Dec. 2, 1941. N. PELOSI 2,264,330

CAN END ASSEMBLING MACHINE

Filed Aug. 22, 1940 2 Sheets-Sheet 1

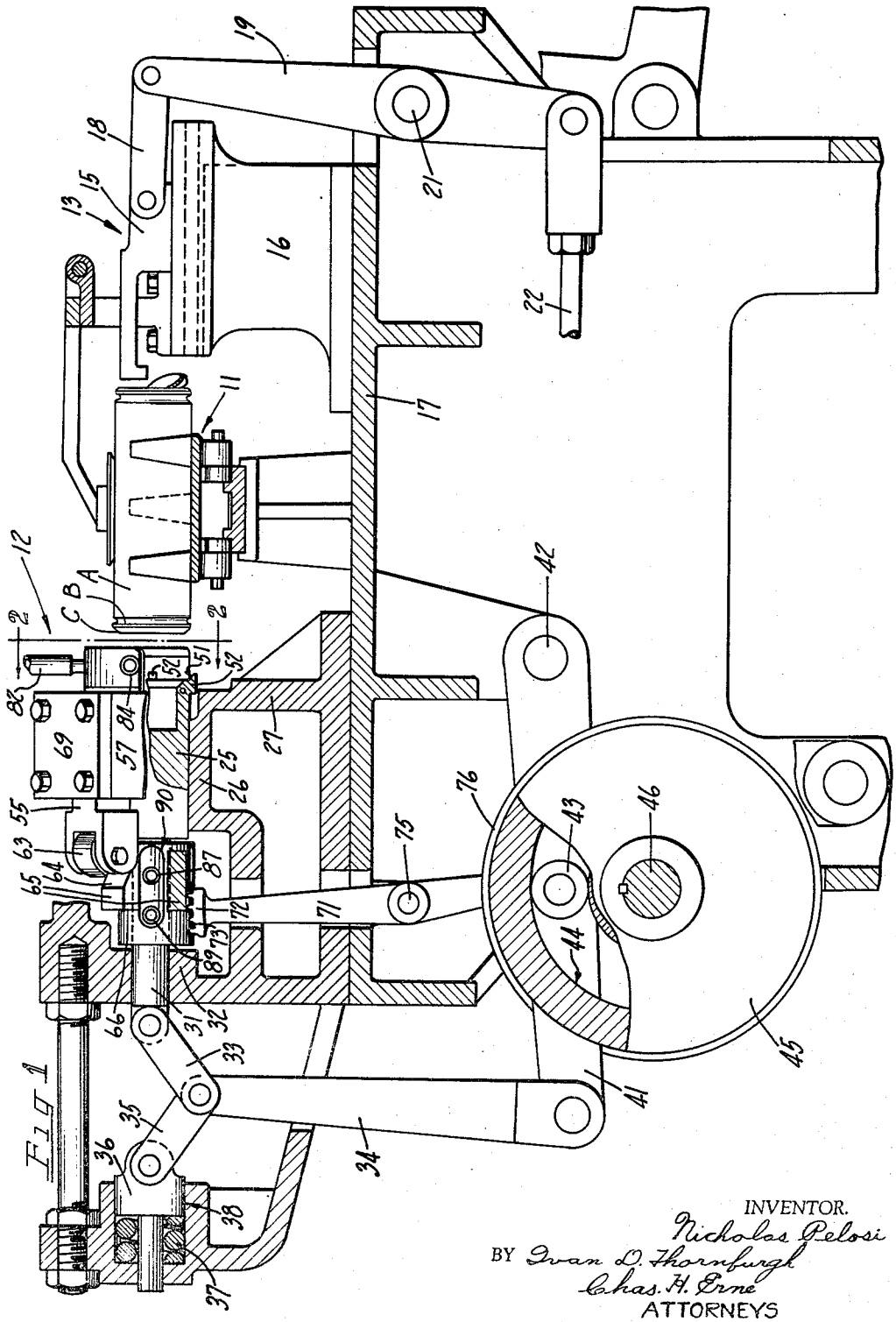


FIG 1

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Fig 5

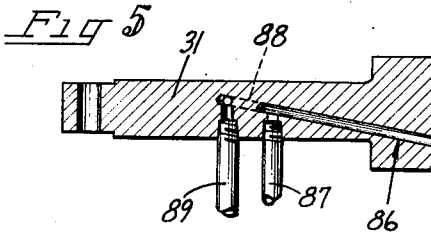


Fig 4

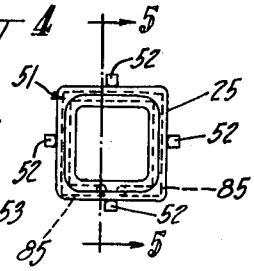


Fig 2

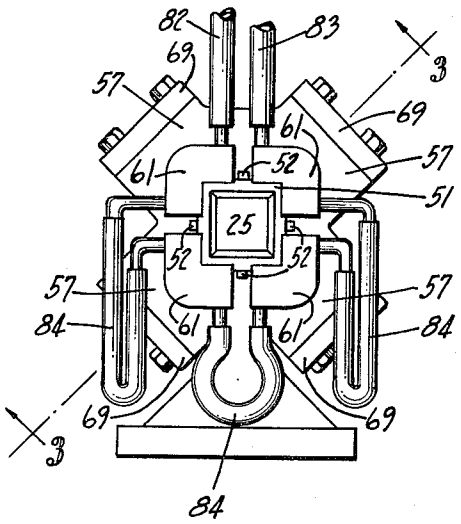
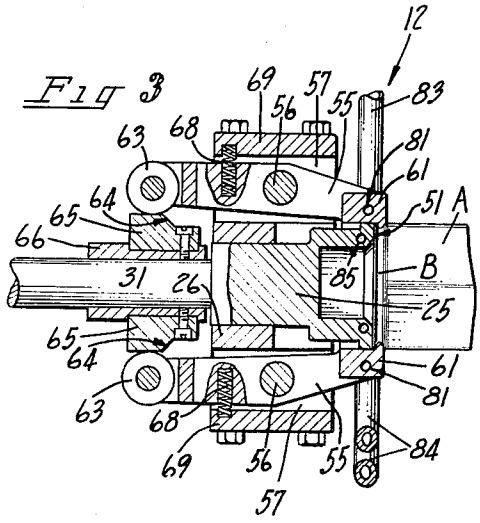


Fig 3



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2,264,330

UNITED STATES PATENT OFFICE

2,264,330

CAN END ASSEMBLING MACHINE

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6 Claims. (Cl. 93—55.1)

The present invention relates to can end assembling machines and the like and has particular reference to centering rectangular fibre cans in preparation for the sealing of a can end member to the can body. This is an improvement on the Can end assembling machine disclosed in United States Patent 2,200,276, issued May 14, 1940, to J. M. Hothersall et al.

The invention contemplates the sealing of fibre end members to rectangular fibre can bodies to produce containers or cans of the character disclosed in United States Patent 2,085,979, issued July 6, 1937, to J. M. Hothersall. The invention further contemplates a cooled sealing mechanism which centers the can relative to the sealing head while sealing the can end member in place.

An object therefore of the invention is the provision in a can end assembling machine of devices which center or bring the can into alignment with sealing devices so that the end member will be sealed in proper position on the can.

Another object is the provision of such a can sealing and centering device wherein the device is maintained in a cooled condition so that adhesive from cans which are preferably sealed when in a heated condition will be prevented from collecting on the sealing device parts.

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 transverse sectional view of the sealing station of a can end assembling machine embodying the instant invention, with parts broken away;

Fig. 2 is a front elevation of the can sealing device as taken substantially along a vertical plane indicated by the line 2—2 in Fig. 1, with parts broken away;

Fig. 3 is a sectional view taken substantially along the line 3—3 in Fig. 2 and showing a can in place for the sealing operation, with parts broken away;

Fig. 4 is a front elevation of a sealing punch used in the sealing device; and

Fig. 5 is a longitudinal section of the punch as taken substantially along the line 5—5 in Fig. 4.

As a preferred embodiment of the instant invention the drawings illustrate the principal parts of the can sealing station of the can end assembling machine disclosed in the above mentioned Hothersall Patent 2,200,276. In such a machine the cans to be operated upon are preferably of square cross section and include a tubular can body A (Fig. 1) having an inwardly extending shoulder bead B which sets off a straight flange C which surrounds the body.

The end member is preferably inserted within the body in engagement with the shoulder bead B and the flange C is folded over in overlapping relation to the outside of the end member, the flange along each flat side of the body being disposed at an angle to the end member. The flange and the end member further carry a marginal band of thermoplastic adhesive which is heated to a tacky condition prior to the sealing operation. It is in this condition that the cans to be sealed are brought to the sealing station of the machine.

The cans to be sealed are preferably advanced through the machine in a step-by-step or intermittent motion and in a horizontal position by a conveyor 11. This conveyor is intermittently actuated in any suitable manner in time with the other moving parts of the machine and preferably in the manner disclosed in the Hothersall Patent 2,200,276.

During its travel through the machine a can is brought to rest at the sealing station where the end to be sealed is adjacent a sealing device generally indicated by the numeral 12. The opposite end of the can is adjacent a pusher device 13.

The pusher device includes a slide 15 which is carried in a bracket 16 secured to the top of a frame 17 which constitutes the main frame of the machine. One end of the slide is connected to a link 18 which is attached to the upper end of a lever 19 mounted on a pivot pin 21 secured in the frame 17. The lower end of the lever is connected to an actuating link 22 which may be reciprocated in any suitable manner in time with the other moving parts of the machine.

Hence as the actuating link 22 rocks the lever 19 in one direction, it moves the slide 15 against the can and thereupon shifts the can transversely of the conveyor 11 and pushes the end of the can to be sealed into the sealing device 12.

The sealing device 12 includes a horizontally movable head or punch 25 (Figs. 1, 2, 3, 4 and 5) which slides in a bearing 26 formed in a bracket 27 bolted to the main frame 17. This punch is moved toward and away from the end of the can to be sealed. For this purpose the outer end of the punch is formed with a stem 31 which is carried in a bearing 32 in the bracket 27 and the outer end of the stem is connected by a link 33

to a vertical arm 34. A second toggle link 35 is connected between the arm and a cushion plunger 36 backed up by a compression spring 37 and disposed in a recess 38 in the bracket 27.

The lower end of the arm 34 is connected to a cam lever 41 which is mounted on a pivot pin 42 secured in the machine frame 17. The cam arm carries a cam roller 43 which operates in a cam groove 44 of a face cam 45 keyed to a shaft 46 journaled in suitable bearings formed in the machine frame. The shaft may be rotated in any suitable manner in time with the other moving parts of the machine. Rotation of the shaft rocks the cam lever 41 and thus shifts the arm 34 and toggle links 33, 35 in the proper direction to force the sealing punch toward the can.

The punch 25 is preferably square in cross section and its inner end is hollow. This hollow end terminates in a flat sealing face 51. Adjacent the sealing face the punch is formed with a plurality of centering lugs 52. There are preferably four of these lugs located one adjacent each side of the square punch. The lugs have a tapered inner surface 53 and the distance between opposite lugs at the base of the taper is equal to the outside dimension of the end of the can to be sealed.

Hence as the sealing punch 25 moves toward the can, one or more of the tapered surfaces 53 of the lugs 52 engage against the peripheral edge of the can end, i. e., the outer edge of the inclined flange C while the can is still in the conveyor 11. This shifts the can into alignment with the flat sealing face of the punch.

While the can is thus being properly centered relative to the sealing punch 25, can holding elements are moved into position to hold the centered can against displacement. These holding elements include a plurality of levers 55 (Figs. 1 and 3), preferably four in number and these levers are located one adjacent each corner of the centered can. These levers are mounted on pivot pins 56 carried in housing blocks 57 formed as a part of the bracket 27.

The inner ends of the levers are formed with right angle jaws 61 which are shaped to fit around the corners of the can and to extend into and support the shoulder bead B in the can. In their normal position, the jaws are spread apart and are spaced from the can.

The outer ends of the levers 55 carry cam rollers 63 which engage against inclined cam surfaces 64 of block cams 65 secured in a sleeve 66 which slides on the stem 31 of the punch 25. Compression springs 68 interposed between the levers 55 and cover plates 69 on the housing blocks 57 keep the cam rollers in engagement with the cam blocks.

The sleeve 66 is shifted along the stem 31 by a lever 71 (Fig. 1) formed with a segment gear 72 which meshes with rack teeth 73 cut in the sleeve. The lever is mounted on a pivot pin 75 carried in the main frame 17 and the lower end of the lever carries a cam roller which operates in a face cam 76 mounted on the shaft 46.

Hence the rotating shaft 46 and cam 76 carried thereon rock the lever 71 and through its segment gear 72 and the rack teeth 73 shift the sleeve 66 on the punch stem 31. When the sleeve moves toward the can the block cams 65 force the outer ends of the levers 55 outwardly and rock the levers so that the jaws 61 move in around the can and engage in its shoulder bead B.

This movement of the jaws 61 is effected near the end of the can centering operation and as the sealing punch 25 is moving toward the can, the movement of the jaws being independent of the movement of the punch. The can centering and supporting operations are completed at the same time and the moving punch immediately comes into contact with the can flange C and immediately thereafter forces the flange home against the can end member. The tacky adhesive provides the bond which permanently secures the flange to the end member. This completes the sealing of the can.

After such a sealing operation the punch moves away from the can and the sleeve 66 is shifted in the same direction to release the can supporting jaws 61. The freed and sealed can is thereupon withdrawn from the sealing head and returned to its original position in the conveyor so that it may be further advanced and finally discharged from the machine.

In order to prevent the tacky adhesive from collecting on the sealing head parts and to quicken the setting and hardening of the adhesive on the sealed can, the holding jaws 61 and the punch 25 are maintained in a cooled condition. This cooling is preferably effected by circulating a cooling medium such as cold water, brine or the like through the parts to be cooled.

In the holding jaws 61 the cooling medium is circulated through passageways 81 (Fig. 3) which are formed in the jaws and which are in communication with an inlet pipe 82, an outlet pipe 83, and connecting pipes 84 which connect individual passageways of the different jaws. The cooling medium thus enters one jaw, circulates through it and through all the other jaws, and then leaves by way of the outlet pipe 83. The inlet pipe 82 may lead from any suitable source of cooling medium and the outlet pipe 83 may return to this source or may lead to any suitable place of deposit for the cooling medium.

In the punch 25, there is a cooling passageway 85 (Figs. 4 and 5) which is disposed adjacent the flat sealing face 51 and which extends around the punch. One end of this passageway communicates with a conduit 86 which extends back into the punch stem 31 and which connects with an inlet pipe 87 threaded into the stem. The other end of the passageway 85 communicates with a similar conduit 88 which connects with an outlet pipe 89 threaded into the punch stem. Cooling medium circulated through these conduits and passageway keeps the face 51 of the punch in the desired cooled condition.

The inlet and outlet pipes extend through a slot 90 (Fig. 1) formed in the sleeve 66 and may connect with the inlet and outlet pipes 82, 83 of the jaws 61 and may thus lead from the same source of cooling medium and the same place of discharge or may be connected with a separate source of cooling medium and a place of discharge as desired.

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 an apparatus for securing a can end in inserted position within a fibre can body having an inwardly extending shoulder against which

the can end is positioned and having a partially folded flange overlapping the inserted can end, the combination of a sealing head movable toward and away from an end of the can body to be sealed, means adjacent said sealing head for centralizing the end of the can body relative to the sealing head to accurately locate the body for the sealing operation, devices movable independently of said sealing head and engageable with said can body shoulder for holding the located can body in position while the sealing head effects the sealing operation by pressing home the partially folded body flange against the can end, and means for successively and independently moving said holding devices and said sealing head into operative engagement with a said can body to be sealed.

2. In an apparatus for securing a can end in inserted position within a fibre can body having an inwardly extending shoulder against which the can end is positioned and having a partially folded flange overlapping the inserted can end, the combination of a sealing head movable toward and away from an end of the can body to be sealed, means on said sealing head and movable therewith for engaging and centralizing the can body relative to the head when the latter moves toward the body for pressing home the partially folded body flange against the can end, devices operable independently of said head for engaging against the body shoulder to back it up and to hold the can body against displacement during the sealing operation, and means for successively and independently moving said holding devices and said sealing head into operative engagement with a said can body to be sealed.

3. In an apparatus for securing can ends in inserted position within a fibre can body having an inwardly extending shoulder against which the can end is positioned and having a partially folded flange overlapping the inserted can end, the combination of a sealing head movable toward and away from an end of the can body to be sealed, said sealing head having a flat sealing surface adapted to engage the partially folded body flange and press it home against the can end, a plurality of tapered centralizing elements on said head and surrounding its sealing surface for engaging and centralizing the can body relative to the head when the latter moves toward the body, devices movable into engagement with said can body shoulder for holding the located can body in position while the sealing head effects the sealing operation, and means for successively and independently moving said holding devices and said sealing head into operative engagement with a said can body to be sealed.

4. In an apparatus for securing a can end in inserted position within a fibre can body having an inwardly extending shoulder against which the can end is positioned and having a partially folded flange overlapping the inserted can end, the combination of a sealing head movable toward and away from an end of the can body to be sealed, means on said sealing head and movable therewith for engaging and centralizing the can body relative to the head when the latter moves toward the body for pressing home the partially folded body flange against the can end, a plurality of pivotally mounted jaws surrounding said sealing head for engaging against the body shoulder to hold the centralized can body against displacement and to back up the body shoulder during the sealing operation, a sleeve movable on said sealing head, cams on said sleeve for actuating said jaws, and means for actuating said sleeve independently of the head and in timed relation to said head for bringing said jaws into holding position after the can body has been centralized but just prior to the sealing operation.

5. In an apparatus for securing a can end in inserted position within a fibre can body having an inwardly extending shoulder against which the can end is positioned and having a partially folded flange overlapping the inserted can end, the combination of a sealing head movable toward and away from an end of the can body to be sealed, said sealing head having a flat sealing surface adapted to engage the partially folded body flange and press it home against the can end, said sealing head also having a channel disposed adjacent its flat sealing surface through which a cooling medium is circulated to maintain the surface in a cooled condition when heated cans are being sealed, a plurality of tapered centralizing elements on said head and surrounding its cooled sealing surface for engaging and centralizing the can body relative to the head when the latter moves toward the body, a plurality of pivotally mounted jaws surrounding said sealing head and engageable with said can body shoulder to hold the centralized can body against displacement and to back up the body shoulder during a sealing operation, and means for successively and independently moving said holding devices and said sealing head into operative engagement with a said can body to be seated.

6. In an apparatus for securing a can end in inserted position within a fibre can body having an inwardly extending shoulder against which the can end is positioned and having a partially folded flange overlapping the inserted can end, the combination of a sealing head movable toward and away from an end of the can body to be sealed, said sealing head having a flat sealing surface adapted to engage the partially folded body flange and press it home against the can end, a plurality of tapered centralizing elements on said head and surrounding its sealing surface for engaging and centralizing the can body relative to the head when the latter moves toward the body, jaw devices movable into engagement with said cam body shoulder for holding the located can body in position while the sealing head effects the sealing operation, means for maintaining said sealing surface and said jaw devices in a cooled condition when heated cans are being sealed, and means for successively and independently moving said jaw devices and said sealing head into operative engagement with a said can body to be sealed.

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