 revoluble about vertical trunnions 2, 2 at the upper ends of the usual supporting posts 3, 3, all of these being standard constructions in jolt squeeze molding machines. The jolting and squeezing mechanism being well understood, is omitted. Clamping mechanisms 4, 4 hold a flask 5 in position against the rollover table 1, the immediate engagement of the clamps being with a bottom board 6 of conventional type. Since the showing of Fig. 1 is prior to the squeezing, the bottom board 6 is held by

the sand which stands slightly above the edge of the flask 5.

The clamps at the two ends are duplicates, facing inward. The clamp on the right end of the rollover table is shown in Figs. 2 and 3 and will be taken as the basis of the detailed description. Each clamp comprises two arms 10 and 11 oscillatable upon opposite ends of a transverse rod 12, which in turn is carried upon the lower end of a piston rod 13, and immovable with respect thereto. Thus the rod 12 is carried vertically up and down by the movement of the piston rod and always remains parallel but transverse to the table 1. A short arm 14 projects at right angles to the rod 12, inward with respect to the rollover table and has horizontally pivoted to its inner end a rod 16, which may conveniently be an eye-bolt movable through a limited arc but always substantially upright. This eye-bolt carries a coiled spring 17 between a nut 18 and the end of an arm 21, referred to below, this arm 21 being an integral part of, or at any rate rigid with relation to the arm 10. At its bearing upon the rod 12, the arm 10 has two shorter approximately horizontal arms 20 and 21, the arm 21 being flat and open for the passage of the eye-bolt 16, while the other arm 20, carries a roller 22 which engages the diagonal face 25 of a stop 26 secured to the under side of the table 1. At its upper end, the arm 10 is split into two opposed jaws as at 30 to receive the lower end of a rod 31 which may be adjusted up and down in the jaws 30 and clamped by setting up on bolts 32. This pair of rods 31 carries a transverse yoke 33, having an inward flange 34 which fits, as shown in Fig. 1, over the edge of the bottom board 6.

This piston mechanism is best shown in Fig. 4 and at the right of Fig. 1, comprising a piston 40 movable in a cylinder 41 which is air-tight at either end, so that the piston can be moved in either direction by air pressure. The piston rod 13, already mentioned, is centrally located.

In operation, assuming air pressure to be beneath the piston 40, Fig. 4, the mechanism will be in the unclamped position of Fig. 2, the piston is in its upper position, Fig. 4, and the engagement of the roller 26 with the face 25 tilts the arm 10 as shown so that the yoke 33 and flange 34 are out of contact with and out of line with the edge of the bottom board 6.

At the beginning of work the rollover table 1 will be upright, as in Fig. 1, but the clamps will be in the position of Fig. 2. The operator places

an empty flask such as 5 on the table, fills it, jolts it, and strikes off the sand, all by mechanism well known in the art and forming no part of the present invention. He then places in position the bottom board 6, which will be held with its rim a little removed from the top edge of the flask 5 because the sand has not yet been squeezed, and admits air to the clamp pistons, thus applying the clamps as shown in Figs. 1 and 3. The flask is now rolled over and squeezed, the squeeze mechanism being also well known and consequently not shown in the present application. Squeezing will close the bottom board tight against the flask 5 but the clamps will retain their hold because the pistons 40 have not yet reached the limit of their movement and thus can travel further to maintain clamping pressure. To release the clamps preliminary to drawing, the clamping air pressure is released and air is admitted on the opposite side of the piston, thus moving the piston toward the surface of the rollover table, to the position of Fig. 4, which accordingly moves the clamps to the position of Fig. 2.

It will be noted that both in the clamping and unclamping action the movement by which the bottom board is engaged and disengaged is perpendicular to the plane of the table, as at B—C, Fig. 2, and it is not until the flange 34 has cleared the edge of the bottom board that the swinging movement occurs. Thus there is no scraping or wearing away of the edges of the bottom board and these always remain flat to receive the pressure of the flanges 34.

To apply the clamps, air is released from below the piston 40 and applied above it thus moving the clamp mechanism down to the position of Fig. 3 as the piston rod 13 protrudes its full length from the cylinder. The roller 22 being released from contact with the stop 26, the spring 17 extends itself and moves the arm 10 to the position of Fig. 3, in which position it is stopped by contact with the pad 42 on one of the side surfaces of the table 1.

This movement is completed during the early part of the stroke, thus moving the flange 34 along the dotted path A—B, Fig. 2 and into line with the edge of the bottom board 6, although still extended, at the point B, out of contact therewith. The continuation of the downward movement of the piston carries the flange 34 along the path B—C, into engaging position. The length of the rods 31 will be so adjusted at the jaws 30 that the flange 34 engages against the bottom board before the piston 41 reaches the bottom of its stroke, so that the clamps always hold the board 6 in place by compressed air pressure, thus

insuring a tight and secure holding of the bottom board and flask during the rolling over.

The clamps being set, the table 1, Fig. 1, is rolled and the rest of the operation proceeds in the usual manner.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:

1. In a molding machine having a rollover table, a cylinder, supporting means for the same beneath said table, a piston therein and a piston rod extending through the end of the cylinder remote from said table and beyond the cylinder supporting means, a pivot mounting carried by said rod beyond the cylinder supporting means, an arm in the plane of said pivots extending at right angles to said pivots, said rod being movable perpendicularly to the plane of said table, a pair of clamp arms carried by said pivot mounting disposed adjacent said table, clamping flanges carried by said arms, oppositely directed fixed crank arms at the mounting end of said clamp arms, a spring supported by the pivot-plane arm and acting on one of said crank arms on the same side to tilt the clamp arms in one direction, and a cam on the cylinder mounting adapted for acting on the other of said crank arms to tilt the clamp arms in the opposite direction.

2. A rollover clamp comprising a pair of arms disposed on opposite sides of a rollover table, a pivot mounting carrying said arms, a cylinder, supporting means for the same beneath said table, a piston therein and a piston rod extending through the end of the cylinder remote from said table and beyond the cylinder supporting means, said piston rod carrying said pivot mounting beyond said cylinder supporting means and being movable at right angles to the plane of the table, means for adjusting the length of said arms, fixed crank arms extending in opposite directions at the mounting end of said arms, other arms carried by the piston rod in the plane of said pivots and at right angles thereto, springs cooperating with one each of said piston-rod-carried arms and one of said crank arms to tilt the clamps in one direction when moved away from said table and a stop on the cylinder supporting means cooperating with the other of said fixed crank arms to oscillate the clamp in the other direction when moving toward said table.

EARL F. OYSTER.