Feb. 6, 1951 R. A. FAWCETT ET AL 2,540,611

CAN SEAMING MACHINE

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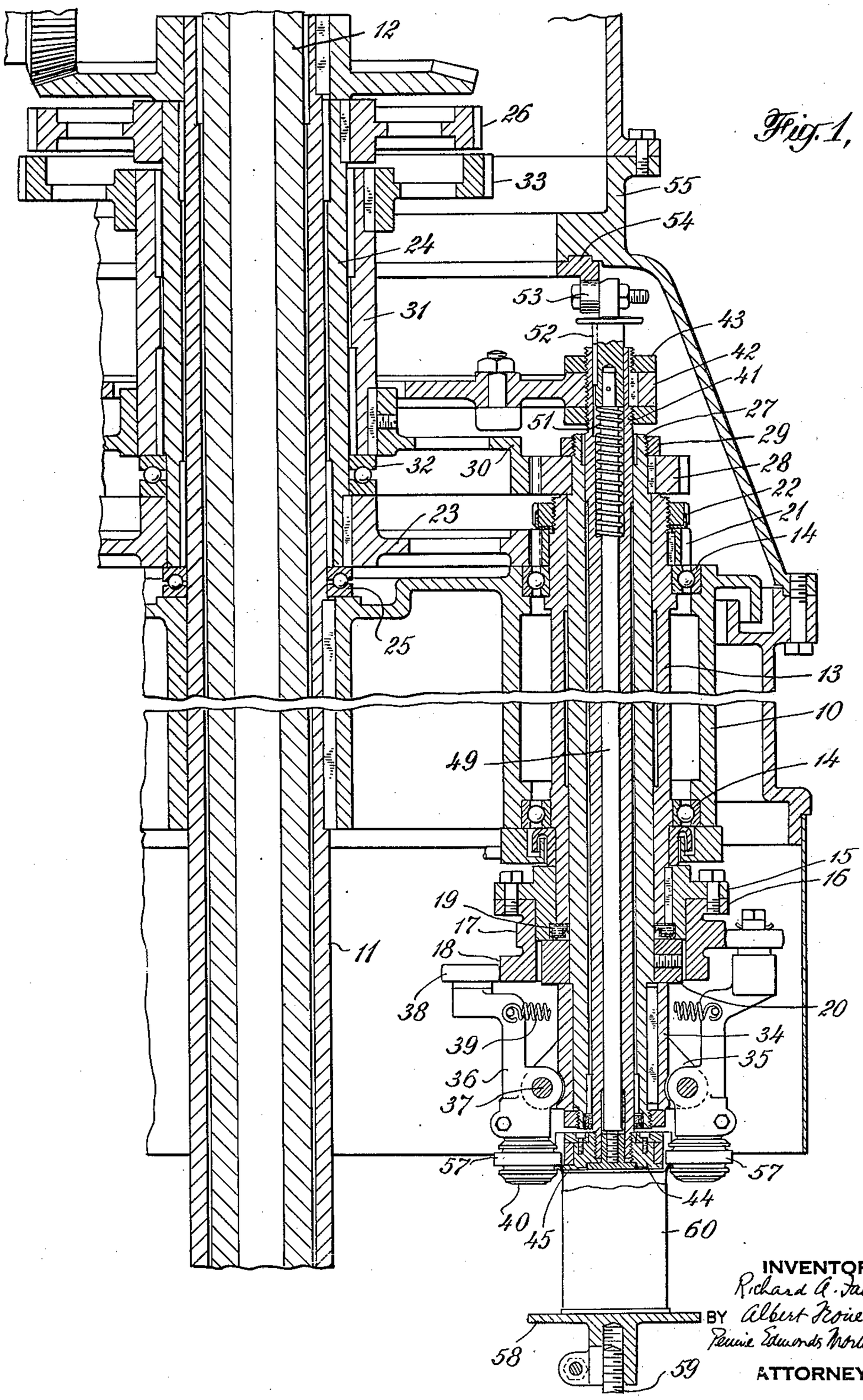

Fig. 1.

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Fig. 2,

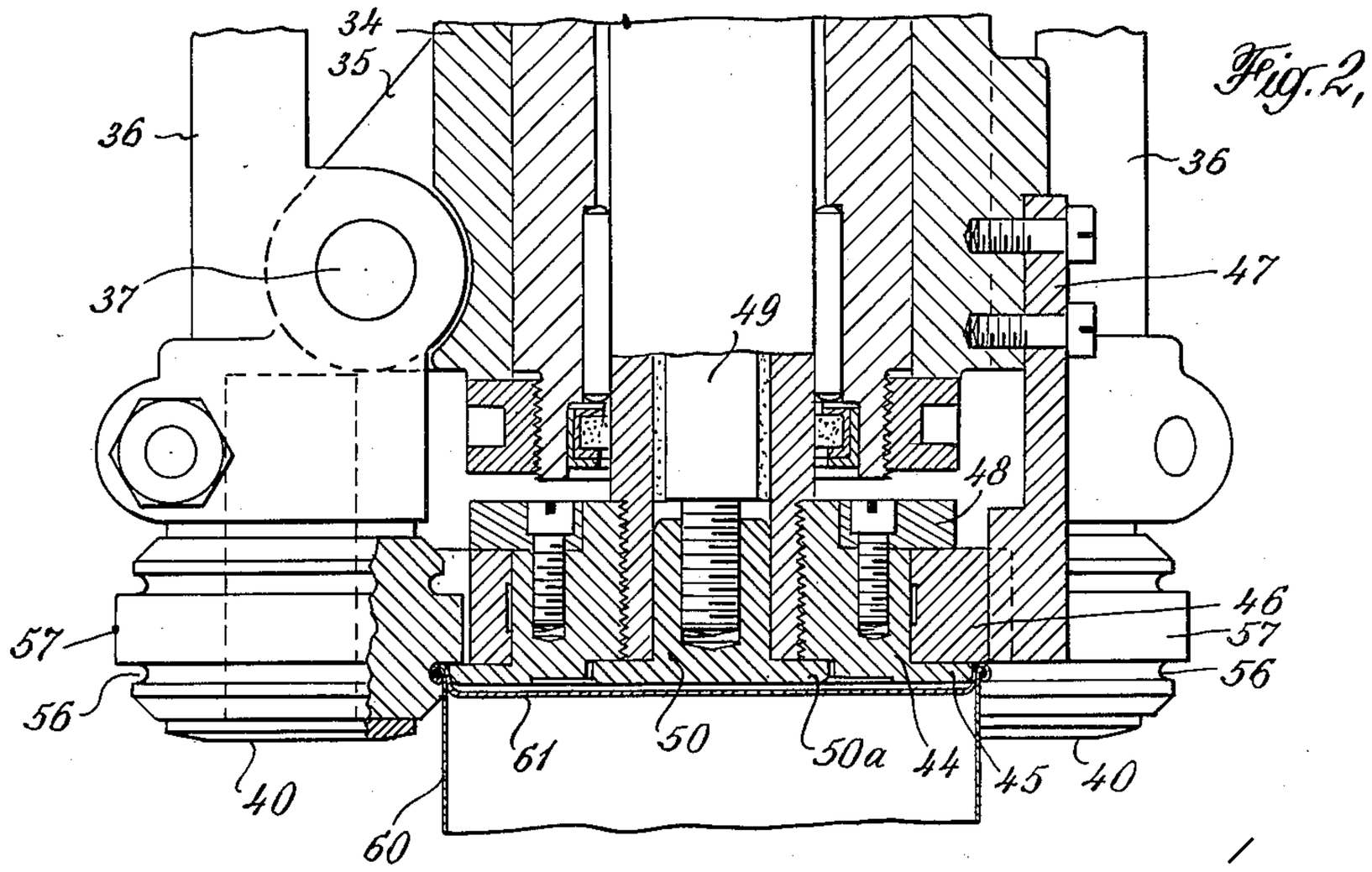

Fig. 3,

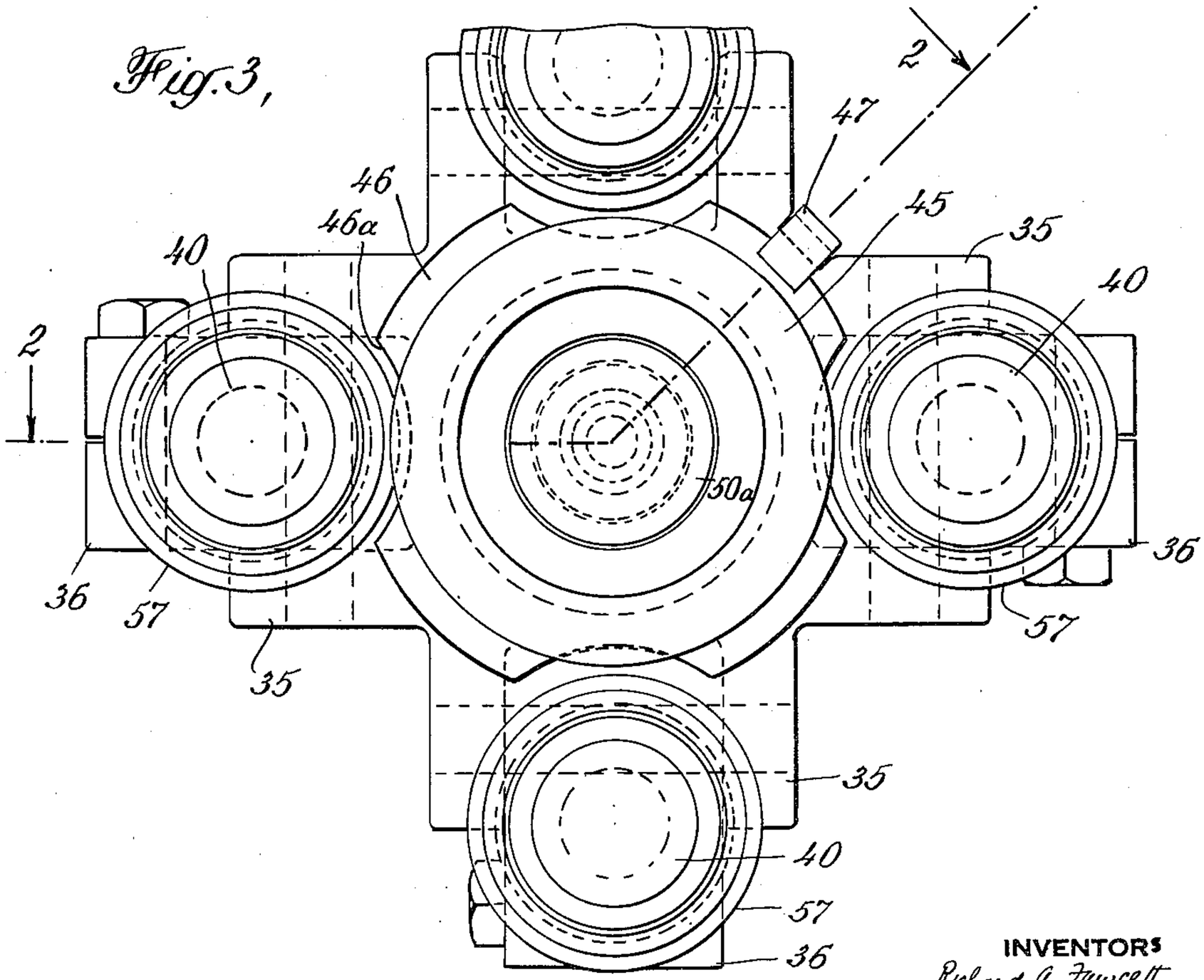

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Fig. 4,

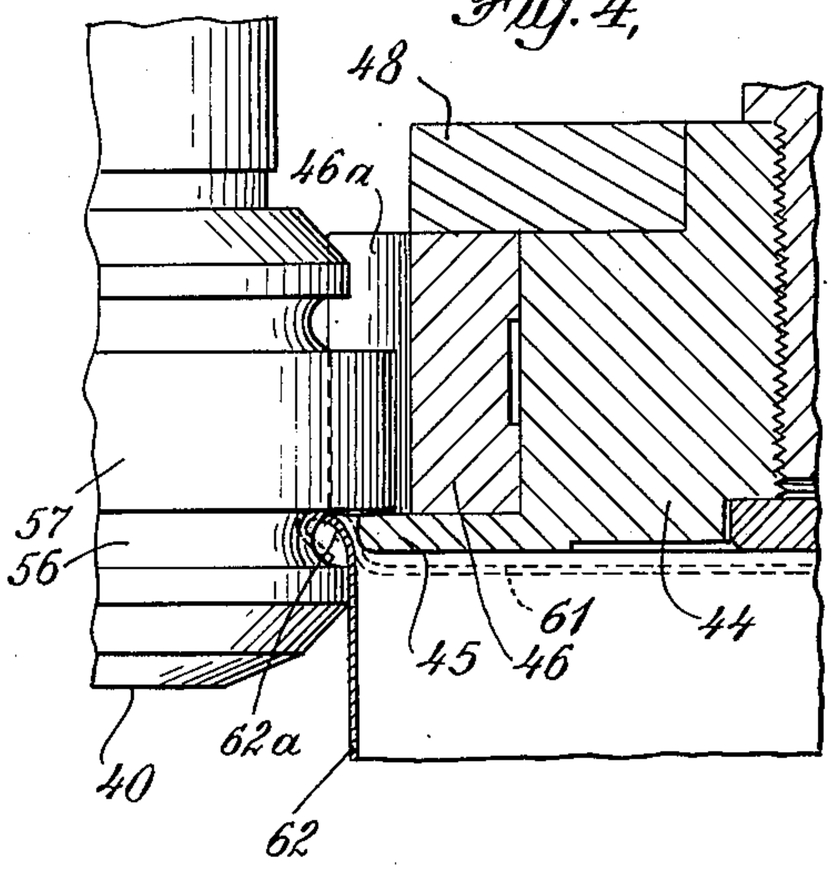


Fig. 5,

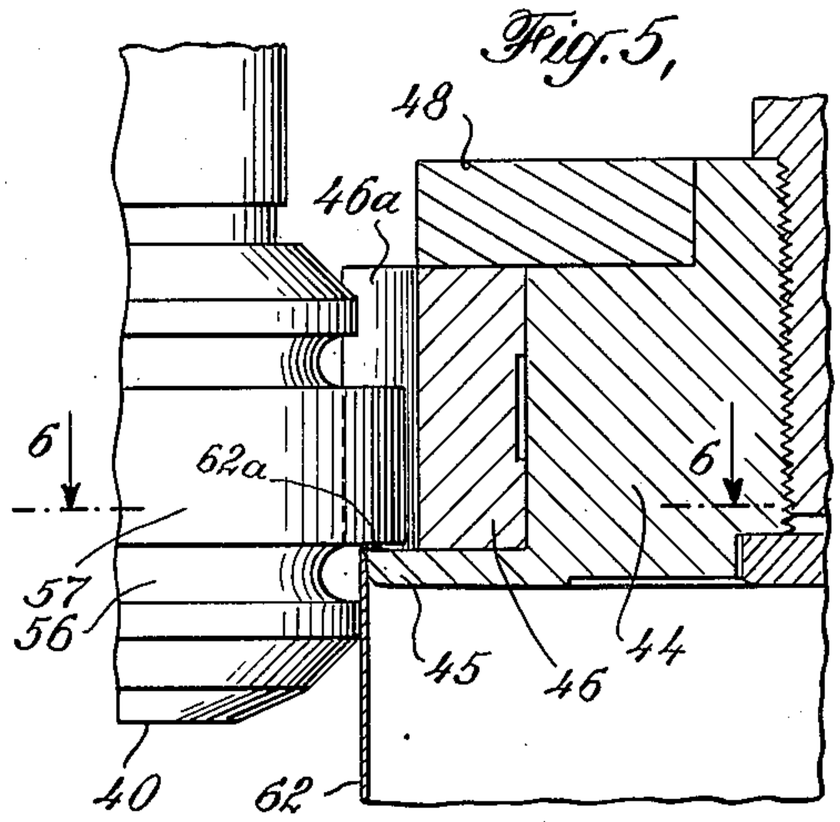


Fig. 6,

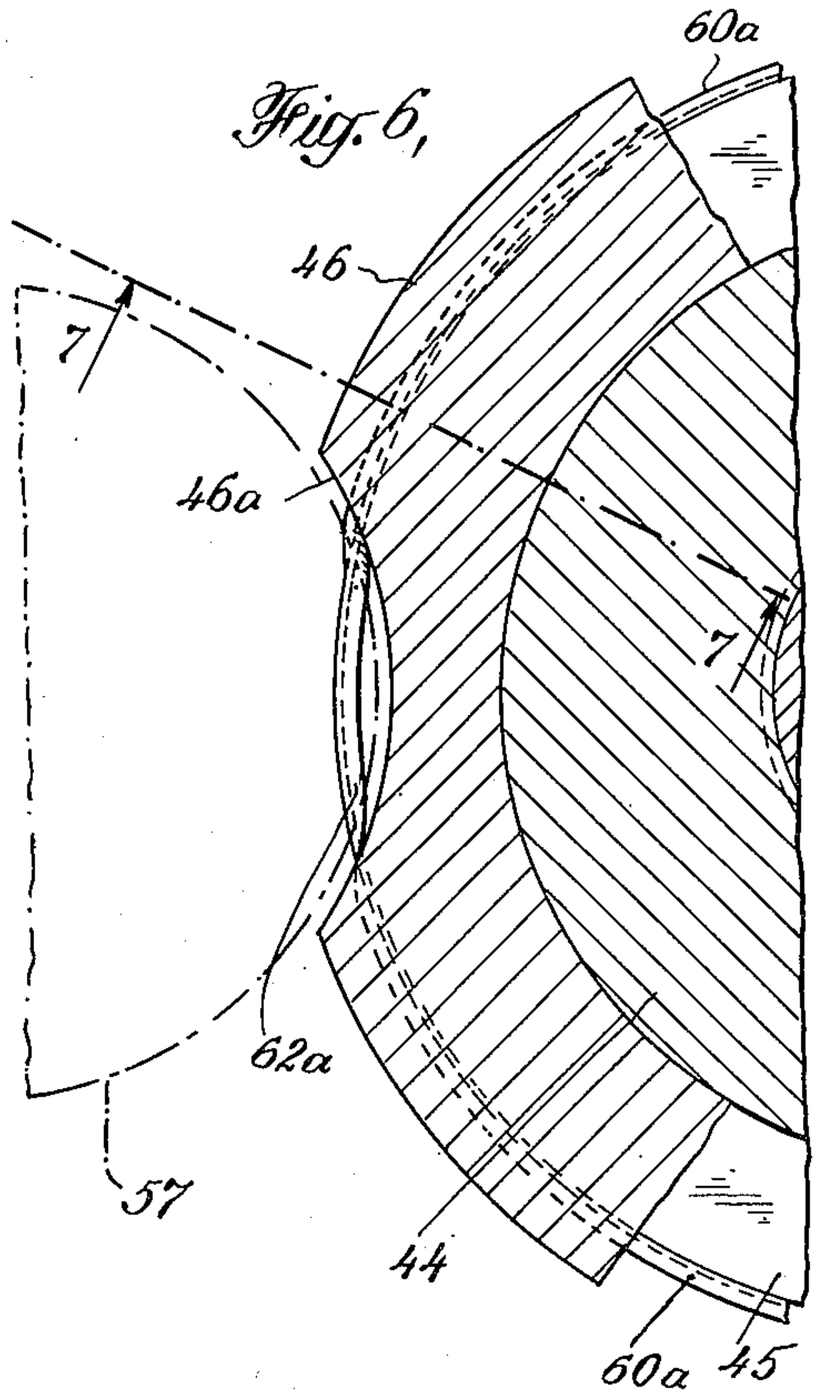
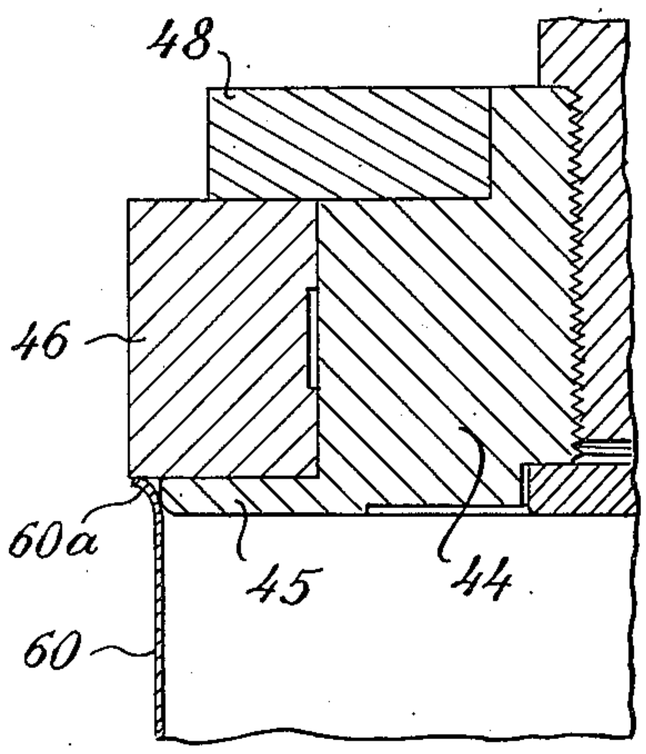


Fig. 7.



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Patented Feb. 6, 1951 2,540,611

UNITED STATES PATENT OFFICE

2,540,611

CAN SEAMING MACHINE

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Application March 4, 1949, Serial No. 79,554

3 Claims. (Cl. 113—24)

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This invention relates to machines for seaming a top or bottom cover with a curled edge, on the flanged end of a cam body, and is concerned more particularly with a machine of the type described, which includes novel means for preventing difficulties now encountered in such machines, when a can body without a cover on the end thereof is acted on by the seaming instrumentalities.

In can cover seaming machines as now commonly constructed, the can body with a cover in place at one end and with the body flange entering the curled edge of the cover rests upon a support during the seaming operation and the cover is held in position by a seaming chuck, which has a radial flange engaging the curled edge from within. The seaming together of the curled edge and the body flange is performed by rollers, each of which has a circumferential seaming groove and a collar, which overlies the chuck flange, when the roller is in seaming position and the curled edge is being acted on by the wall of the groove.

In the operation of such a seaming machine, the can bodies and covers are fed automatically and it sometimes happens that a can body without a cover in place on its upper end is subjected to the seaming operations. When this occurs, the seaming rollers bend the can body flange reversely so that it overlies the flange of the seaming chuck and, when the seaming operation is completed, the can body is secured to the chuck and is not discharged from the machine in the usual way. The machine must then be stopped and the flange of the can body pried loose from the chuck flange. The operation of the seaming means on a can body without a cover in place, accordingly, not only causes stoppages of the machine but, also, if the machine is not stopped quickly, it may become jammed.

The present invention is directed to the provision of means for use in a seaming machine of the type described for preventing a can body, which does not carry a cover, from becoming attached to the seaming chuck, when acted on by the seaming rollers. Such means take the form of a guard ring mounted to rest upon the chuck flange close to its outer edge and provided with recesses, which the collars of the seaming rollers enter, when the rollers are moved into seaming position. The ring is attached to the roller mounting and, when a can body without a cover in place is acted on by the rollers, the flange of the body is turned in over the chuck flange by each roller, as before, but the wall of the recess

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receiving the collar of the roller bends back the turned-in portion of the body flange and releases it from the chuck flange. Accordingly, at the end of the seaming operation, the flange of the can body will not overlie the chuck flange and the can body can be discharged from the machine without difficulty.

For a better understanding of the invention, reference may be made to the accompanying drawings, in which

Fig. 1 is a vertical sectional view through a portion of a seaming machine embodying the invention;

Fig. 2 is a vertical sectional view on an enlarged scale and on the line 2—2 of Fig. 3 of the seaming means of the machine;

Fig. 3 is a bottom plan view of the parts shown in Fig. 2;

Figs. 4 and 5 are views, partly in section and partly in elevation, showing successive stages of the action of the seaming rollers on a can body from which the cover has been omitted;

Fig. 6 is a plan view on the line 6—6 of Fig. 5; and

Fig. 7 is a sectional view on the line 7—7 of Fig. 6.

The machine illustrated in the drawings is of the multiple type, in that it includes a plurality of assemblies, each consisting of a can body support, a seaming chuck, seaming rollers, and a can knock-out. The seaming chuck, rollers, and knock-out are carried by a turret 10, which is secured to and rotates with a tubular drive shaft 11 journalled on a stationary hollow vertical spindle 12. Each assembly comprises an outer tubular shaft 13 extending through an opening near the outer edge of the turret and rotating in bearings 14 at the top and bottom of the opening. Near its lower end, the shaft is encircled by a hub 15, which is keyed to the shaft and is bolted to a cam ring 16 encircling the hub and shaft and having upper and lower circumferential cam surfaces 17, 18. At the lower end of the shaft 13, within the hub 15, there is an oil seal 19 held in place by a ring 20 encircling the shaft and secured thereto by a set screw. At its upper end, shaft 13 is encircled by a pinion 21 keyed thereto and held in place by a lock ring 22 threaded on the shaft. The pinion 21 meshes with a gear 23 encircling and keyed to a tubular shaft 24, which encircles shaft 11 and runs on bearings 25 resting on the hub of turret 10. At its upper end, shaft 24 carries a gear 26 driven by means not shown.

A hollow shaft 27 lies within shaft 13 and car-

ries a pinion 28 at its upper end held in place by a lock nut 29 and meshing with a gear 30 secured to a tubular shaft 31 encircling shaft 24. Shaft 31 rests on a bearing 32 lying between the lower end of the shaft and the upper end of the hub of gear 23. Shaft 31 carries a gear 33, by which the shaft is driven by means not shown.

Near its lower end shaft 27 carries a spider, the hub 34 of which is keyed to the shaft. The spider is provided with a plurality of pairs of lugs 35 extending from hub 34 and lying parallel to radii thereof. An arm 36 is pivotally mounted between the lugs of each pair on a pin 37. At its upper end, each arm carries a roller 38 held in contact with one or the other of the cam surfaces 17, 18 by a spring 39 attached at one end of the arm and at the other end to hub 34. At its lower, each arm carries a seaming roller 40.

A tubular spindle 41 extends through shaft 27 and its upper threaded end passes through an opening in a support 42 and is held in place therein by upper and lower lock nuts 43 threaded on the spindle. Support 42 is connected by means, not shown, to turret 10 to rotate therewith. The lower end of spindle 41 extends below the lower end of shaft 27 and is threaded into a seaming chuck 44. The chuck is formed with a relatively thin radial flange 45 and is encircled by a guard ring 46 connected by a key and slot connection to an arm 47, which is attached to the hub 34 of the spider. Ring 46 is held in place by a lock ring 48 bolted to the chuck.

A knock-out rod 49 extends through the spindle 41 and carries a head 50 at its lower end. The head has a flange 50*a* fitting within a recess in the lower face of chuck 44, so that the lower surface of the head may be flush with the bottom surface of the chuck, when rod 49 is in upper position. The rod is encircled near its upper end by a spring 51 lying within an internal recess in spindle 41 and acting on an end section 52 of the rod, which extends out of spindle 41 and carries a roller 53 engaging a stationary cam ring 54 secured to the casing 55 of the machine. End section 52 telescopes over and is secured to the end of the main portion of rod 49 and is splined to spindle 41, so that it may not rotate relative thereto.

The arms 36 on one side of a diameter of hub 34 of the spider are short and their rollers 38 engage cam surfaces 18, while the arms on the other side of the diameter are long and their rollers engage cam surface 17. Each seaming roller 40 is formed with a curcumferential seaming groove 56, above which the roller has a collar 57 of substantially greater diameter than the bottom of the groove. The construction of the rollers and arms is such that, when an arm is swung to move its roller toward the chuck, the collar 57 on the roller overlies the radial flange 45 on the chuck. The ring 46 is formed opposite each roller with a recess 46*a* having a curved inner wall and, when a roller is moved inwardly, so that its collar 57 overlies the radial flange 45 of the chuck, a portion of the collar lies within the recess.

In the assembling of the machine, it is necessary that the chuck be accurately positioned, so that its radial flange will be properly aligned with the grooves 56 of the seaming rollers, and such adjustment of the position of the chuck may be readily made by means of the lock nuts 43. At the same time, the ring 46 must continue to maintain its proper relation to the chuck flange

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5. If nothing were done to prevent, the turned-in flange 62*a* of the cam body would be caused to grip the chuck flange somewhat more securely by the subsequent action of the second set of seaming rollers. Thereafter, when the seaming operation was finished, the can body would be held on the chuck and would not move down with the base plate, when the latter was lowered. Whenever this action occurs, the machine must be stopped to remove the can body from the chuck and, if prompt action is not taken, the can body retained on the chuck will cause the machine to become jammed.

In a machine embodying the invention, the ring **46** prevents a can body from becoming attached to its chuck. Thus, as a portion of the flange **62***a* of the can body is turned in over the edge of the chuck flange, this turned-in portion of the body flange is immediately engaged by the wall of recess **46***a* in ring **46** and bent outwardly away from the chuck flange. The seaming proceeds, as before, but, at the conclusion of the seaming operation, the can body **62** is no longer gripped to the chuck and, when the base plate **59** is lowered, the can body follows it and is discharged from the machine in the usual way. The provision of ring **46**, accordingly, prevents stoppages and jamming of the machine, because of the supplying thereto of can bodies without covers.

We claim:

1. In a machine for seaming a cover with a curled edge on the flanged end of a can body which comprises a support for the can body with a cover on the upper end thereof, an axially adjustable seaming chuck engageable with the cover and having a radial flange adapted to support the curled edge of the cover from within, a spider coaxial with the chuck, a plurality of arms mounted on the spider for swinging movement into and out of operative position, a roller mounted for rotation on each arm and having a peripheral seaming groove and a collar at one side of the groove, the groove receiving the curled edge of the cover and the can body flange and the collar overlapping the flange on the chuck when the arm is in operative position, means for rotating the spider and support relatively to one another, and means for swinging the arms successively into and out of operative position, the improvement which comprises a ring mounted upon the chuck flange at its outer edge and having a recess for receiving the portion of the collar of each roller overlapping the chuck flange, means carried by the chuck for holding the ring against axial movement relative to the chuck, and means for connecting the ring to the spider to cause the ring to rotate with the spider, while permitting axial movement of the ring relative to the spider.

2. In a machine for seaming a cover with a curled edge on the flanged end of a can body which comprises a support for the can body with a cover on the upper end thereof, an axially adjustable seaming chuck engageable with the cover and having a radial flange adapted to support the curled edge of the cover from within, a spider coaxial with the chuck, a plurality of arms mounted on the spider for swinging movement into and

out of operative position, a roller mounted for rotation on each arm and having a peripheral seaming groove and a collar at one side of the groove, the groove receiving the curled edge of the cover and the can body flange and the collar overlapping the flange on the chuck when the arm is in operative position, means for rotating the spider relatively to the support, and cam means engaging the arms and causing them to swing as they rotate with the spider, the improvement which comprises a ring mounted upon the chuck flange at its outer edge and having a recess for receiving the portion of the collar of each roller overlapping the chuck flange, means carried by the chuck for holding the ring against axial movement relative to the chuck, while permitting the ring to rotate on the chuck, and means connecting the ring to the spider for rotation therewith, while permitting axial movement of the ring relative to the spider relative to the chuck.

3. In a machine for seaming a cover with a curled edge on the flanged end of a can body which comprises a support for a can body with a cover on the upper end thereof, an axially adjustable seaming chuck engageable with the cover and having a radial flange adapted to support the curled edge of the cover from within, a spider coaxial with the chuck, a plurality of arms each mounted on the spider for swinging movement in a plane through the common axis of the spider and chuck, a roller mounted for rotation on each arm and having a peripheral seaming groove and a collar at one side of the groove, the groove receiving the curled edge of the cover and the can body flange and the collar overlapping the chuck flange when the roller arm is in operative position, and means for rotating the support and spiders relative to one another, the improvement which comprises a ring mounted for rotation on the chuck to encircle the latter, the ring resting on top of the chuck flange and having a recess in its periphery for receiving a portion of the collar of each roller overlapping the chuck flange, a second ring mounted fast on the chuck to overlie the first ring inwardly from the bottom of the recesses therein and holding the first ring against axial movement relative to the chuck, while permitting rotational movement of the first ring, and an arm attached to the spider and entering an axial slot in the periphery of the first ring, said arm causing the first ring to rotate with the spider, while permitting said ring to move axially relative to the spider.

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