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J. D. CZARNECKI

2,741,291

PREFLANGING MECHANISM FOR SIDE SEAMED CAN BODIES

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3 Sheets-Sheet 1

Fig. 1

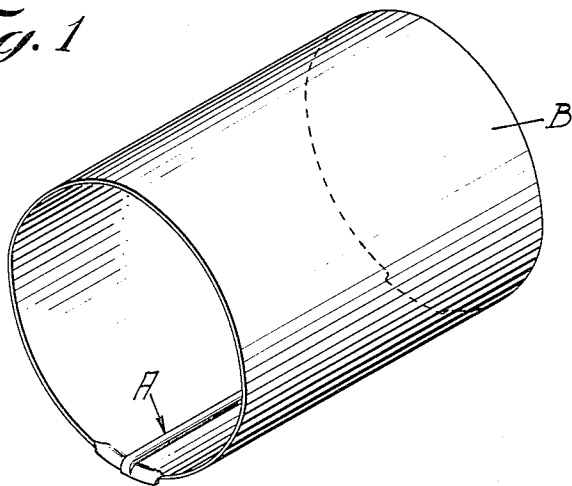
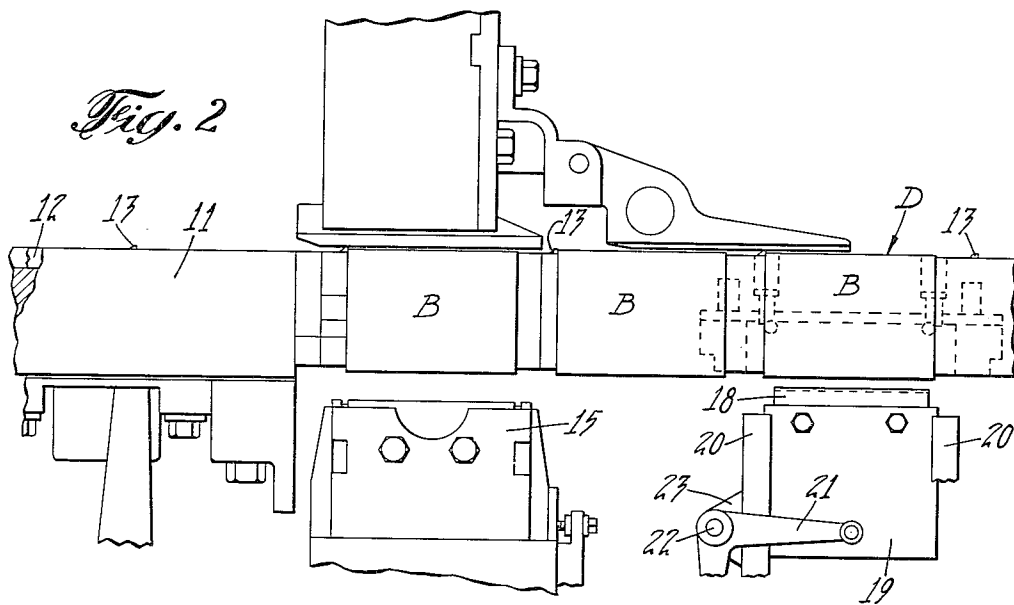


Fig. 2



INVENTOR.

JOHN D. CZARNECKI

BY *Charles H. Erne*
Leland R. McCann
George W. Reiber
ATTORNEYS

April 10, 1956

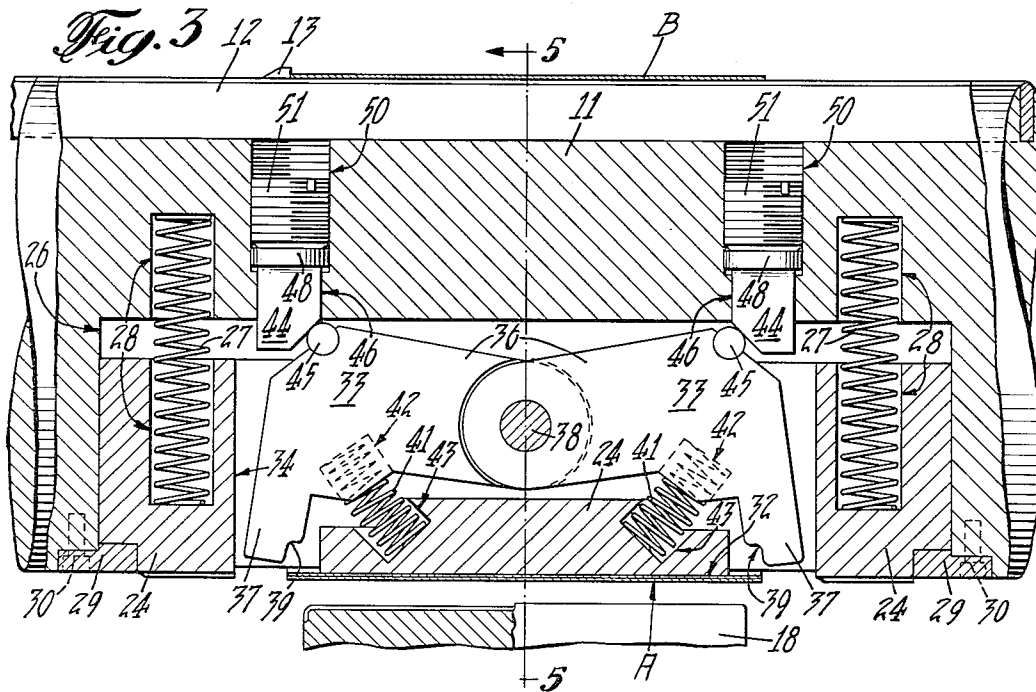
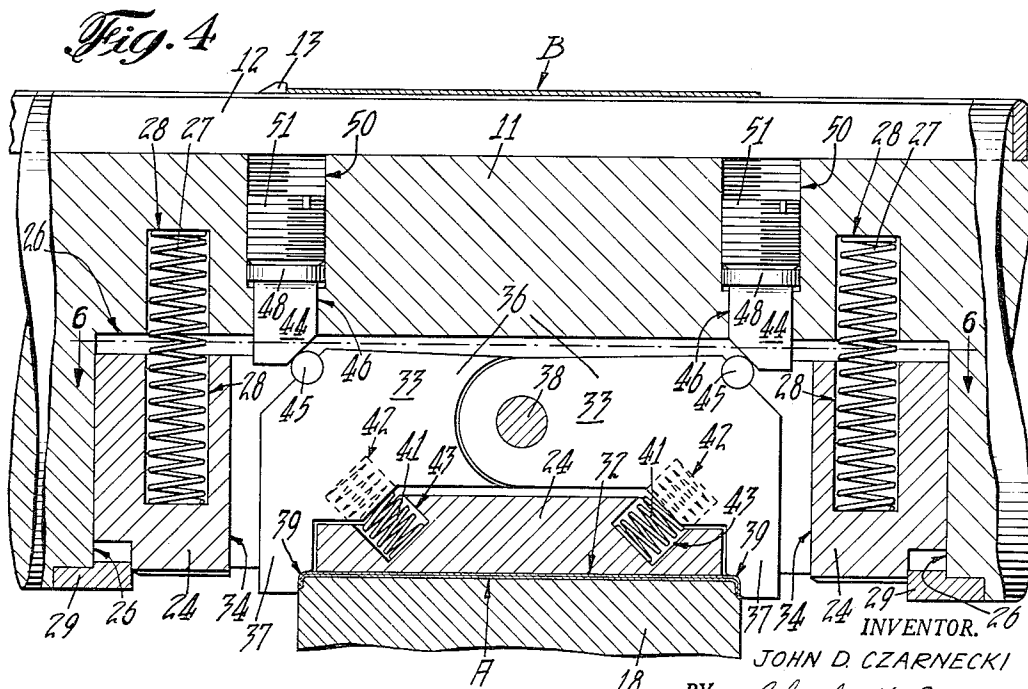
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INVENTOR. 26
JOHN D. CZARNECKI
BY Charles H. Erne
Leland R. McCann
George W. Reiber
ATTORNEYS

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Fig. 5

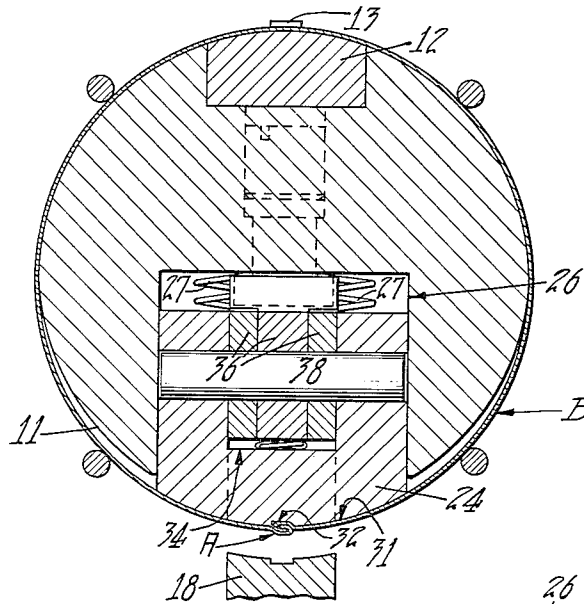


Fig. 6

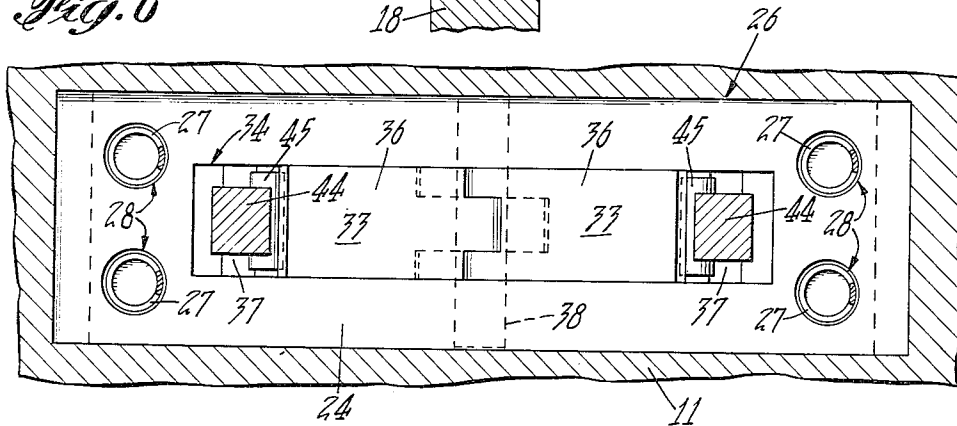
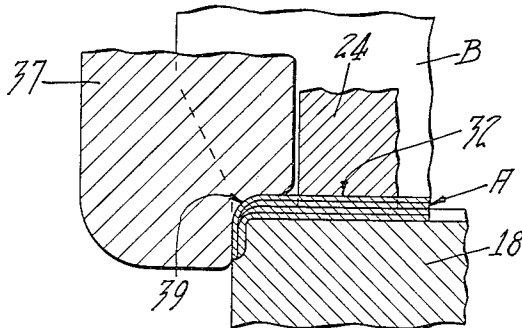


Fig. 7



INVENTOR.
JOHN D. CZARNECKI
BY Charles H. Ene
Leland R. McCann
George W. Reiber
ATTORNEYS

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PREFLANGING MECHANISM FOR SIDE SEAMED CAN BODIES

John D. Czarnecki, Oak Park, Ill., assignor to American Can Company, New York, N. Y., a corporation of New Jersey

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7 Claims. (Cl. 153—44)

The present invention relates to can or container body making machines and has particular reference to an improved mechanism for preflanging the end edge portions of sheet metal can bodies in the side seam area.

In applying end closures to can bodies having their end edges flanged, difficulty has been encountered in the side seam area of the flanges. This is especially true in bodies having cemented side seams wherein two thicknesses of metal, and sometimes, as in the case of full lock seams, four thicknesses or layers, make up a seam. In flanging the end edges of the can bodies prior to the application of flanged end closures thereto frequent failure of all of the thicknesses or layers of metal at the ends of the side seam to take proper curvature has resulted in bulky seams and even fractures and has caused leaks where the film of sealing cement or compound between the layers of the seam is disturbed. This is especially true in certain die flanges where no provision is made for holding all of the side seam thicknesses together during the flanging operation. In such flanges the inner layer of metal of the side seams usually follows the shape of the flanging head while the rest of the layers tend to spread apart.

An object of the instant invention therefore is the provision of an improved can body preflanging mechanism in the bodymaker adapted to overcome these difficulties wherein the edge of a can body at the side seam area is partially flanged while the side seam of the body is supported in clamped position so as to control the curvature of the layers of sheet material in the seam portion of the flange and thereby insure uniform prebending of the edge portion of the side seam.

Another object is the provision of such a preflanging mechanism which may be readily incorporated in the forming horn or mandrel of conventional can body making machines without interrupting or altering any of the machine operations.

Another object is the provision of such a preflanging mechanism wherein the flange forming tools can be adjusted for side seams of various thicknesses.

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 perspective view of a preflanged can body produced by the mechanism of the instant invention;

Fig. 2 is a side view portion of a can body making machine illustrating principal parts of the machine at the bumping station and embodying the preflanged mechanism of the instant invention parts, being broken away;

Figs. 3 and 4 are enlarged longitudinal sections of a portion of the mechanism shown in Fig. 2, the views showing certain of the parts in different positions as an incident to preflanging a can body;

Fig. 5 is a sectional view taken substantially along the lines 5—5 in Fig. 3;

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Fig. 6 is a sectional plan view taken substantially along the lines 6—6 in Fig. 4; and

Fig. 7 is an enlarged fragmentary sectional view of certain of the parts shown in Fig. 4 and a portion of a preflanged body.

As a preferred or exemplary embodiment of the instant invention the drawings illustrate a mechanism for preflanging conventional lock and lap side seams A (Figs. 1 and 7) of sheet metal tubular can bodies B. The can bodies are made from flat blanks on a conventional can body forming machine of the character disclosed in United States Patent 1,770,041 issued July 8, 1930 to John F. Peters on Roll Bodymaker.

A portion of such a machine is illustrated in Fig. 2 and comprises a stationary horn or mandrel 11 around which the flat blanks are formed and on which the formed bodies are supported during subsequent operations. The formed bodies are advanced along the horn 11 to the various working stations in a step-by-step or intermittent motion by a reciprocating feed bar 12 carrying spaced spring held feed dogs 13 (see also Figs. 3 and 4) which engage behind the end edges of the bodies. The can bodies are brought to rest at each station for the various operations preformed thereon as disclosed in the above mentioned Peters' patent. These stations include the conventional notching, edging, and bumping stations.

At the bumping station, shown in Fig. 2, the side seam hooks, formed at the edging station, are interengaged, the body expanded to proper size, and the interengaged hooks bumped together to close the body. The bumping operation is performed by a vertically reciprocable bumping hammer 15.

The preflanging of the can bodies B preferably is effected while the bodies are supported on the horn 11 and after they pass through the bumping station. For this purpose the feed bar 12 advances a bumped can body B into a preflanging station D (Fig. 2) disposed in spaced relation to the bumping station. At this station the can body is brought to rest with its side beam A longitudinally aligned with and above a vertically reciprocable seam support block, anvil, or pressure member 18 (Figs. 2, 3 and 4) preferably disposed under the horn 11 in spaced relation thereto. This anvil 18 is provided with a concave face having a curvature substantially equal to the outline of the can body and the face is formed with a longitudinal channel to receive and closely confine the portion of the side seam that projects beyond the outer face of the body. The anvil 18 is mounted in a vertical slide 19 which operates in a pair of spaced and parallel side guides 20 attached to the frame of the body making machine.

The slide 19 is reciprocated in time with the travel of the can bodies along the horn 11, in any suitable manner, such as for example by a bell crank 21 mounted on a pivot pin 22 carried in a boss 23 formed on one of the side guides 20. One end of the lever is pivotally secured to the slide 19 while the other end is actuated through a cam or other suitable device to move the slide up, through a body clamping stroke and thence down through a return stroke while the can body is at rest.

When the slide 19 moves through an up stroke, it forces the anvil 18 against the side seam A of the can body B at rest at the preflanging station and tightly clamps the seam against a yieldable clamp block or member 24 (Figs. 3, 4, 5, 6 and 7) located in the horn 11. While the seam is thus clamped against movement, the preflanging of the seam area, i. e., the ends of the seam at the top and bottom edges of the body, is effected. For this purpose the anvil 18 is provided with a length less than the length of the side seam A of the body, by an amount equal to the depth of the flanges to be formed on the ends of the seam. The anvil 18 is disposed in a central location be-

tween the ends of the can body so that the ends of the seam to be preflanged overhang the ends of the block as seen in Fig. 3.

The clamp block 24 preferably is made as a rectangular member which is disposed for vertical sliding movement in a recess 26 formed in the horn 11 and is backed up by a set of four compression springs 27 interposed between the clamp block and the upper portion of the horn 11 and housed in blind bores 28 formed in these parts adjacent the ends of the clamp block. The clamp block 24 is confined against displacement from the recess 26 under pressure of the springs 27 by inserts 29 which are seated in the bottom of the horn 11 in a flush relation to the outer face of the horn. The inserts are secured in place by any suitable means such as by screws 39 threadedly engaged in the horn 11 as shown in Fig. 3.

At the preflanging station D the bottom portion of the horn 11 is reduced in diameter as best shown in Fig. 5 to permit considerable clearance between the horn and the side seam portion of the can body. The bottom portion of the clamp block 24 depends below this reduced portion of the horn and is formed with a curved bottom face 31 (Fig. 5) which in the normal position of the clamp block against the inserts 29 as shown in Fig. 3 is flush with and provides a continuation of the unreduced or full bottom portion of the horn. A shallow longitudinal channel 32 is provided in this curved face of the clamp block to receive and closely confine the portion of the side seam A that projects beyond the inner surface of the can body and thus cooperates with the channel in the curved face of the anvil 18 to fully confine and clamp the side seam for its entire length excepting the lap portions of the seam which extend beyond the ends of the anvil.

Hence when the anvil 18 is moved upwardly towards the horn 11 through movement of the slide 19, the anvil 18 presses the side seam area of the can body B against the curved face 31 of the clamp block 24 and thus rigidly clamps and confines the side seam A in the channels with its lapped sections extending beyond the ends of the anvil. As the anvil 18 continues to move up, it forces the clamp block 24 upwardly into the horn 11 against the resistance of the compression springs 27. During this upward movement the clamped side seam A moves with the anvil and the clamp block, the sides of the body being flexed outwardly into the clearance space at the bottom of the mandrel as hereinbefore mentioned. It is to permit this body flexing action that the horn is provided with this reduced diameter portion. During this upward travel of the anvil 18 and the clamp block 24, the lapped portions of the seam A extending beyond the ends of the anvil are bent down against the ends of the anvil to form the initial or preflange on the body.

The preflanging of the body B is effected by a pair of oppositely disposed and pivotally mounted flange forming members or preflanging jaws or tools 33 which are located in a vertical opening or slot 34 formed in the clamp block 24. These preflanging jaws 33 are substantially L-shaped, being formed with substantially horizontal arms 36 and substantially vertical depending feet 37. The inner ends of the two horizontal arms 36 are mounted on a common pivot shaft 38 which extends transversely of the clamp block 24 and its opening 34 at substantially the middle of the opening with the ends of the shaft carried in the block and with the arms 36 extending in opposite directions. The depending feet 37 are disposed adjacent and extend down toward the ends of the anvil 18, but are wholly confined within the horn 11. These feet 37 are provided with vertically curved transverse preflanging faces 39 (Fig. 7) for engagement against the portions of the side seam A which overhang the anvil 18 and which are shaped to produce the desired curvature and transverse contour of the flange.

When the clamp block 24 is in its normal position as shown in Fig. 3 the depending feet 37 of the jaws 33 are held out of preflanging position within the horn 11

by a pair of compression springs 41 so as to permit the advancement of the can bodies B along the horn 11 into the preflanging station D. The springs 41 are disposed between the jaws 33 and the clamp block 24 in blind bores 42 and 43 formed in the depending feet 37 of the jaws 33 and the clamp block 24 respectively.

The compression springs 41 press the jaws 33 upwardly and outwardly against a pair of vertically disposed rectangular shaped stop pins 44 having tapered faces which engage against transverse horizontal cylindrical bearings 45 secured to the outer ends of the jaw arms 36. There is one pin 44 for each arm. The pins 44 are disposed in rectangular bores 46 formed in the upper portion of the horn 11 and are located adjacent the outer ends of the jaw arms 36. At their upper ends the pins 44 are formed with circular collars 48 which are disposed in enlarged threaded bores 50 which connect with the bores 46. Threadedly engaged in the bores 50 are a pair of adjusting screws 51 for vertically adjusting the position of the tapered bearing faces of the pins 44 to thereby control the amount of movement of the jaws 33.

As the clamp block 24 and the clamped side seam A on the can body B move up into the horn 11 under the force of the anvil 18, the cylindrical bearings 45 are held against the tapered faces of the stop pins 44 by the springs 41, and the jaws 33 rock in opposite directions on these bearings. During this rocking movement, the inner ends of the jaws oscillate on their common pivot shaft 38 and this action forces the feet 37 of the jaws inwardly toward the ends of the anvil 18. The curved faces 39 of these feet 37 are located in the feet to engage over the outer upper ends of the anvil 18 when the feet are in engagement therewith as best shown in Figs. 4 and 7.

Hence during the inward movement of the feet 37, the curved faces 39 engage against the lapped sections of the clamped side seam A extending beyond the ends of the anvil 18 and bend these overhanging sections downwardly and inwardly over and against the outer upper portions of the ends of the mandrel as shown in Fig. 7. The jaws 33 compress these bent portions of the side seam A against the ends of the anvil and thus produce a started flange or preflange of a width equal to the transverse length or width of the curved faces 39 on each end of the body. In such a manner of forming the preflange, the various layers or thicknesses of material in the seam are properly curved and tightly compressed to the desired amount.

Upon completion of the preflanging operation as shown in Fig. 4, the bell crank 21 rocks through a return movement and thus returns the slide 19 and anvil 18 to their original or normal positions as shown in Fig. 2. This action permits the springs 27 to lower the clamp block 24 to its normal position and the springs 41 to rock the preflanging jaws 33 out of the path of the advancement of the can bodies along the horn and thus the preflanged can body is released and completely free for discharge to any suitable place of deposit.

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 mechanism for preflanging the side seam area of can bodies, comprising in combination a horn for supporting a can body, an anvil adjacent said horn for supporting the side seam of said body with the ends of said seam extending beyond and overhanging the ends of said anvil, a clamp member slideably mounted in said horn, flange forming jaws pivotally mounted on said clamp member and extended toward the ends of said anvil for engaging against the overhanging portions of said seam,

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means for moving said anvil toward and away from said clamp member, and stop means in said horn and engaging against said flange forming jaws for pivoting said jaws, said clamp member being actuated by said anvil during said movement of the anvil toward the clamp member for camming said jaws along said stop means for pivoting said flange forming jaws toward the ends of said anvil for squeezing the overhanging edge portions of said seam toward and over said anvil to preflange the side seam area of said body.

2. A mechanism for preflanging the side seam area of can bodies, comprising in combination a horn for supporting a can body, an anvil adjacent said horn for supporting the side seam of said body with the ends of said seam extending beyond and overhanging the ends of said anvil, a clamp member slideably mounted in said horn, flange forming jaws pivotally mounted on said clamp member and extended towards the ends of said anvil for engaging against the overhanging portions of said seam, means for moving said anvil toward and away from said clamp member, stop means in said horn and engaging against said flange forming jaws for pivoting said jaws, and compression springs housed in said clamp member and said flange forming jaws for holding said jaws against said stop means, said clamp member being actuated by said anvil during said movement of the anvil toward the clamp member for camming said jaws along said stop means for pivoting said flange forming jaws toward the ends of said anvil for squeezing the overhanging edge portions of said seam toward and over said anvil to preflange the side seam area of said body.

3. A mechanism for preflanging the side seam area of can bodies, comprising in combination a horn for supporting a can body, an anvil beneath said horn for supporting the side seam of said body with the ends of said seam extending beyond and overhanging the ends of said anvil, a clamp member slideably mounted in said horn, flange forming jaws pivotally mounted on said clamp member and having depending foot sections disposed adjacent the ends of said anvil for engagement against the overhanging portions of said seam, means for moving said anvil toward and away from said clamp member, and stop means adjustably mounted in said horn for guiding said flange forming jaws, said clamp being actuated by said anvil during said movement of the anvil toward the clamp member for camming said jaws along said stop means for guiding the depending foot sections of said flange forming jaws toward said anvil for squeezing the overhanging edge portions of said seam toward and over the ends of said anvil to preflange the side seam area of said body.

4. A mechanism for preflanging the side seam area of can bodies, comprising in combination a horn for supporting a can body, an anvil adjacent said horn for supporting the side seam of said body with the ends of said seam extending beyond and overhanging the ends of said anvil, a clamp member slideably mounted in said horn, flange forming jaws pivotally mounted on said clamp member and having depending foot sections adjacent the ends of said anvil, said foot sections each having a flange forming face for engaging against the overhanging portions of said seam, means for moving said anvil toward and away from said clamp member, and stop means adjustably mounted in said horn for guiding said flange forming jaws, said clamp member being actuated by said anvil during said movement of the anvil toward the clamp member for camming said jaws along said stop means for guiding the flange forming face of the depending foot sections of said flange forming jaws toward said anvil for squeezing the overhanging edge portions of said seam toward and over the ends of said anvil to preflange the side seam area of said body.

5. A mechanism for preflanging the side seam area of can bodies, comprising in combination a horn for sup-

porting a can body, an anvil disposed beneath said horn for supporting the side seam of said body with the ends of said seam extending beyond and overhanging the ends of said anvil, a clamp member slideably mounted in said horn, a pair of oppositely disposed flange forming jaws mounted in said clamp member and having depending foot sections adjacent the ends of said anvil, said foot sections each having a flange forming face for engaging against the overhanging portions of said seam, a common pivot in said clamp member for said flange forming jaws, means for moving said anvil toward and away from said clamp member, and stop means adjustably mounted in said horn for guiding said flange forming jaws, compression springs housed in said clamp member and said flange forming jaws for holding said jaws yieldably against said stop means, said clamp member being actuated by said anvil during said movement of the anvil toward the clamp member for raising the pivot of said flange forming jaws for camming said jaws along said stop means for guiding the flange forming face of the depending foot sections of said flange forming jaws toward said anvil for squeezing the overhanging edge portions of said seam toward and over said anvil to preflange the side seam area of said body.

6. A mechanism for preflanging the side seam area of can bodies, comprising in combination, a horn for supporting a can body, an anvil adjacent said horn for supporting the side seam of said body with the ends of said seam extending beyond and overhanging the ends of said anvil, flange forming means disposed in said horn and mounted on pivot means disposed in said horn, said flange forming means being normally biased to retracted position in said horn and being movable around said pivot means from said retracted position toward the ends of said anvil for engaging against the overhanging portions of said seam, means for moving said anvil toward and away from said horn, and means associated with said flange forming means and movable by said anvil during its said movement toward said horn for moving said flange forming means around said pivot means toward the ends of said anvil for bending the overhanging edge portions of said seam toward and over the ends of said anvil to preflange the side seam area of said body.

7. A mechanism for preflanging the side seam area of can bodies, comprising in combination, a horn for supporting a can body, an anvil adjacent said horn for supporting the side seam of said body with the ends of said seam extending beyond and overhanging the ends of said anvil, a clamp member slideably mounted in said horn, and flange forming means including jaws pivotally mounted on said clamp member in said horn, the free ends of said jaws being pivotally movable toward the ends of said anvil for engaging against the overhanging portions of said seam, and means for moving said anvil toward and away from said horn, said clamp member being bodily movable by said anvil during said movement of the anvil toward said horn for pivoting said jaws to move their free ends toward the ends of said anvil for squeezing the overhanging edge portions of said seam toward and over the ends of said anvil to preflange the side seam area of said body.

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