Nov. 7, 1944. A. L. KRONQUEST 2,362,206

ROTARY CAN MARKER

Filed Dec. 7, 1940 4 Sheets-Sheet 1

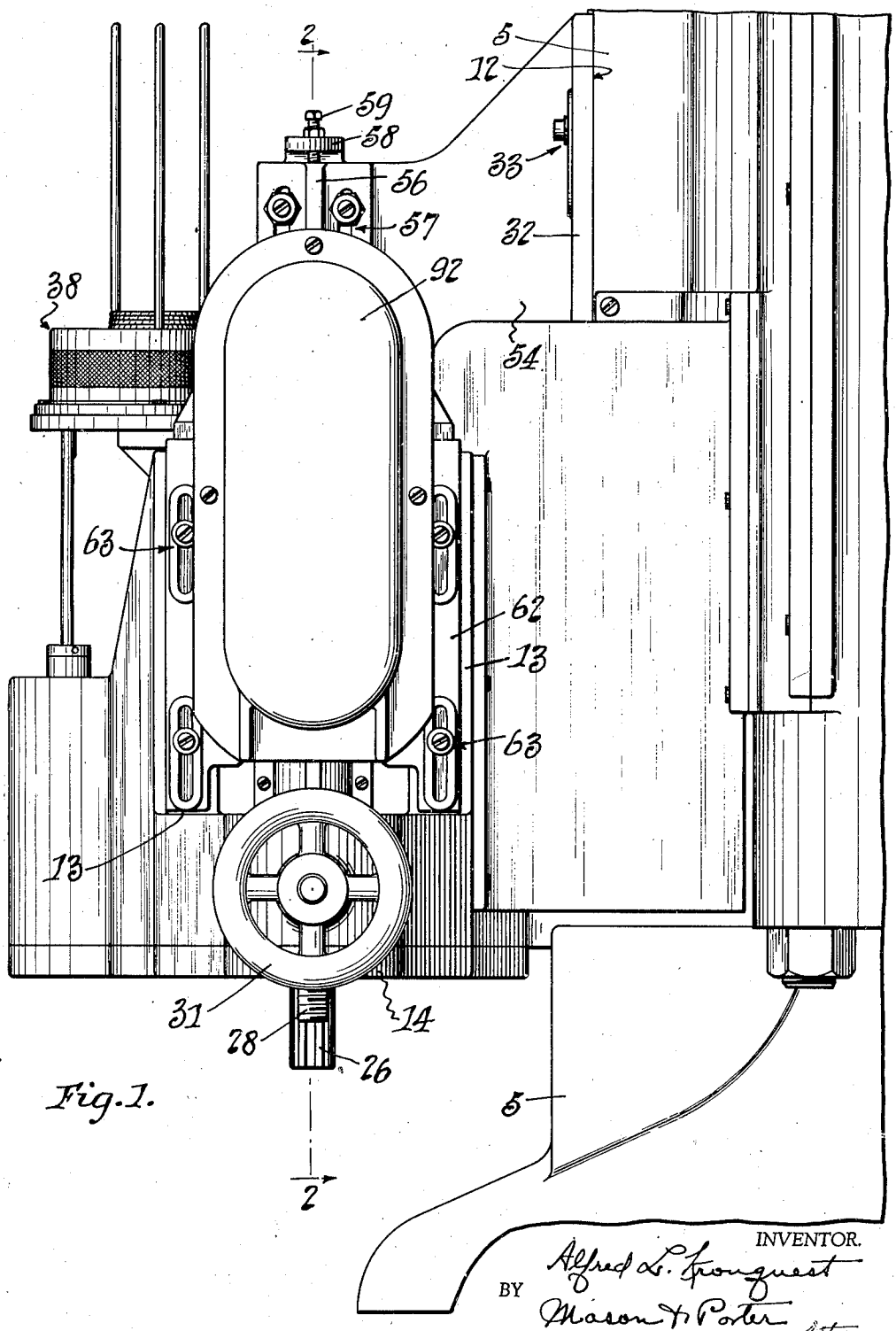


Fig. 1.

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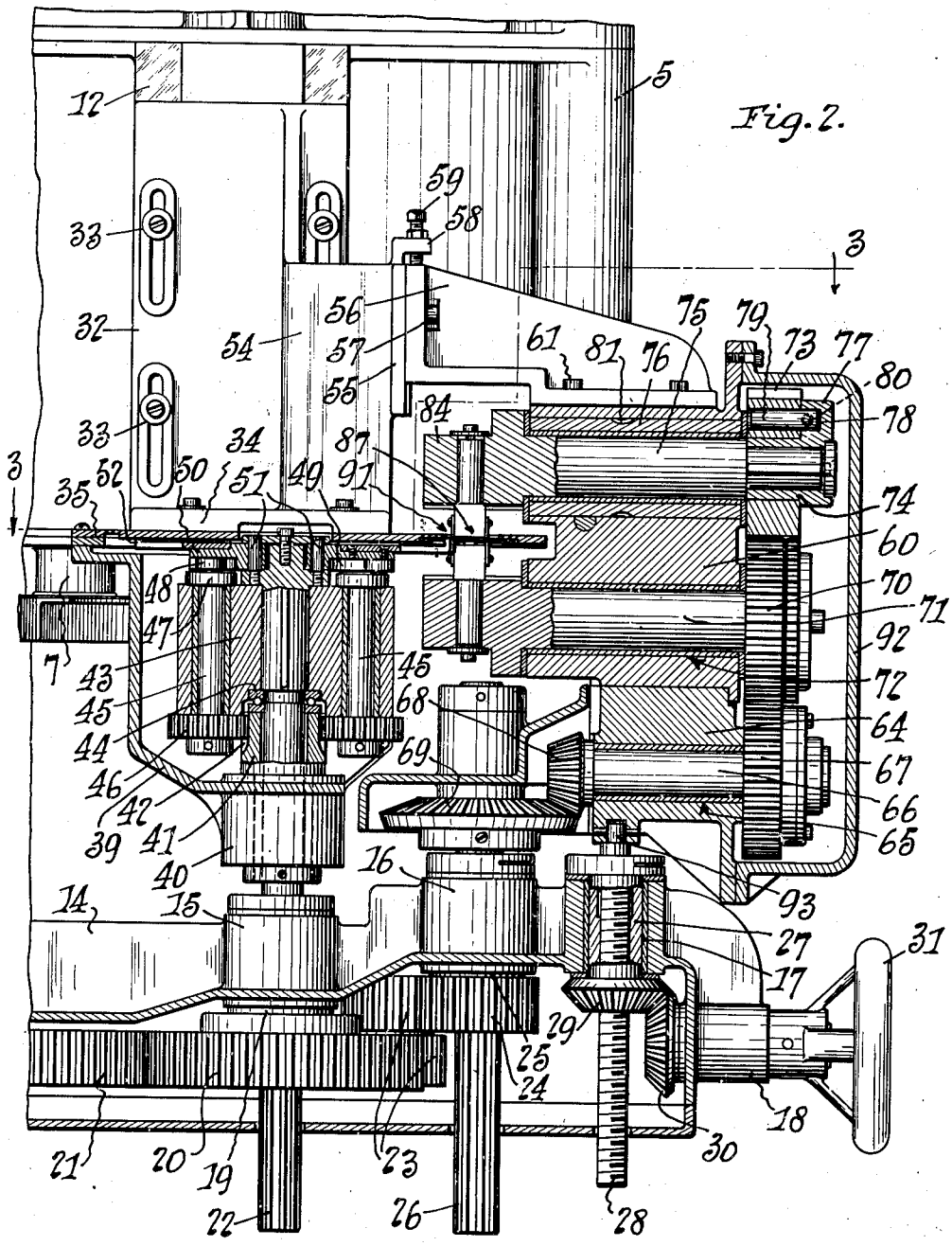


Fig. 2.

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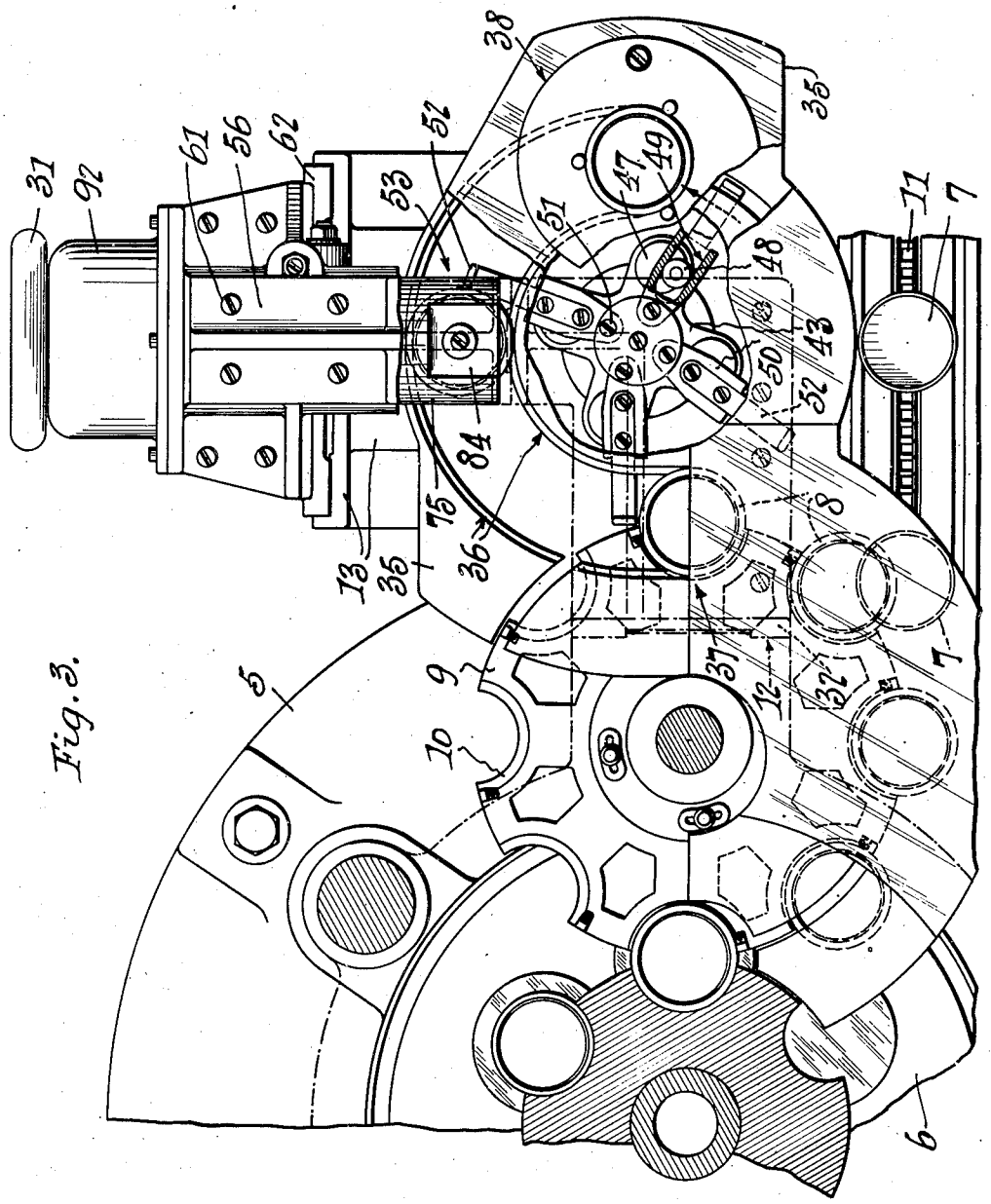


Fig. 3.

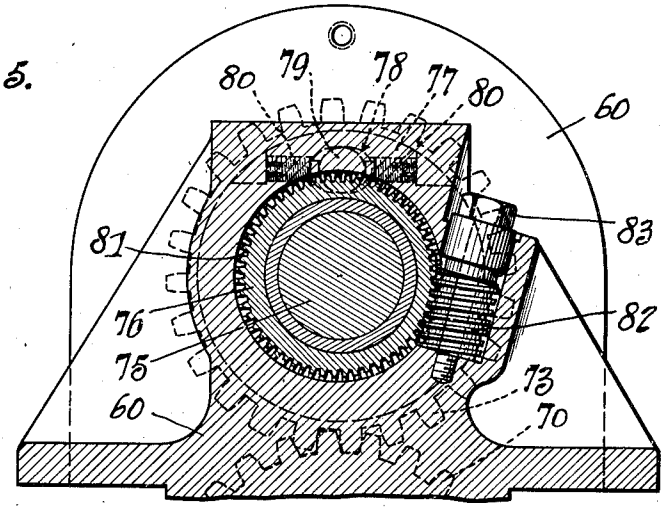
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Fig. 5.



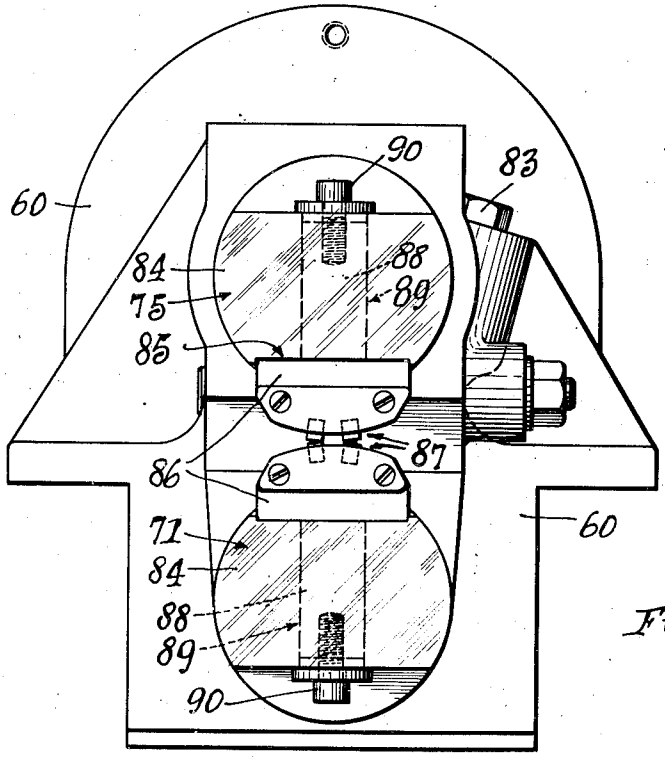


Fig. 4.

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Patented Nov. 7, 1944

2,362,206

UNITED STATES PATENT OFFICE

2,362,206

ROTARY CAN MARKER

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Application December 7, 1940, Serial No. 369,110

5 Claims. (Cl. 101—6)

The invention relates to marking means and primarily seeks to provide a novel and efficiently operable heavy duty marking means capable of embossing suitable identifying markings on can ends or closures as they are being rapidly moved from a supply stack into position for being assembled with cans to be closed in a closing machine.

Marking means employing opposed male and female marking dies engageable with can end closures for applying identifying markings thereon have been provided heretofore, but the use of such means has been attended by disadvantages and problems have been presented by reason of certain limitations upon the speed of use thereof, inability to successfully cope with operation strains incident to heavy duty marking or markings in which more than the customary line or two of embossed letters are included, lack of proper adjustability of the opposed relation of the marking dies, and lack of proper flexibility of mounting of the marking means as a whole so as to enable the marking of end closures for cans of different dimensions. The present invention seeks to provide a novel marking means which will overcome all of these disadvantages and limitations.

An object of the present invention is to provide a marking means of the character stated wherein the marking devices, the end closure supply stack, the end closure feeding means, and the supporting means over which the end closures are fed through the marking devices to the means for effecting end closure and can assembly are adjustable as a unit for adapting the marking means for marking end closures for cans of different dimensions.

Another object of the invention is to provide in apparatus of the character stated closure supply means, closure marking means, travelling supporting means having equidistantly spaced receivers thereon on which to receive marked end closures, and novel closure feeding devices for feeding closures rapidly from the supply means and through the marking means and slowly at the position at which said end closures are deposited on said travelling supporting means.

Another object of the invention is to provide an improved marking means in which the parts are adjustable as a unit for adapting the marking means for use on end closures for different sizes of cans and in which is included means for adjusting certain of the parts relative to each other for properly aligning the end closure feeding and supporting devices with the marking devices.

With the above and other objects in view which will hereinafter appear, the nature of the invention will be more fully understood by following the description, the appended claims and the several views illustrated in the accompanying drawings.

In the drawings:

Figure 1 is a front elevation of the marking means and a part of the closing machine on which said means is adjustably mounted.

Figure 2 is a vertical cross sectional view of the marking means taken substantially on the line 2—2 on Figure 1.

Figure 3 is a horizontal sectional view taken substantially on the line 3—3 on Figure 2.

Figure 4 is an enlarged end elevation illustrating the opposed marking elements and their carrying shafts.

Figure 5 is an enlarged fragmentary vertical cross sectional view through the adjustable mounting of the upper marking element.

The improved container end closure marking mechanism is herein illustrated as vertically-adjustably mounted on a container closing machine which may be of any suitable form including a frame structure generally designated 5 on which is mounted a six station closing turret 6 to which filled containers 7 and end closures 8 therefor are fed by a pocketed feed turret 9. The feed turret 9 includes seats 10 for receiving and positioning the end closures 8 in proper relation above the containers 7 which are fed one by one into the pockets of the turret 9 by any suitable container feed-in means generally designated 11. The end closures are suitably marked while they are being moved from a supply stack toward the receiving seats 10 of the turret 9, and it is the purpose of the present invention to provide a novel marking mechanism particularly adapted to heavy duty marking of end closures with all over markings as distinguished from the usual one or two line marking customarily applied.

The frame 5 includes a mounting pad 12 and a marking means mounting bracket extension 13. The frame also includes a casing and bearing extension 14 equipped with a vertical shaft bearing 15, a vertical shaft bearing 16, a vertical shaft bearing 17, and a horizontal shaft bearing 18.

A sleeve 19 is rotatably mounted in the bearing 15 and carries a gear 20 which meshes with and is driven by a gear 21 to which rotation is

imparted from a moving part of the closing machine. A spline shaft 22 passes vertically through the sleeve 19 thereby being connected for rotation with the sleeve and the gear 20 and also mounted for vertical adjustment relative to said sleeve and gear.

The gear 20 imparts rotation to one of a pair of co-axially mounted idler gears 23 and the other of said idler gears meshes with and imparts rotation to a gear 24 fixed to a sleeve 25 which is rotatably mounted in the vertical bearing 16. A spline shaft 26 is rotatable with and vertically slidable through the sleeve 25 and gear 24, and the purpose of this shaft 26 and the spline shaft 22 and the vertically adjustable nature thereof will later be described.

A sleeve 27 is rotatably mounted in the vertical bearing 17 and has a screw column 28 threadably mounted therein in the manner best illustrated in Figure 2 of the drawings. A bevel gear 29 is fixed to the lower end of the sleeve 27 and meshes with a bevel gear 30 fixed on a shaft rotatable in the horizontal bearing 18 and which is equipped at its outer end with a hand wheel 31. It will be obvious by reference to Figure 2 of the drawings that by rotating the hand wheel 31, vertical movement can be imparted to the screw column 28 upwardly or downwardly through the captive sleeve 27 according to the direction of rotation imparted to said hand wheel.

A bracket plate 32 is vertically-adjustably secured to the mounting pad 12 by slot and screw equipments 33, and this bracket plate includes a flange portion 34 to which is affixed a supporting table or plate 35 which overlies the feed-in turret 9 of the closing machine and is equipped with end closure guideways 36 over which end closures are conveyed from a supply, through the marking station and onto the receiving seats 10 of the turret 9. The marked end closures are delivered onto the receiving seats as at 37. See Figure 3.

The table or supporting plate 35 carries an end closure supply stack or feeding means generally designated 38. This end closure feeding means may be of any approved form capable of discharging end closures one by one onto the receiving guideways 36 beneath the supply or stack. See Figures 1 and 3 of the drawings.

The table or plate 35 also supports a depending housing 39 which is equipped with a bearing 40 vertically aligned with the bearing 15 and which has a sleeve 41 secured therein in the manner best illustrated in Figure 2 of the drawings. The sleeve 41 is of a length for extending vertically above the bearing 40 and has its upper end provided with a rim gear portion 42, the purpose of which will later become apparent.

The spline shaft 22 extends upwardly through the bearing 40 and sleeve 41 and has keyed thereon a rotor 43 supported on anti-friction bearings 44 surmounting the sleeve 41. Four shafts 45 are rotatably mounted in equi-distantly spaced relation in the rotor 43 and each of these shafts carries a gear 46 at its lower end enmeshed with the rim gear portion 42 of the sleeve 41. It will be obvious that as the rotor 43 rotates about the stationary sleeve 41 the rim gear portion 42 of the sleeve will impart rotation to the gears 46 and the shafts 45 on which they are mounted. At its upper end each shaft 45 carries a head 47 equipped with an off-center roller 48, and each roller engages in a radial recess 49 in the under surface of an end closure feeding finger 50 pivotally mounted, as at 51, inwardly of the axis of the associated shaft 45 in the manner best illustrated in Figures 2 and 3 of the drawings. Each of the feeder members 50 is equipped with a feeding finger extension 52 which projects in a generally radial direction to a point centrally disposed between the spaced guides 36 upon which end closures are supported while being moved along by said finger extensions. The marking station through which the end closures are moved by said finger extensions is generally designated 53 in Figure 3 of the drawings.

The bracket plate 32 carries a bracket extension 54 which is equipped with a mounting pad portion 55 against which a bracket hanger 56 is vertically-adjustably secured through the medium of longitudinal slot and screw equipments 57. The extension 54 also includes an overhanging lug 58 and an adjusting screw 59 threaded through the lug in position for engaging the bracket hanger 56 for imparting movements of adjustments thereto relative to the bracket plate 32 and its extension 54, 55.

A marker body 60 is secured as at 61 to depend from the hanger bracket 56 and has mounting pad portions 62 which are vertically-adjustably secured to the bracket extension 13 through the medium of longitudinal slot and screw equipments 63.

The supporting body 60 of the marking mechanism carries a depending extension 64 having a horizontal bearing 65 formed therein for a rotary shaft 66 which carries a spur gear 67 at one end and a bevel gear 68 at its other end.

The bevel gear 68 meshes with and is driven by a bevel gear 69 secured upon the upper end of the vertically-adjustable spline shaft 26.

The spur gear 67 meshes with a spur gear 70 secured upon the lower marker shaft 71 rotatably mounted in the bearing 72 provided therefor in the marker body 60, and the gear 70 in turn meshes with and drives a spur gear 73 which loosely surrounds a sleeve 74 keyed upon the upper marker shaft 75.

The upper marker shaft 75 is rotatable in an eccentric sleeve bearing 76 which is rotatably supported in the marker body 60 in the manner best illustrated in Figures 2 and 5 of the drawings.

The sleeve 74 carries a lug extension 77 having a longitudinal recess 78 therein for receiving the projected end of a pin 79 carried by the spur gear 73. The portion of the pin 79 which projects into the longitudinal recess 78 is engaged at opposite sides by adjusting screws 80. See Figures 2 and 5. It will also be noted by reference to these figures that the sleeve 76 is provided with a worm gear surface 81 which is engaged by an adjusting screw 82 having a turning head 83. By rotating the screw 82 in one direction or the other the eccentric bearing sleeve 76 can be rotated in one direction or the other for altering the position of the axis of rotation of the upper marker shaft 75. By this means the spaced relation of the marker shafts 71 and 75 can be varied for the purpose of adjusting to a nicety the cooperative relation of the marking elements or dies carried by said shafts.

Each of the marker shafts 71 and 75 includes a reduced end 84 extending beyond the marker body 50 and having a seating face 85 against which a die block 86 is secured. The die blocks 86 carry the male and female die elements 87 and

are removably clamped in position on the shaft extensions by having their stems 88 passed through transverse bores 89 in the shaft extensions and secured therein by screw equipments 90. While the die elements are shown as embodying simple forms of co-acting male and female elements in Figures 3 and 4 of the drawings, it is to be understood that the present marker is particularly adaptable to use in heavy duty marking wherein the marking dies are equipped to mark the end closures over the whole or a major portion of the surfaces thereof, including curved line embossing which demands precise interengagement of the male and female embossing elements. The opposed male and female die elements engage in rolling contact during actual marking of the end closures and this engagement is effected through a suitable opening 91 provided in the plate or table 35 in the manner best illustrated in Figure 2 of the drawings.

The intermeshing gears 67, 70 and 73 are preferably protected by a removable cover 92 attached to the marker body 60 and its depending extension 64 in the manner clearly illustrated in Figures 1 and 2 of the drawings.

It will be observed that the upper end of the screw column 28 is secured as at 93 to the marker body 60, 64. Thus by loosening the clamping or securing screws 33 and 63 and by rotating the hand wheel 31, upward or downward movement can be imparted to the screw column 28, the marker body 60, 64, the hanger bracket 56, the bracket extension 54, the bracket plate 32, the plate or table 35, and the end closure stack or feed 38 and the depending housing 39 supported by said plate. It will be obvious that spline shafts 22 and 26 will move vertically with the parts just mentioned without disrupting the power transmitting connections to the marking parts or to the end closure feeding devices.

In operation, as the end closures are discharged one by one from the cover feeding means 38 onto the receiving trackways 36 they are engaged by the feeding finger extensions 52 and moved along said guideways. The compound movement imparted to the finger extensions 52 by simple rotation of the rotor 43 and the relative rotation of the heads 47 and the rollers 48 cause the fingers to have one rapid sweep movement and one retarded movement during each rotation of the rotor 43. It will be observed by reference to Figure 3 of the drawings that the marking station 53 is so related to the position 37 at which the marked end closures are deposited on the turret seats 10 that each finger 52 moves an end closure through the marking station during a part of its rapid sweep movement, and moves the marked end closure into position at 37 for being received on the respective turret seat 10 during a part of its retarded or slowly sweep movement. While each end closure is being moved past the marking station 53 it is engaged in rolling contact by the opposed male and female die elements 87 and suitably embossed.

Whenever the screw and eccentric sleeve equipments 82, 76 are adjusted to vary the spaced relation of the shafts 71 and 75, and therefore the cooperative relation of the marking dies, movement of the eccentric sleeve 76 about its axis serves not only to lift or lower the axis or the shaft 75, but also to move the axis of that shaft laterally. This lateral movement of the shaft 75 would upset the perfect registering relation of the male and female embossing die elements were it not for the provision of the justifying screw equipments 80 illustrated in Figures 2 and 5 of the drawings. After each adjustment of the eccentric sleeve 76 the screw adjustments 80 are utilized to adjust the gears 70 and 73 relative to the shaft 75, thereby to restore perfect registering relation of the male and female die elements.

The marking equipment as herein described is capable of being operated at great speed in marking and has a capacity for making heavy impressions with rotary die elements which may cover the whole can end with embossing instead of the usual one or two lines of characters. It will also be obvious that the marking equipment and the end closure feeding devices can be adjusted upwardly or downwardly as a whole in order to adapt the closing machine for closing containers of different dimensions. It is also possible to utilize the adjusting equipments 57, 59 for adjusting the marker parts and the end closure feeding parts relatively to accurately adjust the cooperative relation of these parts.

It is of course to be understood that the details of structure and arrangement of parts may be variously changed and modified without departing from the spirit and scope of my invention.

I claim:

1. In a machine of the character described, a travelling supporting means having equidistantly spaced receivers thereon on which to receive marked end closures, an end closure supply means, end closure marking means including rotary marking dies engageable in rolling contact with end closures moved therebetween, and means for feeding end closures one by one from the supply to said receivers and through said marking means including devices for moving each end closure rapidly between the marking dies and slowly at the position at which said end closure is received by one of said receivers.

2. In a machine of the character described, a travelling supporting means having equidistantly spaced receivers thereon on which to receive marked end closures, an end closure supply means, end closure marking means including rotary marking dies engageable in rolling contact with end closures moved therebetween, and means for feeding end closures from the supply to said receivers and comprising a rotor rotatable about a vertical axis, a plurality of shafts carried by the rotor with their axes parallel with and disposed in equi-distantly spaced relation about said vertical axis, a rim gear concentric with said axis, a gear carried by each shaft and meshing with said rim gear, a roller carried by each shaft at the upper end thereof and in off-center relation to the axis of the particular shaft, and an end closure feeding finger pivoted to the rotor inwardly of and extending radially over each said shaft and having a radial recess in the under surface thereof for receiving the roller carried by the underlying shaft, said marking means, said turret and said rotor being so cooperatively positioned that each feeding finger will be caused by said rotor and roller equipment to move rapidly between said marking dies and slowly while passing the place at which end closures are received on said receivers.

3. In a machine of the character described, a receiver, a support for a stack of closures, means for feeding closures from the stack support to the receiver, means for marking the closures while they are being so fed, common supporting means for the stack support the closure feed-

ing means and the closure marking means, means for imparting vertical movement to said common supporting means for adjusting the elevation of said common supporting means thereby to effect delivery of the marked closures at a predetermined variable level onto said receiver, said common supporting means including two relatively adjustable portions one supporting the marking means and the other the stack support and closure feeding means, and means for adjusting the relation of said portions for properly aligning said closure feeding means with the marking means.

4. In a machine of the character described, travelling supporting means having equidistantly spaced receivers thereon on which to receive marked end closures, an end closure supply means, end closure marking means including rotary marking dies engageable in rolling contact with end closures moved therebetween, and means for feeding end closures one by one from the supply to said receivers and through said marking means including devices for moving each end closure rapidly between the dies rapidly at the end closure supply means and slowly at the position at which an end closure is received by one of said receivers.

5. In a machine of the character described, travelling supporting means having equidistantly spaced receivers thereon on which to receive marked end closures, an end closure supply means, end closure marking means including rotary marking dies engageable in rolling contact with end closures moved therebetween, and means for feeding end closures one by one from the supply to said receivers and through said marking means including devices for moving each end closure rapidly between the dies with an acceleration of movement from approximately the position at which an end closure is received by one of said receivers to approximately the zone of the end closure supply means and with a deceleration of movement from the end closure supply means to approximately the said position.

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