April 9, 1940. H. T. H. ANDRESEN 2,196,619

MACHINE FOR MAKING CLOSURES

Filed June 6, 1938

Fig. 1.

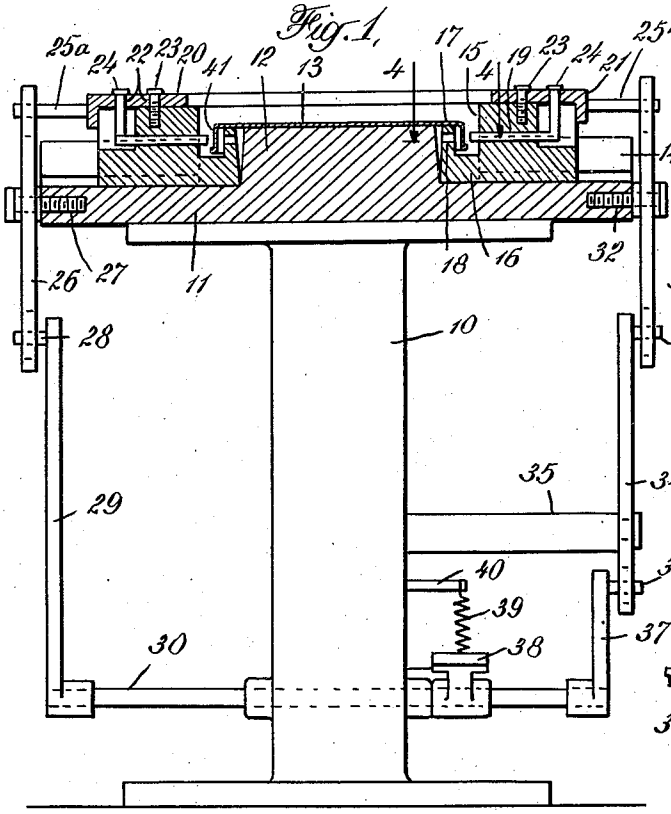


Fig. 3.

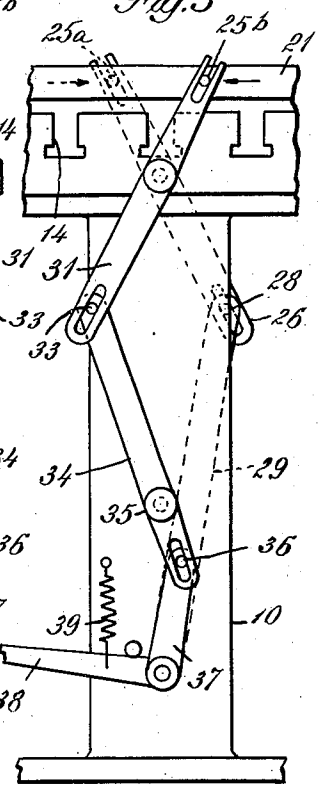


Fig. 2.

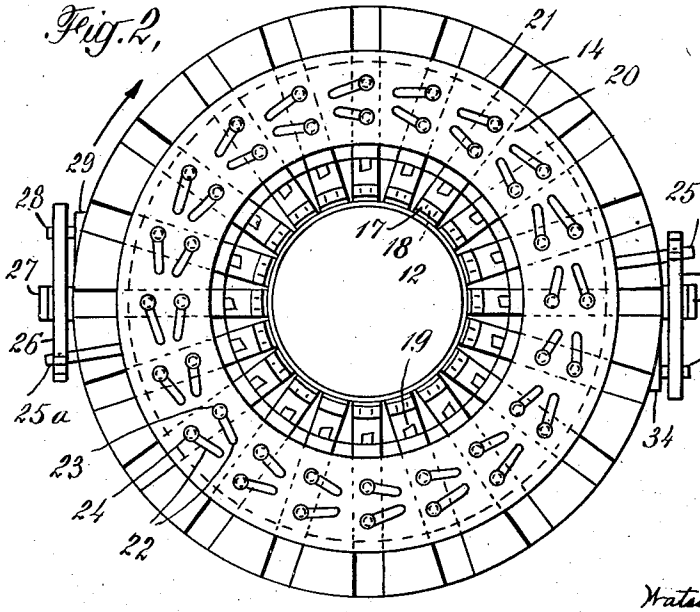


Fig. 4.

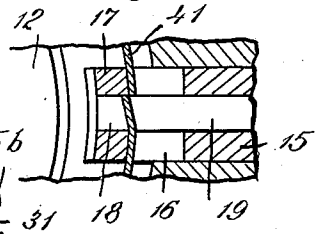
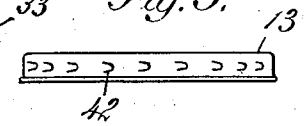


Fig. 5.



INVENTOR
Halvor J. H. Andresen
BY
Watson, Cole, Grindle & Watson
ATTORNEYS

Patented Apr. 9, 1940 2,196,619

UNITED STATES PATENT OFFICE

2,196,619

MACHINE FOR MAKING CLOSURES

Halvor Tobias Heyerdahl Andresen, Oslo, Norway

Application June 6, 1938, Serial No. 212,205

3 Claims. (Cl. 153—2)

This invention relates to metal working machines and is concerned more particularly with a novel machine for striking tongues from the wall of a hollow body. The machine of the invention may be employed in the production of articles for various purposes, but since it is especially adapted for use in making connecting devices of the type disclosed in my copending application Serial No. 212,204 filed June 6, 1938, an embodiment of the invention for producing such devices will be illustrated and described in detail for purposes of explanation.

The device of the copending application is intended for connecting together two objects, such, for example, as a vessel and its cover, and one element of the device is a sleeve provided with a plurality of tongues extending generally circumferentially of the sleeve with their bases extending generally axially thereof. The sleeve is connected to the cover and engages a part of the vessel to hold the cover in place, and in one form of construction, the sleeve is formed as a part of the cover. The vessel is provided with a flange surrounding its opening and when the cover is in place, it is seated either directly on the flange or on packing on the flange, and the tongues on the sleeve engage the under side of the flange and hold the parts securely together.

The machine of the present invention may be used in the formation of the tongues on the sleeve of the connecting device of the copending application, regardless of whether or not the sleeve is integral with the main portion of the cover or separate therefrom. The new machine, accordingly, includes a support for the sleeve blank and a plurality of dies disposed around the support and lying within the sleeve. Outside the sleeve are punches, one for each die, and means are provided for moving the dies and punches toward and away from each other so that in the approaching movement of the parts, the punches strike tongues from the sleeve and force the tongues into openings in the dies. Thereafter, during their relative movement of separation, the dies and punches clear the blank and tongues, so that the blank may be readily removed from the support.

For a better understanding of the invention, reference is made to the accompanying drawing in which

Fig. 1 is a view partly in elevation and partly in vertical section through the machine of the invention;

Fig. 2 is a plan view of the machine shown in Fig. 1;

Fig. 3 is a fragmentary side elevation of the machine;

Fig. 4 is a sectional view on the line 4—4 of Fig. 1, and

Fig. 5 is a view in side elevation of a container cover which has been provided with tongues by the machine.

Referring to the drawing, the machine illustrated includes a pedestal 10 at the top of which is a block 11 having a shape corresponding to the section of the blank to be operated on. In the machine illustrated, the block is circular since the machine is intended for operating on sleeves of cylindrical section. The block is provided with a central boss 12 which serves as a support for the blank 13 to be acted upon, and extending radially from the boss are guideways 14 formed in the top of block 11. Within each guideway is a movable block 15 provided at its inner end with an extension 16, at the free end of which is a die 17 having an opening 18 therethrough. A punch 19 is mounted in the main portion of the block in alignment with the opening 18, and the end of the punch adjacent the die is cut off at an angle to the axis of the punch, as illustrated in Fig. 4.

Resting on the upper surfaces of the blocks 15 is an annular plate 20 provided with a depending peripheral flange 21 which lies outside the outer faces of the blocks, and the plate 20 is provided with a plurality of pairs of cam slots 22, one pair for each block 15 and the punch 19 mounted therein. Each block 15 is provided with a pin 23 extending upward through an inner slot 22 and each punch carries a pin 24 at its outer end which passes through an outer slot 22.

The plate 20 is movable angularly in its plane, and for this purpose, a pair of rods 25*a*, 25*b* are connected to the plate 20 at diametrical points. The outer end of the rod 25*a* lies within a slot in a lever 26 pivoted at 27 on the block 11, and the lower end of lever 26 is connected by a slot and pin connection 28 to the end of a crank 29 fast on a shaft 30 mounted in bearings on the pedestal 10. The end of pin 25*b* lies within a slot in the end of a lever 31 pivoted at 32 on the block 11, and at its lower end, the lever is connected by a slot and pin connection 33 to a lever 34 pivotally mounted on an arm 35 extending laterally from the pedestal. The other end of lever 34 is connected by a slot and pin connection 36 to a crank 37 fast on shaft 30. Adjacent one of its bearings, the shaft carries a treadle 38, which is normally maintained in raised position

by a spring 39 connected thereto and to a rod 40 attached to the pedestal 10.

In the starting position, the blocks 15 are at the limit of their inward travel toward the support 12 and the punches 19 are at the limit of their outward travel. A cover blank 13 is then placed upon the support 12 with its depending flange 41 lying between the dies and their associated punches. The treadle is now depressed and this rocks the shaft 30, which acts through the levers to move the plate in a clockwise direction when viewed from the top. In this movement of the plate, the cam slots 22 therein act on the pins 23, 24 and cause the blocks 15 to move outwardly in their guideways 14, until the dies carried thereby engage the inner surface of the flange 41 on the blank. At the same time, the punches 24 are moved inwardly by the cam action to the position illustrated in Fig. 4, where it will be noted that the inclined end of each punch has pierced the flange 41 to strike a tongue therefrom and force the free end of the tongue inward into the bore 18 of the associated die. When the treadle is released, it is restored to its initial position by the spring 39 and the rocking of the shaft caused thereby acts through the connections to move the plate 20 in a counter-clockwise direction. The blocks 15 are then cammed inwardly toward the support 12 and the punches are moved outwardly. The blank is thus freed from the punches and dies, even though the tongues extend inwardly beyond the inner surface of the flange on the blank. The blank may, accordingly, be freely removed from the machine and, after a new blank is placed in position, the machine is ready for a second operation.

The completed product may be either a tubular sleeve having a plurality of tongues struck therefrom with their free ends forced inwardly beyond the inner surface of the sleeve, or a cap having a depending flange with the tongues formed in the flange. The shape of the tongues depends on the cross-sectional shape of the punches and the openings in the dies, and in the construction shown, the tongues are generally wedge-shaped and extend circumferentially of the sleeve with their bases lying axially of the sleeve.

The guideways 14 in the block 11 are of considerably greater length than the blocks 15 mounted therein and this permits the machine to be used in punching sleeves of different diameters. For each variation in diameter, a different plate 20 is employed, but since the plate merely rests in position, it may be readily removed and replaced by another, so that changing the machine over from one product to another is a simple operation.

I claim:

1. In a metal working machine, the combination of a block having a central support for a blank and a plurality of guideways extending outwardly from the support, a die block movably mounted in each guideway, a punch mounted in each die block, a plate provided with cam slots arranged in pairs and lying offset from the guideways, members attached to each die block and its associated punch, said members entering the cam slots on the plate, and means for moving the plate rotationally to cause each die and its associated punch to move toward and away from each other.

2. In a metal working machine, the combination of a block having a central support for a blank and a plurality of guideways extending outwardly from the support, a die block movably mounted in each guideway, a punch mounted in each die block, a plate provided with cam slots arranged in pairs and resting on the die blocks, members attached to each die block and its associated punch for engagement with the cam slots in the plate, and means for moving the plate back and forth rotationally and thereby causing movements of each punch and its die block in which the die and punch move toward and away from each other.

3. In a metal working machine, the combination of a support for a blank, a die disposed adjacent the support on one side of the blank and attached to a block mounted beneath the blank, a punch mounted in the block on the other side of the blank and in alignment with the die, the die having an opening to receive the end of the punch, and means for moving the block and punch to cause the punch and die to move toward and away from each other and the blank, the end of the punch entering the opening in the die in its movement of approach.

HALVOR T. H. ANDRESEN.