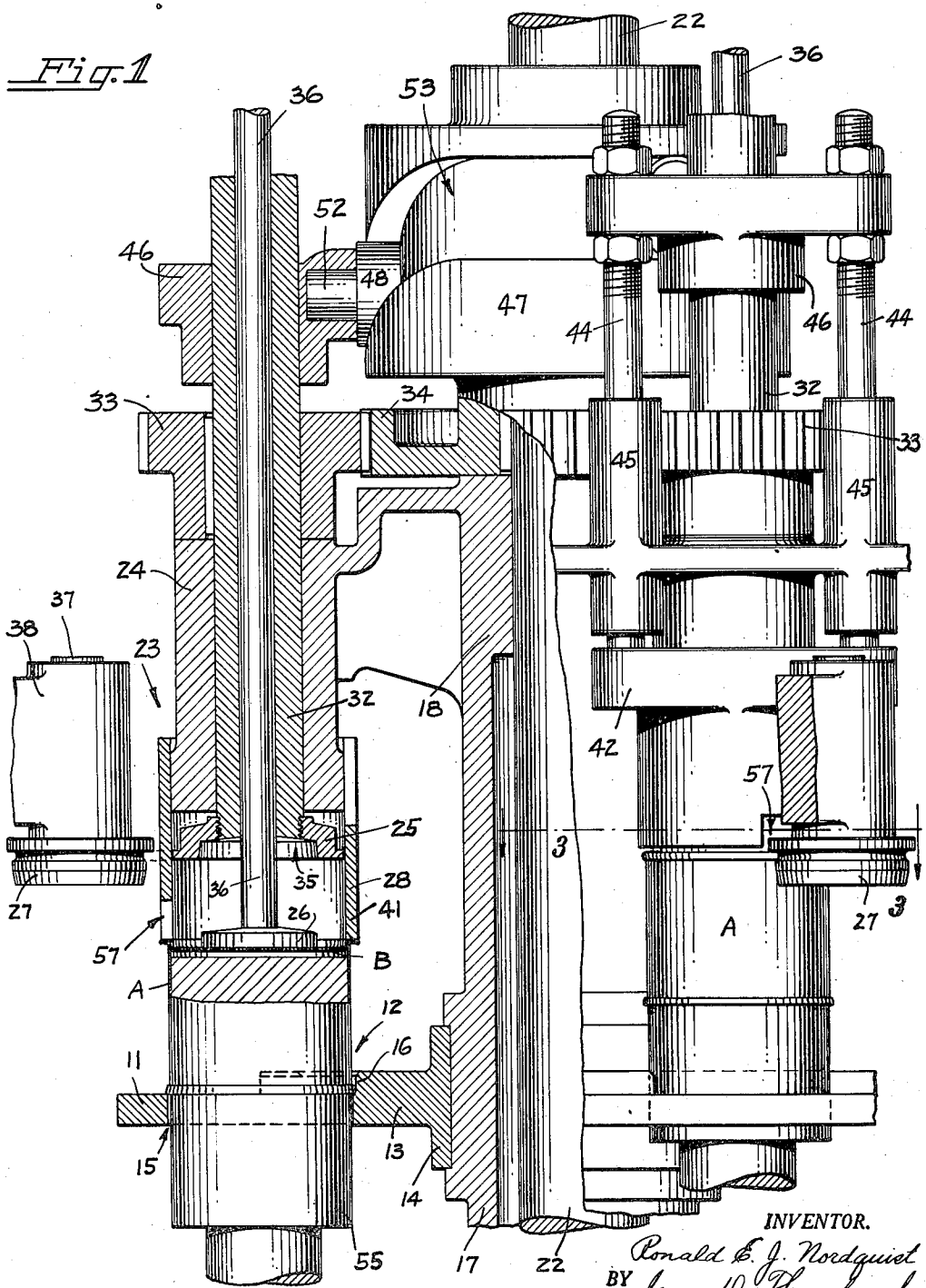
Aug. 24, 1948. R. E. J. NORDQUIST 2,447,524

CAN CLOSING MACHINE

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Fig. 1



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Fig. 2

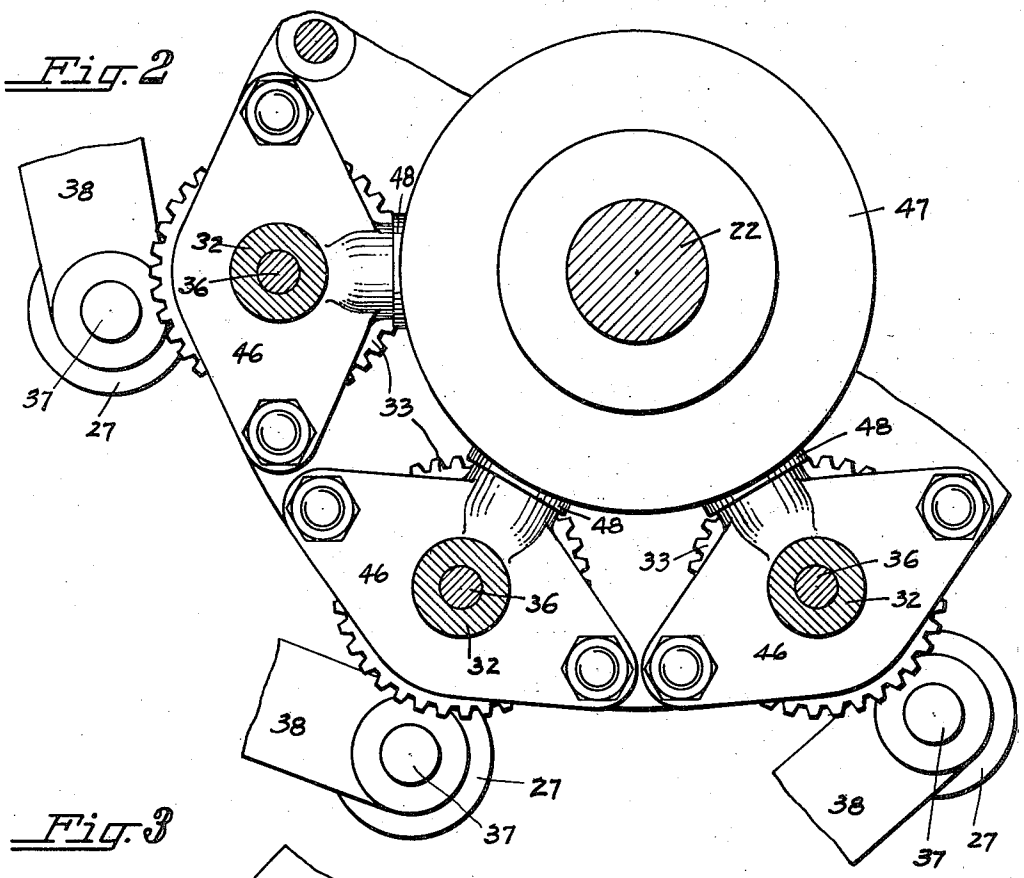
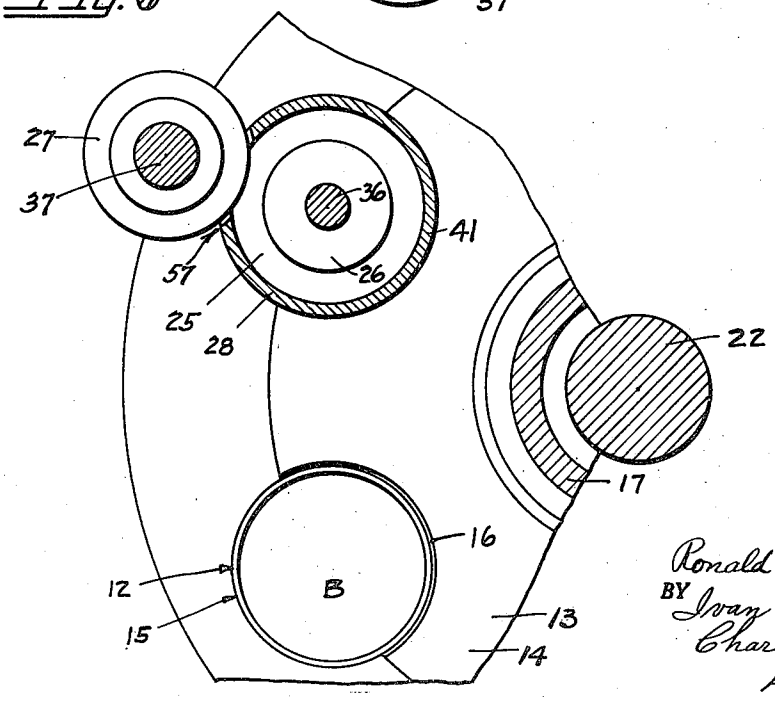


Fig. 3



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CAN CLOSING MACHINE

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4 Claims. (Cl. 113—23)

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This invention relates to can closing machines and the like and has particular reference to a movable sleeve which is actuated to engage the top marginal flange of a cover to hold the cover tightly against a filled can during a non-rotating rest period to prevent spilling of the can contents when such a can and cover are shifted and rotated as an incident to sealing them together.

An object of the invention is the provision in a can closing machine, of a sleeve movable in a vertical plane for clamping and holding the marginal flange of a cover tightly against the flange of a filled can to effect sealing contact therebetween while can and cover are in a non-rotating position, this sealing contact being maintained to prevent escape of the can contents when the can and cover are shifted into a position for a sealing or seaming operation.

Another object of the invention is the provision in a machine of the character described, of a movable non-rotatable sleeve surrounding a rotatable seaming chuck which is actuated against a cover superimposed on a filled can for pressing the cover tightly against the can while it is at rest to compress solid contents into the can so that spilling of the contents will be prevented when such a can and cover are shifted and are brought into rotation preparatory to a seaming operation.

A further object of the invention is the provision in such a machine, of a vertically movable sleeve surrounding a rotatable seaming chuck and engageable against a cover superimposed on an excessively filled can to press the contents into the can and to sever or strip off protruding parts of the contents that have been forced out of the can.

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:

Figure 1 is a combination vertical sectional view and vertical elevation of a can closing machine embodying the present invention;

Fig. 2 is a top plan view of parts of the machine illustrated in Fig. 1; and

Fig. 3 is a fragmentary horizontal sectional view taken substantially along the line 3—3 in Fig. 1.

As a preferred embodiment of the present invention the drawings disclose the important parts of a high speed can closing machine wherein filled cans A with their superimposed covers B are

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brought to rest in a non-rotating position momentarily over an opening in a support such as a seat ledge in the pocket of a rotatable turret to press the contents into the can and to hold the cover tightly against the can to prevent spilling of contents therefrom as such a can and cover are shifted and rotated preparatory to a sealing operation.

In the instant invention the covers B are pressed down onto the filled cans A by a movable sleeve element which engages against the top marginal edge of the cover to hold the cover flange against the flange of a filled can to compress the contents therein prior to sealing.

Referring now to Fig. 1 of the drawings a filled can A is shown together with its cover B in a non-rotating position as it rests on a ledge seat 11 formed in a pocket 12 of a web 13 of a rotatable turret 14. There preferably are six such pockets in the turret, each pocket being defined by an opening 15 which is surrounded partially by a semi-circular vertical ledge 16. Such a ledge serves to locate the can A initially over the opening 15 in its turret pocket.

The turret 14 is secured to a hollow sleeve section 17 of a rotary member 18. This sleeve section is carried on a main vertical shaft 22. Sleeve section 17 and shaft 22 are both journaled in suitable bearings in the lower part of the instant machine which for the purpose of this invention need not be shown. The sleeve section 17 and the shaft 22 may be operated in any convenient manner at different speeds from their lower ends, the shaft being rotated faster than the sleeve section since it is this shaft that operates the rotatable chucks. This will be described hereinafter.

The rotary member 18 carries suitable seaming heads 23 (see also Figs. 2 and 3) the member being formed with bosses 24. There is a seaming head unit for each turret pocket. Each seaming head unit includes a rotatable seaming chuck 25, a can knockout device or pad 26, cooperating seaming rollers 27 and a non-rotatable sleeve 28. Sleeve 28 surrounds the chuck.

Each seaming chuck 25 is mounted on the lower end of a hollow vertical shaft 32 journaled in suitable bearings in each boss 24. These sleeve shafts 32 are driven by gears 33, such a gear being mounted on the upper end of each shaft. Gears 33 mesh with and are driven by a central gear 34 (Fig. 1) mounted on the upper end of the vertical shaft 22. Thus it will be seen that while the turret 13 and the rotary member 18 make one revolution, the various chucks 25

through their gears 33 mating with the gear 34 and driven by the shaft 22 are rapidly positively driven and spun for the seaming operation.

The seaming chucks 25 are of the conventional form, each being formed to fit within the countersunk section of a cover B (Fig. 1). Such a chuck is provided with a recess as at 35 within which the can knockout pad 26 is disposed during a seaming operation. Each can knockout is carried at the lower end of a stem 36 which extends through its associated hollow vertical shaft 32.

Each can knockout device 26 is operable relative to its associated seaming chuck 25 by reciprocation of its carrying stem 36 which moves vertically within the shaft 32. This may be performed in the usual manner by suitable operating means applied to the upper end of the stem 36. Such operation is in time with other moving parts of the machine.

The seaming rollers 27 are freely rotatable on pins 37 carried in seaming roll rocker arms 38 (Figs. 1 and 2). Each rocker arm 38 may be mounted on a suitable rocker shaft (not shown) carried in the machine main frame. This is a well known construction in can closing machine which for the purpose of this invention need not be shown. Each rocker arm 38 is operated in the conventional manner to bring its roller 27 into engagement against the flange of the cover B while can and cover are being rotated by the chucks 25. This is the usual seaming operation.

Each non-rotatable sleeve 28 comprises a tubular section 41 (Figs. 1 and 3). This tubular section is formed with a pair of lugs 42 at the upper end. Each sleeve is slidable vertically on a lower enlarged end of the boss 24. For this purpose vertical rods 44 are provided which are secured at their lower ends in the lugs 42. There are two such rods for each sleeve. Rods 44 slide in suitable bearings in bosses 45 which are an integral part of the rotary member 18.

The upper ends of the rods 44 are bolted to sleeve carriers 46, there being one such carrier for each of the chucks 25. These sleeve carriers are not rotatable on the shafts 32 they having mere axial movement thereon. The axial movement is effected through a stationary cam 47. This cam surrounds the upper end of the shaft 22 and is held against rotation in any suitable manner upon the machine frame hereinbefore mentioned.

A cam roller 48 is rotatably mounted on a pin 52 secured in each sleeve carrier 46 (Figs. 1 and 2). The cam rollers 48 operate in a cam groove 53 of the cam 47 and thus move the respective sleeves in proper sequence with the rotation of the rotary member 18 through a seaming operation.

The filled cans A with their respective covers B superimposed thereon are shifted from their momentary non-rotating rest position on the ledge seats 11 of the turret by rotatable vertically reciprocable lifter plungers 55. There are a plurality of such plungers, one for each turret pocket. The plungers 55 are mounted and operated in any suitable manner from beneath the turret 14. These lifter plungers are disposed in vertical alignment with the respective seaming chucks 25 and are moved through the openings 15 in the individual turret pockets to lift the filled can and cover into seaming position.

Before the can is lifted from the ledge seat of a turret pocket, the can knockout 26 and the non-rotatable sleeve 28 are moved down simultaneously to engage the top of the cover B and hold it against the top flanged edge of the filled can. This position is best viewed on the left in Fig. 1. During this action the can knockout 26 engages the central panel section of the cover while the sleeve 28 engages the peripheral flange of the cover. This prevents buckling of the cover. This action presses the contents of excessively filled cans into the cans severing or stripping off any overhanging or protruding parts. Cans with covers held in this manner are closed against spilling of the contents.

As the plunger 55 starts moving upwardly into engagement with the bottom of the filled can, the can clamps the cover against the can knockout 26 and the sleeve 28. The clamped can and cover then are lifted from the position shown on the left in Fig. 1 into a sealing position as shown on the right of that figure. Just prior to reaching the sealing position, the non-rotatable sleeve 28 is quickly lifted by the cam 47 and groove 53 and is moved out of engagement with the cover B. When the cover finally reaches the seaming chuck 25 rotation of the filled can and cover starts immediately. The sleeve 28 being above the spinning cover during the seaming operation, rubbing of the cover is prevented.

Provision is made in the side wall of the non-rotatable sleeve 28 for entry of the seaming roller 27 into engagement with the can cover on the seaming chuck 25. A clearance opening 57 at the lower outside edge of the sleeve provides for such entry.

Hence it will be observed that it is the upward movement of the lifter plunger 55 that clamps the filled can A and cover B against the seaming chuck 25 and results in the rapid rotation of the can and cover. The seaming roller 27 now moves in against the cover B in the usual manner thus sealing the cover onto the can.

Following the sealing operation the seaming roller 27 moves outwardly and the plunger 55 descends to return the sealed can and cover into initial position on the ledge seat 11. The can knockout 26 cooperates with this lowering action of the plunger in the conventional manner thereby releasing the sealed and seamed cover from the rotatable chuck 25. The sealed can thereafter is discharged from the machine and the cycle of operation then is repeated on other filled cans and covers.

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. A can closing machine for sealing covers onto filled cans, comprising a seaming head including a rotatable chuck having means for rotating the same and a seaming roller for sealing a cover onto a filled can, a support turret beneath the seaming head having a ledge seat disposed about a turret opening in vertical alignment with said chuck for supporting a filled can with its superimposed cover, a vertically movable non-rotatable sleeve surrounding said chuck above said turret seat, means for moving the sleeve downwardly into engagement with the peripheral portion of a can supported cover on said turret seat to press the cover tightly against

the can to prevent escape of the can contents and for maintaining such engagement during subsequent lifting of the can, and a rotatable plunger vertically movable through said turret opening for engagement with the bottom of the can to lift the can with its superimposed cover from said seat into rotative engagement with the rotating chuck to cause the can and cover to rotate, said sleeve moving means being further operable to lift said sleeve out of engagement with said cover immediately prior to engagement of said chuck and said seaming roller with the can cover to rotate the can and cover to seam the cover onto the can.

2. A can closing machine for sealing covers onto filled cans, comprising a seaming head including a series of rotatable chucks having means for rotating the same and each having a seaming roller for sealing a cover onto a filled can, a rotatable support turret disposed beneath the seaming head and having a plurality of circumferentially spaced ledge seats disposed about a series of circumferentially spaced turret openings, said seats being respectively disposed in vertical alignment with said chucks for supporting filled cans with their superimposed covers, a plurality of circumferentially spaced vertically movable non-rotatable sleeves respectively surrounding said chucks above the cans on said seats, cam actuated means for moving the sleeves downwardly into engagement with the peripheral portions of the can supported covers on said turret seats to press the covers tightly against the cans to prevent escape of the can contents and for maintaining such engagement during subsequent lifting of the cans, and a plurality of rotatable plungers vertically movable through said turret openings for engagement with the bottoms of the cans to lift the cans with their superimposed covers from said seats respectively into rotative engagement with the rotating chucks to cause the cans and covers to rotate, said cam actuated sleeve moving means being further operable to lift said sleeves out of engagement with said can covers just prior to engagement of said chucks and said seaming rollers with the can covers to rotate the cans and covers to seam the covers onto the cans.

3. In a can closing machine for sealing covers onto filled cans, the combination of a seaming head including a rotatable chuck and a seaming roller for sealing a cover onto a filled can, means for rotating said chuck, a support turret disposed beneath said seaming head and having a ledge seat disposed about an opening in the turret and in vertical alignment with said chuck for non-rotatably supporting a filled can with its superimposed cover, a vertically movable can knock-out device located within said chuck and engageable with the cover of a can supported on said ledge seat during subsequent lifting of the can, a vertically movable non-rotatable sleeve surrounding said chuck and said knock-out device, means for moving the sleeve into engagement with the peripheral portion of the cover of a can on said ledge seat to press the cover tightly against the can to prevent escape of the can contents and for maintaining such engagement during subsequent lifting of the can, and a rotatable plunger vertically movable through said turret opening for engagement with the bottom of the can to lift the can with its superimposed cover from said turret ledge seat into rotative engagement with the rotating chuck to cause the can and cover to rotate, said sleeve moving means being further operable prior to the engagement and rotation of the can by said chuck for lifting said sleeve out of engagement with said can cover prior to engagement of said seaming roller against the rotating cover to seam the cover onto the can.

4. In a can closing machine for sealing covers onto filled cans, the combination of a seaming head including a series of rotatable chucks each having a seaming roller for sealing a cover onto a filled can, means for axially rotating said chucks, a rotatable support turret disposed beneath said seaming head and having a plurality of circumferentially spaced ledge seats respectively disposed about a series of circumferentially spaced openings in the turret, said seats being respectively in vertical alignment with said chucks for non-rotatably supporting filled cans with their superimposed covers, a vertically movable can knock-out device located within each of said chucks and engageable with the cover of a can supported on said ledge seat during subsequent lifting of the can, a vertically movable non-rotatable sleeve surrounding each of said chucks and knock-out devices, means for moving said sleeves downwardly into engagement with the peripheral portion of the non-rotating covers of the cans on said ledge seats to press the covers tightly against the non-rotating cans to prevent escape of the can contents and for maintaining such engagement during subsequent lifting of the cans, and a plurality of rotatable plungers vertically movable through said turret openings respectively for engagement with the bottoms of the cans to lift the cans with their superimposed covers from position on said ledge seats into rotative engagement with the rotating chucks to cause the cans and covers to rotate, said sleeve moving means being further operable prior to the engagement and rotation of the cans by said chucks for lifting said sleeves out of engagement with said can covers prior to engagement of said seaming rollers against the rotating covers to seam the covers onto the cans.

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