Dec. 9, 1941. J. H. MURCH 2,265,187

CAN BODYMAKER

Filed Dec. 16, 1939 2 Sheets-Sheet 1

Fig 1

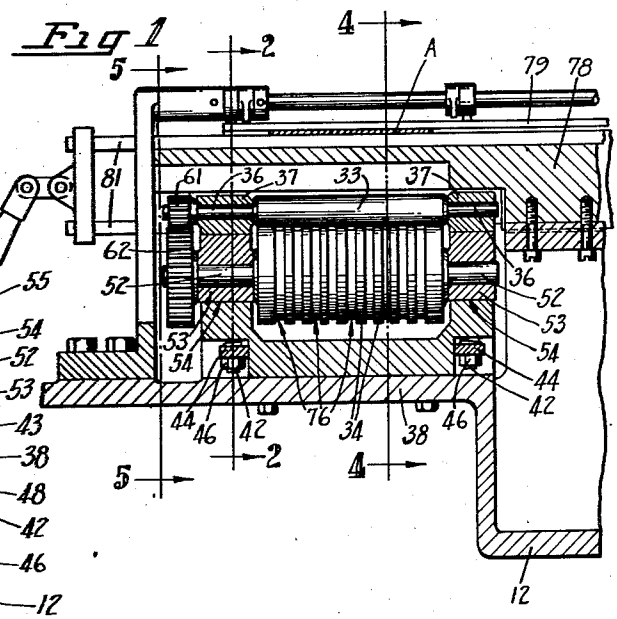


Fig 2

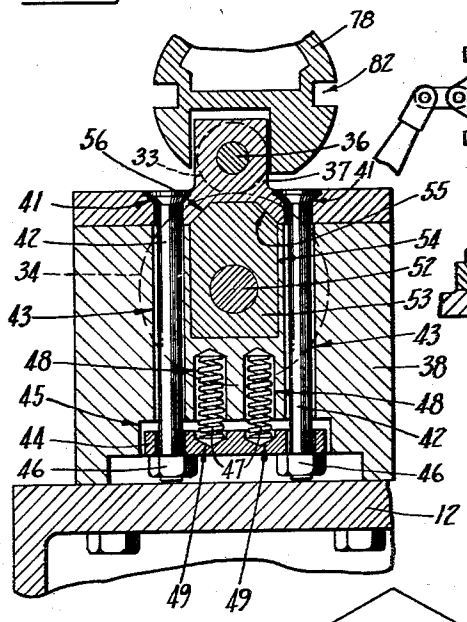
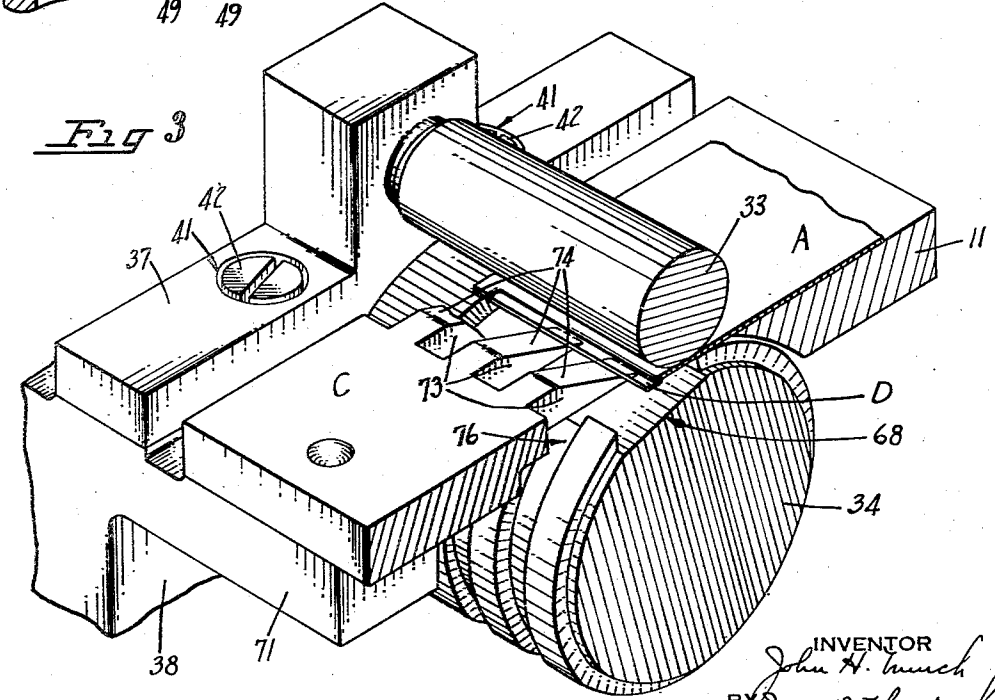


Fig 3



INVENTOR
John H. Murch
BY Brown, Thornburgh & Esche
ATTORNEYS

Dec. 9, 1941. J. H. MURCH 2,265,187

CAN BODYMAKER

Filed Dec. 16, 1939 2 Sheets-Sheet 2

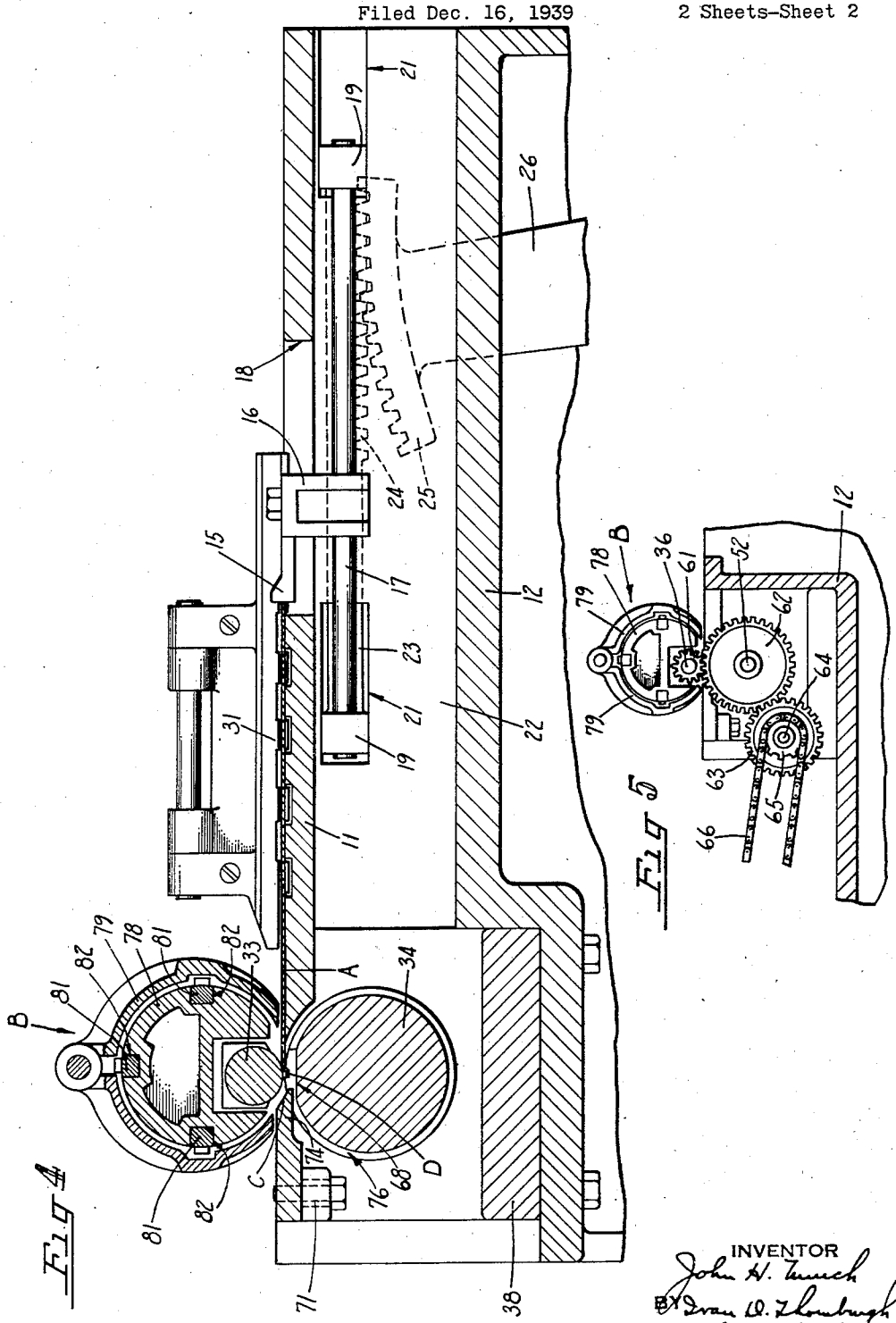


Fig 4

Fig 5

INVENTOR
John H. Murch
BY Evan D. Throughgh
Charles H. Cole
ATTORNEYS

Patented Dec. 9, 1941 2,265,187

UNITED STATES PATENT OFFICE

2,265,187

CAN BODYMAKER

John H. Murch, East Orange, N. J., assignor to American Can Company, New York, N. Y., a corporation of New Jersey

Application December 16, 1939, Serial No. 309,660

2 Claims. (Cl. 153—32)

The present invention relates to can body making machines and has particular reference to a curling or forming device for cylindrical can bodies having offset side seams adapted to be welded.

In the manufacture of can bodies in which the side seams are welded it has been found that a stronger seam is produced when the central portion of one of the side seam edges of the body blank from which the body is produced is offset, i. e., bent at an angle to the plane of the blank and thence extended parallel therewith thus providing a step extending the major length of the seam. The creation of the offset is preferably done while the body blank is in the flat. Where the body blank is formed into a cylindrical body shape by passing the flat blank through a roller curling or forming device, considerable difficulty has been encountered in preventing the offset from being ironed out flat during the forming operation.

The instant invention contemplates overcoming this difficulty by providing a curling or forming device with a relieved feeding roller to permit the offset portion of the body blank to readily pass through the device without being ironed out.

An object, therefore, of the invention is the provision in a machine for making cylindrical can bodies having an offset side seam, of a body forming device having a relieved feed roller adapted to receive the offset portion of the blank while being advanced so that it will be protected against deformation during forming of the blank into can body shape.

Another object of the invention is the provision in such a forming device of an improved blank feeding roller which permits of positioning the body curling or shaping element close to the line of feeding contact between blank and roller and below the feeding surface of the roller so that feeding rollers of large diameter dimensions may be readily used.

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 longitudinal sectional view of a portion of the body forming or shaping station of a can body making machine embodying the instant invention, with parts broken away;

Fig. 2 is an enlarged transverse sectional view taken substantially along the line 2—2 in Fig. 1, with parts broken away;

Fig. 3 is a greatly enlarged perspective view showing details of the body curling or forming device, with parts broken away and other parts shown in section; and

Figs. 4 and 5 are transverse sectional views taken substantially along the respective lines 4—4 and 5—5 in Fig. 1, Fig. 4 being drawn on an enlarged scale.

As a preferred embodiment of the instant invention the drawings illustrate principal parts of a cylindrical can body forming machine of the character disclosed in United States Patent 2,047,964, issued July 21, 1936, to J. M. Hothersall on Electric welding. In such a machine flat can body blanks A are advanced endwise into the grip of a pair of feeding rollers of a forming or curling device B which feeds the blank against a deflector element or forming block C. The deflector element curls the blank into cylindrical can body shape after which the side seam edges are brought together in overlapping fashion and are united by welding to produce the completed can body.

In the instant invention the flat can body blanks A (Figs. 3 and 4) to be formed into can bodies, are preferably of the character having an offset portion D extending along one side seam edge of the blank. Such blanks are fed in timed order onto a supporting table 11 formed as a part of a frame 12 which constitutes the main frame of the machine.

While on the table 11 the blanks A are advanced transversely thereof toward the forming device B by a feed dog 15 (Fig. 4) which is bolted to a block 16 mounted on a feed bar 17. The feed bar is located below the table and the block 16 and the feed dog 15 carried thereon extend up through an opening 18 in the table in order to engage behind a blank to be fed. The ends of the feed bar 17 are secured in lugs 19 which operate in slideways 21 formed in an upright web section 22 of the frame 12. The lugs are formed on a rack bar 23 having depending rack teeth 24 which mesh with a gear segment 25 of an operating arm 26. This arm is rocked by any suitable means operating in time with the other moving parts of the machine.

When the arm 26 rocks toward the left as viewed in Fig. 4 it shifts the feed bar 17 in the same direction. Thus the feed dog 15 carried thereon engages behind a blank A placed on the table 11 and feeds the blank into the can body forming device B. A removable plate 31 dis-

posed above the table 11 prevents upward displacement of the blank during this feeding operation.

The body forming device B includes a pair of cooperating upper and lower feed rollers 33, 34 (Figs. 1, 2, 3 and 4) which are disposed adjacent the table 11 so that the body blanks A may be readily fed into position between them. The upper roller 33, which also functions as a pressure roller, is formed with trunnions 36 which are journaled in bearing blocks 57 carried on top of a bracket 38 bolted to the main frame 12.

The upper roller 33 is maintained in frictional and yieldable engagement with the lower roller 34 by pressure elements connected with each of the bearing blocks 37 as will now be described. Each bearing block is formed with a pair of spaced chamfered holes 41 in which the heads of long bolts 42 are disposed. The bolts extend down through clearance holes 43 in the bracket 38 and at their lower ends they project through a plate 44. The plate is located in a recess 45 formed in the bottom of the bracket. Nuts 46 on the ends of the bolts hold the plate in place. A downward pressure is exerted on the plate by a pair of compression springs 47 which are interposed between the bracket and the plate. These springs are located in bores 48 in the bracket and seats 49 formed in the plate.

The lower feed roller 34 is formed with trunnions 52 which are journaled in rectangular shaped bearing blocks 53 carried in tight fitting slots 54 formed in the bracket 38. These bearing blocks extend above the top of the bracket and are formed with beveled surfaces 55 which cooperate with similar surfaces 56 formed in the upper roller bearing blocks 37 to maintain the latter in a centralized position on the bracket 38.

The pressure and feed rollers 33, 34 are constantly rotated in time with the advancement of the body blank A by a pair of meshing spur gears 61, 62 (Figs. 1 and 5). Gear 61 is mounted on one of the trunnions of the roller 33, while gear 62 is carried on a trunnion of the roller 34. The gear 62 also meshes with a driving gear 63 which is mounted on a short drive shaft 64 carried in suitable bearings formed in the main frame 12. The shaft carries a driving sprocket 65 which is rotated by a chain 66. The chain is actuated by any suitable means operating in time with the other moving parts of the machine.

Thus when a blank A is advanced into the forming device B the forward or offset edge D of the blank is pushed into position between the rotating feeding rollers 33, 34. In order to prevent ironing out the offset portion D of the blank when the latter enters between the rollers, the lower roller 34 is formed with a longitudinal clearance recess 68 (Figs. 3 and 4) in which the offset is received.

It is for this purpose that the roller 34 is rotated in time with the advancement of the blank by the feed dog 15. Such synchronism brings the roller recess 68 into position adjacent the upper feed roller 33 at the proper time so that the offset edge D of the blank will readily enter the recess between the rollers and thereby avoid having any pressure exerted upon it. To make this timing effective the lower roller 34 is preferably formed with a circumferential surface slightly greater than the length of the body blank being operated upon.

In this initial feeding step the feed dog 15, as it propels the blank, is in time with the peripheral speed of the feeding roller 34. The offset edge D thus passes into its clearance recess 68, safely advancing beyond the center line of the rollers. With continued rotation of the feed rollers the outer surface of the lower roller adjacent its clearance recess is thus brought into engagement with the blank and presses the blank upwardly against the feed and pressure roller 33. This brings the blank into the grip of the rollers and accordingly the blank is fed forward by them. It is this feeding action which propels the blank against the forming block C.

The can body forming block C extends nearly the full length of the feed roller 34 and is adjustably bolted in position adjacent the roller to lugs 71 (Figs. 3 and 4) which extend out from the bracket 38. The inner edge of the block is formed with a plurality of spaced and parallel blank deflecting fingers or elements 73 which extend inwardly toward the line of contact of the blank feed rollers 33, 34. These fingers are formed with beveled deflecting surfaces indicated by the numeral 74.

In setting the forming block C, it is adjusted so that the inner ends of the deflecting fingers will be slightly below the level of the offset edge D of the blank when the latter is first received in the roller clearance recess 68, as clearly shown in Figs. 3 and 4. To permit such a setting the lower feed roller 34 is formed with a plurality of spaced and parallel annular grooves 76 (see also Fig. 1) into which the deflecting fingers extend. These grooves permit vertical adjustment of the deflecting fingers to a position below the outer surface of the feed roller and also horizontal adjustment to the feed contact line of the rollers if desired.

Thus when the feed rollers 33, 34 grip the blank A and feed it forward, they force the blank endwise against the beveled surfaces 74 of the deflecting fingers 73. It is this action that bends or curls the blank into its desired cylindrical can body shape without distorting the offset side seam edge of the blank.

As the curled or formed blank comes off the forming block C, it passes around a horizontal horn or mandrel 78 (Figs. 1, 2 and 4) which is bolted to the main frame 12. A pair of removable side guides 79 extending around and longitudinally of the horn and in spaced relation therewith, confine the shaped blank against displacement from the horn. These partially formed bodies thus positioned on the horn are immediately propelled therealong for further operations by feed bars 81 which are disposed in grooves 82 formed in the horn. These bars are reciprocated in any suitable manner in time with the other moving parts of the machine. Subsequent operations upon the partialy formed can body as it is propelled along the horn form no part of the instant invention and therefore a description of these operations will be omitted.

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 machine for making cylindrical can bodies having offset side seams, the combination

of a pair of cooperating feeding rollers for feeding a flat can body blank having a leading offset side seam edge, a said roller having a clearance recess to receive the offset side seam edge of the blank to prevent its being flattened during feeding, one of said rollers having a circumferential groove, and a deflector element located adjacent said feeding rollers and having a deflecting finger extending into the said groove in said roller, a portion of said finger being disposed below the feed line of the rollers for engagement by the fed blank passing between the rollers and for deflecting and bending the blank into cylindrical can body shape by first engaging said offset edge.

2. In a machine for making cylindrical can bodies having offset side seams, the combination of a pair of cooperating feeding and pressure rollers for feeding a flat can body blank having a leading offset side seam edge, means for yieldably and bodily urging said pressure roller towards said feeding roller, said feeding roller having a clearance recess therein to receive the offset side seam edge of the blank to prevent its being flattened during feeding, said feeding roller also having a plurality of circumferential grooves, and an adjustable deflector element located adjacent said rollers and having a plurality of deflecting fingers extending into the said grooves in said feeding roller, a portion of said fingers being disposed below the feed line of the rollers for engagement by the fed blank passing between the rollers and for deflecting and bending the blank into cylindrical can body shape by first engaging said offset edge.

JOHN H. MURCH.