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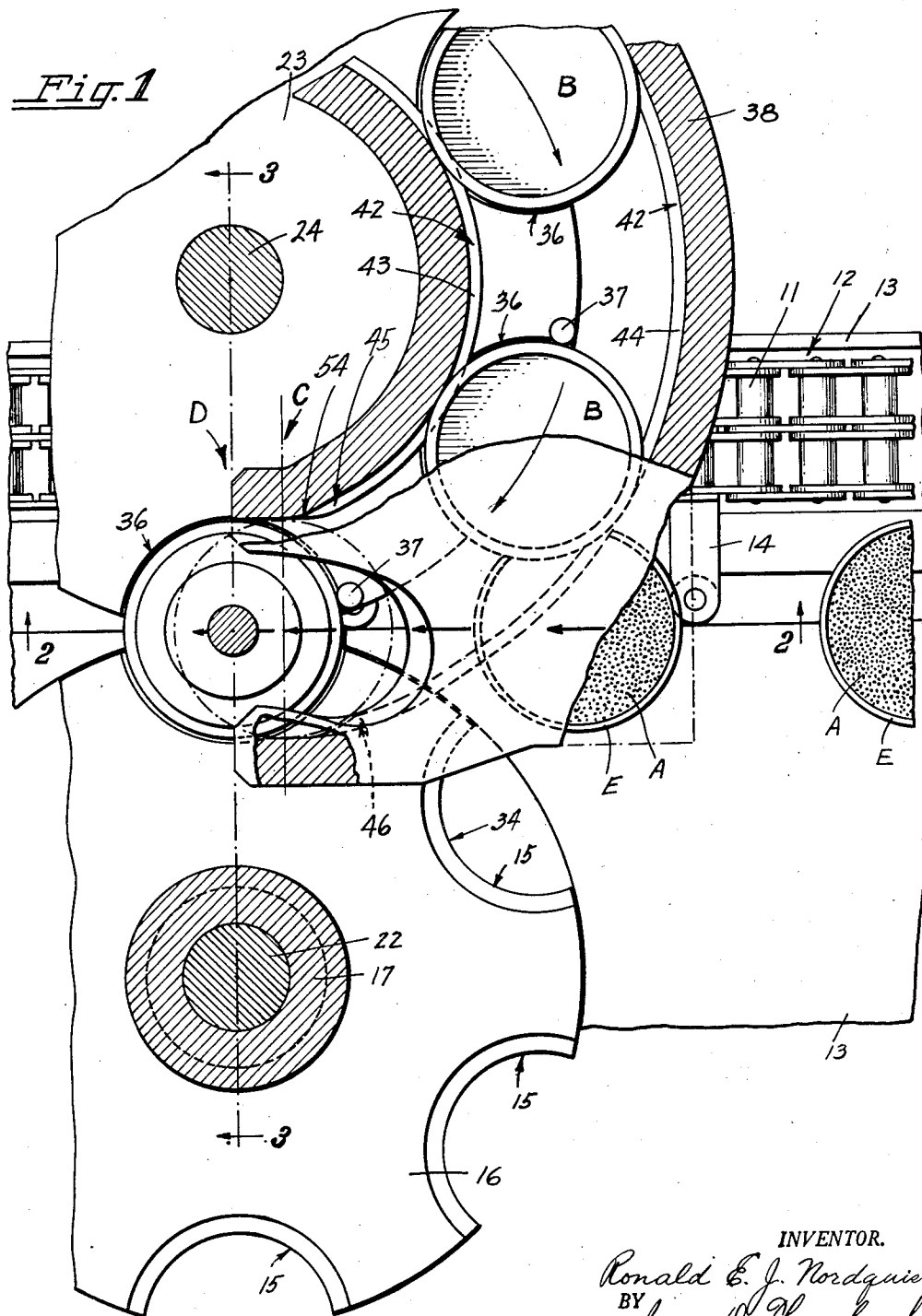
R. E. J. NORDQUIST

2,469,401

CAN CLOSING MACHINE

Filed Dec. 3, 1945

3 Sheets-Sheet 1



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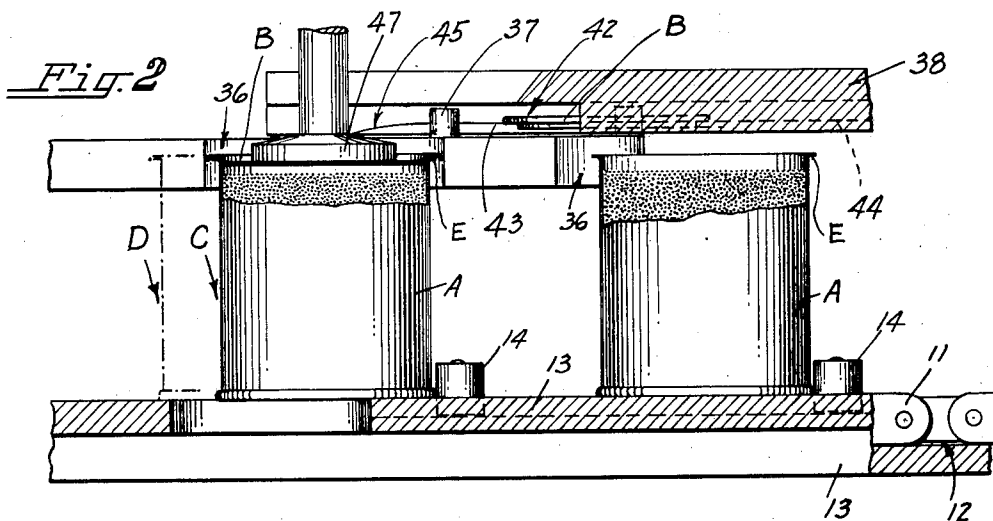
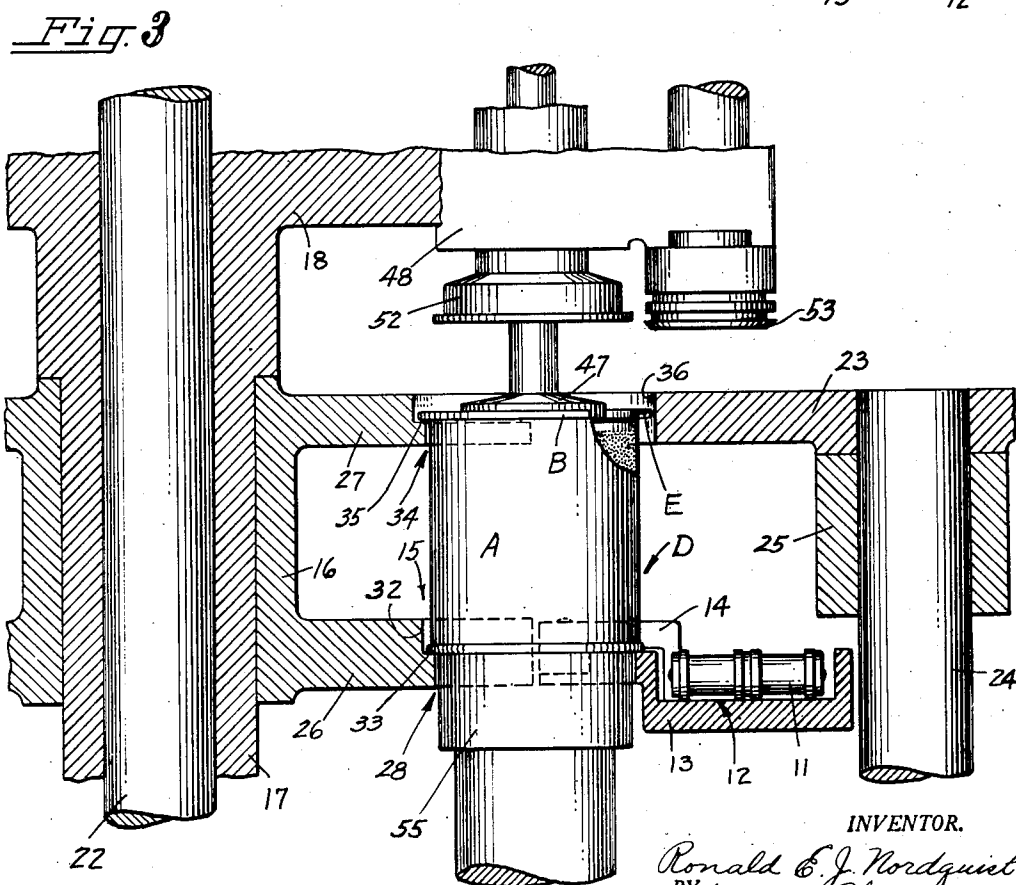
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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

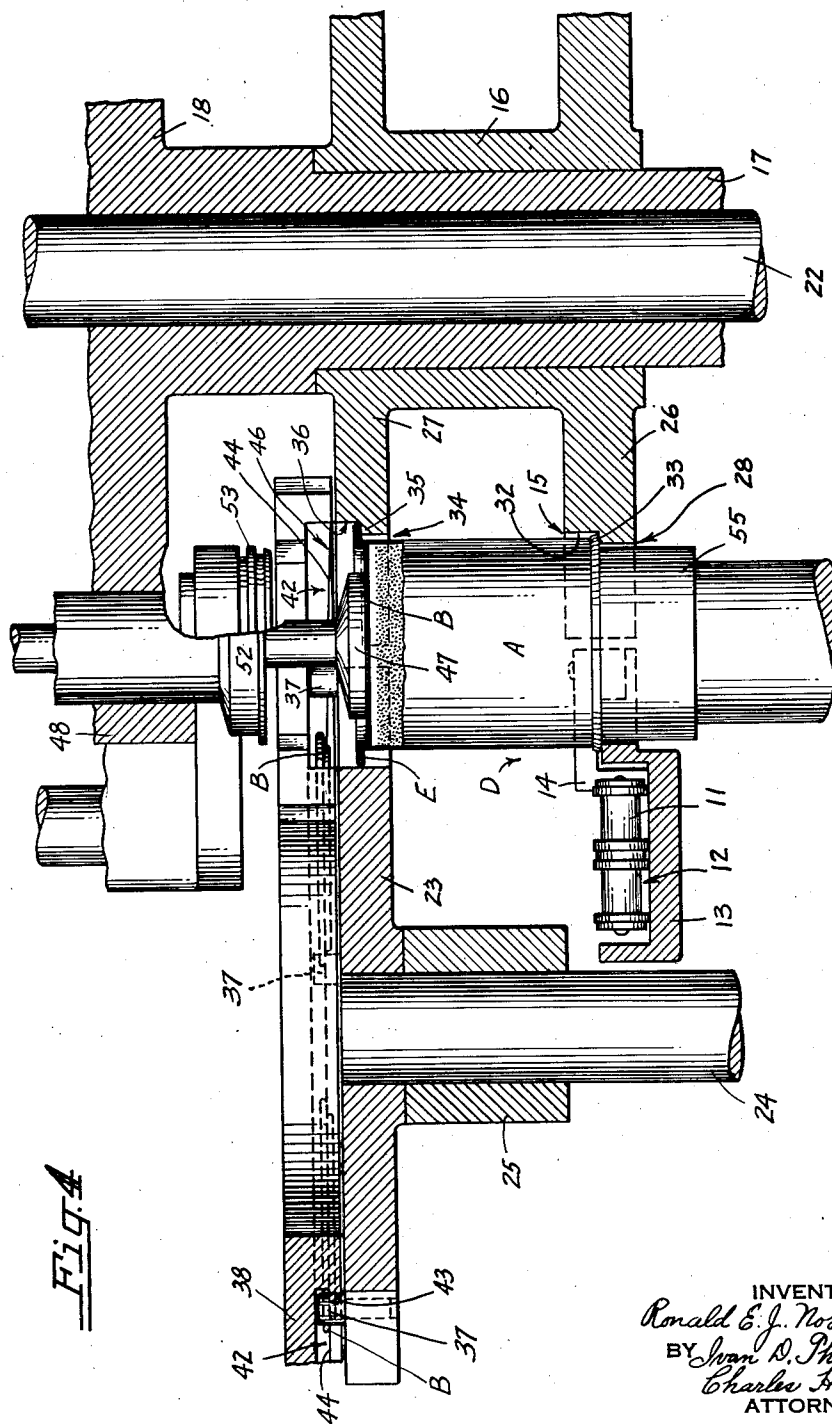


Fig. 4

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UNITED STATES PATENT OFFICE

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CAN CLOSING MACHINE

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2 Claims. (Cl. 113-14)

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This invention relates to can closing machines and the like and has particular reference to can and cover feeding devices for bringing individual covers gradually into parallel and registered position on a filled can while it is being fed along a straight line path of travel preparatory to sealing, thereby preventing spilling of fluid contents of the can.

In the usual form of cover feeding devices, covers are delivered to an assembly station in elevated position above the can and assembly is accomplished by lifting the can to meet the cover. During this lifting action of the can spilling of its contents frequently occurs.

The present invention contemplates overcoming these difficulties by feeding filled cans along a substantially straight line path of travel in a horizontal plane to an assembly station. Can covers for the individual cans are fed from a different source along a curved path of travel and are cammed down gradually to the plane of the top of an advancing can while coming into alignment with the can, the can cover and the can meeting at an assembly station whereupon both can and cover move together along a straight line path of travel to a sealing station.

An object of the invention is the provision in a can closing machine, of a can feed-in device for propelling filled cans to be sealed along a straight line path of travel toward a sealing mechanism and of a can cover feeding device for advancing can covers along a curved path of travel such cover feeding devices bringing individual covers into parallel and registered position onto moving cans so that both can and cover thereafter move along a straight line of travel as an incident to sealing, such can movement being without spilling of any fluid contents from the can.

Another object of the invention is the provision in a machine of the character described having can and cover feeding devices, of stationary means in the cover feed for shifting the can covers from their curved path of travel into a straight line path of travel where the covers advance parallel to and in registration with the filled and moving cans, a registered can and cover being clamped together just prior to sealing whereby spilling of fluid contents of the cans is prevented.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

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Figure 1 is a fragmentary sectional plan view showing the important parts of a can closing machine embodying the present invention;

Figs. 2 and 3 are sectional views taken substantially along the lines 2-2 and 3-3 in Fig. 1; and

Fig. 4 is a sectional view taken substantially along the line 3-3 in Fig. 1 looking in the opposite direction to that indicated by the arrows.

As a preferred embodiment of the present invention the drawings disclose the important parts of a high speed can closing machine wherein an individual can cover is fed into parallel and registered position onto a filled and moving can, so that the can and cover may thereafter move along a straight line path of travel while being clamped together as a unit for introduction into a pocket of a rotatable turret which may be a part of a sealing mechanism for such a can and cover.

Referring now to Figs. 1 and 2 of the drawings, a filled can A is shown as being introduced into the machine by a feed-in conveyor 11 operating in a groove 12 of a conveyor table 13. The conveyor 11 has a plurality of spaced and laterally extending feed arms 14 which engage the side walls of the cans and advance them along the conveyor table 13 in proper sequence for assembly with individual covers B at an assembly station C. The conveyor 11 may be driven in any suitable manner from the present or from an adjacent machine.

The assembly station C is located slightly in advance of a can and cover sealing station D on the straight line path of travel of the moving cans. As a filled can A moves toward station C, the can enters into one of a plurality of turret pockets 15 of a rotatable turret 16. There preferably are six pockets in the turret. The cans A are in the turret pockets when assembling, clamping and sealing of the cans with their respective covers take place.

The heavy arrows extending in a straight line from right to left in Fig. 1 indicate the path of the incoming can. The light curved arrows show the path of the cover. These paths intersect on the center line of the assembly station C and the curved path terminates. Thence from the center line of the assembly station C to the center line of the sealing station D a continuation of the straight path of the heavy arrow then indicates the joint aligned path of travel of both can and cover.

The turret 16 is secured to a hollow sleeve 17 of a rotary member 18 (Fig. 3). This sleeve is

mounted on a vertical shaft 22. Shaft 22 is journaled in suitable bearings in the lower part of the machine which, for the purpose of this invention need not be shown. This shaft may be operated in any convenient manner from its lower end and rotates the turret 16 and the rotary member 18 in unison and in proper time with the conveyor 11.

The covers B are fed individually toward the station C for assembly with the respective cans A by a cover feed turret 23 (Fig. 1). Such a turret is mounted on the upper end of a vertical shaft 24 journaled in a bearing 25 of the machine. Shaft 24 may be driven in any suitable manner in time with the conveyor 11 and with the shaft 22.

The rotatable turret 16 receives and supports both the filled cans A and the covers B and carries them through the seaming operation. For this purpose, turret 16 has a lower horizontal web 26 and an upper horizontal web 27. The pockets 15 are located in the lower web 26. Pockets 15 are formed by semi-circular openings 28 partially surrounded by setback vertical walls 32. This produces a semi-circular support ledge 33 for each pocket. Such a ledge serves to locate and to support the filled cans A initially in its turret pocket.

The upper horizontal web 27 is formed with semi-circular pockets 34. Each pocket 34 is in axial alignment with a turret pocket 15. Pocket 34 is partially surrounded by a semi-circular ledge 35. Such a ledge is cut back sufficiently for entrance of a cover B superimposed on a can flange E formed on the upper end of the filled can A (Fig. 3).

The cover feed turret 23 hereinbefore mentioned also has a plurality of spaced semi-circular pockets 36. There are preferably six such pockets. A pocket 36 is brought into register with a corresponding pocket 34 when a filled can A and its superimposed cover B are delivered into sealing position at station D (Figs. 1 and 3). It is at this time that the pockets 34, 36 cooperate to encircle the outer periphery of the cover B so that it is aligned onto the flange E of the can incidental to a sealing operation.

Preparatory to the covers reaching the cans, they are separated in conventional manner from a suitable source of supply and then are advanced by the turret 23. A feed finger or stud 37 is secured in the turret back of each pocket 36. These fingers extend up to engage and to advance the cover which is directly above but not yet into the corresponding turret pocket.

The covers B are supported, while being so advanced, in a stationary cover carrying segment plate 38 mounted on the machine main frame. This segment plate is located above the turrets 16 and 23 and above the conveyor 11 (Figs. 1 and 2). The segment plate 38 is formed with a track 42 on its under surface and such a track includes inner and outer support or cover carrying ledges 43, 44. This support track may be formed separately or as an integral part of the segment plate 38.

The inner and outer support ledges 43, 44 terminate adjacent the assembly station C in rounded and gradually sloping edges 45, 46 (Figs. 1 and 2). It is over these edges that the peripheral edge of each cover B passes as it descends into the turret pocket and thence onto a filled can A at the assembly station C.

As the cover B descends into the position just described at station C, a can knockout 47 moves down, engages the top of the cover and

then holds it onto the filled can A. This prevents any subsequent spilling of the contents from the can as it is advanced further. The can A coming into the station C moves onto and over the turret pocket ledge 33, the rear edge of the can bottom still resting on the conveyor table 13.

The can knockout 47 constitutes part of a conventional seaming head mechanism 48, there being six such seaming heads, one for each turret pocket. Each seaming head turns in the rotary member 18 and includes a seaming chuck 52 and a coaxing seaming roller 53 operable against the chuck for a seaming operation.

The movement of the cover B up to this time has been along a substantially circular path of travel while that of the filled can has been along a substantially straight line path of travel. It is desirous and also the purpose of this invention to change the path of travel of the cover at this point so that it moves in the straight path with the advancing can. This is done by a shifting of the cover B outwardly relative to the center of the rotating turret 23, the cover remaining in the turret pocket 36. There is no pause in the cover or can advancement from the assembly station C to the sealing station D.

In order to effect this change in travel during the advancement of the cover B, the terminal end of the track 42 in the segment plate 38 is so shaped as at 54, to shift or cam the cover into the desired straight line path of travel. This is best illustrated in Fig. 1 of the drawings.

During advancement toward station D the cover is held onto the can by the can knockout 47. The can and its cover are only momentarily on the turret ledge 33 prior to being lifted and rotated for seaming as will now be described.

Preparatory to the sealing operation, the can and cover are tightly clamped together and are lifted into sealing position. This is accomplished by a rotatable plunger 55 (Fig. 3) which is operated in time with other moving parts of the machine. There are six such plungers, one for each of the turret pockets. Plunger 55 moves up and engages within the countersunk bottom of the can A to center the can and to lift it together with the cover B and also the knockout 47. This tightly clamps the can and cover between the can knockout and the plunger which move up as a unit until the cover B is against the seaming chuck 52. Can and cover thereupon rotate at high speed through the driving action of the seaming chuck 52. The seaming roller 53 moves in at the proper time to effect the seaming operation in the usual manner.

The seaming operation is carried out while the turret 16 is rotated. Can and cover upon being sealed are lowered and discharged from the machine. Other filled cans and covers then enter into the emptied turret pocket 15 and the cycle of operation is repeated.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. In a can closing machine for sealing covers onto filled cans, the combination of a rotatable seaming turret having spaced peripheral pockets for receiving cans and covers for sealing, a can

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feed-in device for propelling filled cans along a straight line path of travel toward said sealing turret and for introducing them into said sealing turret pockets, a can cover feeding device for advancing can covers along a curved path of travel and for introducing a can cover into a sealing turret pocket in a position above a can received in said pocket, means for moving an advancing can cover out of its curved path of travel and into a straight line path of travel in alignment with the straight line path of travel of the moving cans, and means disposed adjacent the path of travel of said covers for supporting and gradually lowering the aligned advancing cover to position it on said received and pocketed can for retaining the fluid contents in the can during further movement.

2. In a can closing machine for sealing covers onto filled cans, the combination of a rotatable sealing turret having spaced peripheral pockets for receiving cans and covers for sealing, a can feed-in device for propelling filled cans along a straight line path of travel toward said sealing turret and for introducing a can cover into a sealing turret pocket in a position above a can received in said pocket, means for moving an advancing can cover out of its curved path of

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travel and into a straight line path of travel in alignment with the straight line path of travel of the moving cans, means disposed adjacent the path of travel of said covers for supporting and simultaneously and gradually lowering the aligned advancing cover to position it on said can, and means for clamping the lowered can cover onto the pocketed can for retaining the fluid contents in the can during further movement.

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