must be provided to exhaust the air from the cup shaped blank **11** to prevent movement of the ram into the blank from causing the blank to be ruptured. For this reason, a longitudinally extending opening **104** is formed throughout the length of both portions of the punch member and then connecting screw. This opening **104** is connected to an opening **106** formed in the slide **56**. Opening **106** in turn is connected with a vertically extending opening **108** which connects with the lower surface of the slide **56**. If the machine were operated at a low rate the line **108** could simply serve as an exhaust to the atmosphere; however, because the machine is operated at an extremely high number of cycles per minute, line **108** is preferably connected through a flexible line **110** to a source of vacuum and a source of air pressure not shown. The control of air and vacuum through line **110** is accomplished in any convenient manner, such as for example, by solenoid valves actuated by a cam limit switch unit **111** driven from the main crankshaft **38**.

In operation, the valves are controlled so that as the punch member begins entering the can a vacuum is pulled on line **108** and, accordingly, on lines **104** to thereby exhaust the air from the can; however, after the finish of the working portion of the punch stroke the valves are operated to supply air under pressure through the same lines to assist in removing the formed can bodies from the ram.

IRONING AND DOMING ASSEMBLY D

The ironing and doming assembly D is best shown in FIGURES 10 and 11. This assembly functions in combination with the punch members **90** to form the cup-shaped can blanks **11** to their final desired form **11'**.

The portion of the assembly D which performs the ironing function includes a first ironing ring assembly **110** and a second ironing ring assembly **112**. Assemblies **110** and **112** are mounted in a common frame **114** which includes a horizontally extending base plate **116**. The base plate **116** is supported from inwardly extending brackets **118** which are welded to the side frame members **10** and **12**. The base plate is releasably connected to the brackets **118** by a plurality of screws **120**. This arrangement allows the ironing ring assemblies **110** and **112** to be readily removed from the machine as a unit for replacement or repair.

Referring specifically to ironing ring assembly **110** it is seen that the assembly includes a pair of ironing ring members **124** each adapted to cooperate with a separate one of punch members **90**. Each ring member **124** is identically formed and mounted. Consequently only one will be described in detail. As shown, ring member **124** is carried in a recess **126** formed in the left-hand portion **128** of support member **114**. The ring **124** has an extruding opening **130** formed centrally therein. The opening **130** is axially aligned with the path of movement of its respective punch member **90** and is of a diameter slightly larger than the desired finished diameter of the can body **11'**. As shown, the outer periphery of the ring member **124** is slightly smaller in diameter than the peripheral wall of the recess **126** and an O-ring **132** is received in an annular recess formed in the outer periphery of ring **124** to position the ring in the recess. This arrangement allows the ring to have some slight movement relative the ram so as to be somewhat self-centering.

The ring **124** is releasably retained in the recess by a retainer plate **134** which is connected to the support frame **114** by a plurality of screws **136**. The retainer plate **134** is of a two-part construction so as to provide an internal annular recess **140** to which lubricant is supplied. The lubricant is conducted from recess **140** to the exterior surface of the blank via a plurality of small openings **142**.

Referring now to assembly **112**, it is seen that the ironing ring portion of the assembly is generally the same as described with reference to assembly **110** and includes a pair of ironing rings **144** each adapted to cooperate with a separate one of punch members **90**. The rings are received in openings **146** formed in portion **148** of bracket **114**. Extending centrally through each of rings **144** is an extruding opening **150**. This opening is aligned with the path of movement of the respective punch member **90** and is of a diameter equal to the desired final diameter of the can body **11'**. Additionally, O-rings **152** extend in grooves formed in the outer periphery of the rings **144** so as to provide a degree of self-centering as described with reference to rings **124**. Rings **144** are retained in recesses **146** by retainer plates **154** connected to portion **148** of bracket **114** by a plurality of screws **156**. The retainer plates also include an annular lubricant receiving groove **160** which, through openings **162** supplies lubricant to the ironing ring assembly.

Positioned in recesses **168** formed in the opposite side of member **148** are stripping ring assemblies **170**. These assemblies function to remove the finished can bodies from the punch members **90** as the punches are reciprocated to the left as viewed in FIGURE 10. In particular, the two stripping ring assemblies **170** are formed in the same manner and each include a plurality of discrete ring sections **172** which are biased inwardly by a circumferentially extending garter spring **174**. The ring segments **172** are retained in their respective recess **168**, but permitted to have radial movement relative thereto by a circular retainer plate **176** connected to member **148** by a plurality of screws **178**.

Mounted at the right-hand end of the punches' path of movement is doming assembly **180**. This assembly is arranged to form the bottom wall of the can body to the desired final shape. Referring more specifically to FIGURE 8 it is seen that doming assembly **180** includes 2 doming units **182** each of which is aligned with a separate one of punch members **90**. Additionally, the doming units **182** are arranged for separate adjustment longitudinally of the path of movement of the rams by mechanism which will subsequently be described in detail; however, referring to FIGURE 10, it is seen that each of the units includes a doming member **184** which has an end surface **186** of a configuration desired to be imparted to the bottom wall of the can **11'**. Member **184** is connected by a plurality of cap screws **186** with a mounting sleeve **188**. The mounting sleeves **188** of the two respective doming units **182** are, as best shown in FIGURE 8, releasably connected by a plurality of screws **190** to independent support members **194** and **196**, respectively.

Referring again to FIGURE 10 it is seen that an ejector ring member **198** is positioned about each of the doming members **184**. This ejector ring is arranged so as to be slidable within the sleeve **188**. A plurality of rods **200** extend from the rear end of the ejector ring into engagement with a slide flange **202** carried on a stud **204** threadably connected to the rear end of the doming member **186**. A compression spring **206** surrounds stud **204** and functions to maintain a constant bias against the slide flange **202** to in turn bias the ejector ring **198** outwardly. Spring **206** is maintained in position by a washer and nut **208** and **210**, respectively.

Referring to FIGURE 11 which shows one of the punch members **90** at the rightward extent of its stroke, it is seen that at this time the can body **11'** is completely formed and the ejector ring has been force rightwardly against the bias of spring **206**. As the ram begins moving to the left, the outward bias against the ejector spring forces the can body **11'** away from the doming member **184**. Continued leftward movement of the ram causes the rear edge **186** of the can body **11'** to be engaged by the stripping ring assembly **170**. This, in combination with the pressurized air supplied through line **104**, causes the can to be stripped or removed from the punch. The can is then received on the discharge mechanism F and discharged from the machine.

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WALL IRONING MACHINE

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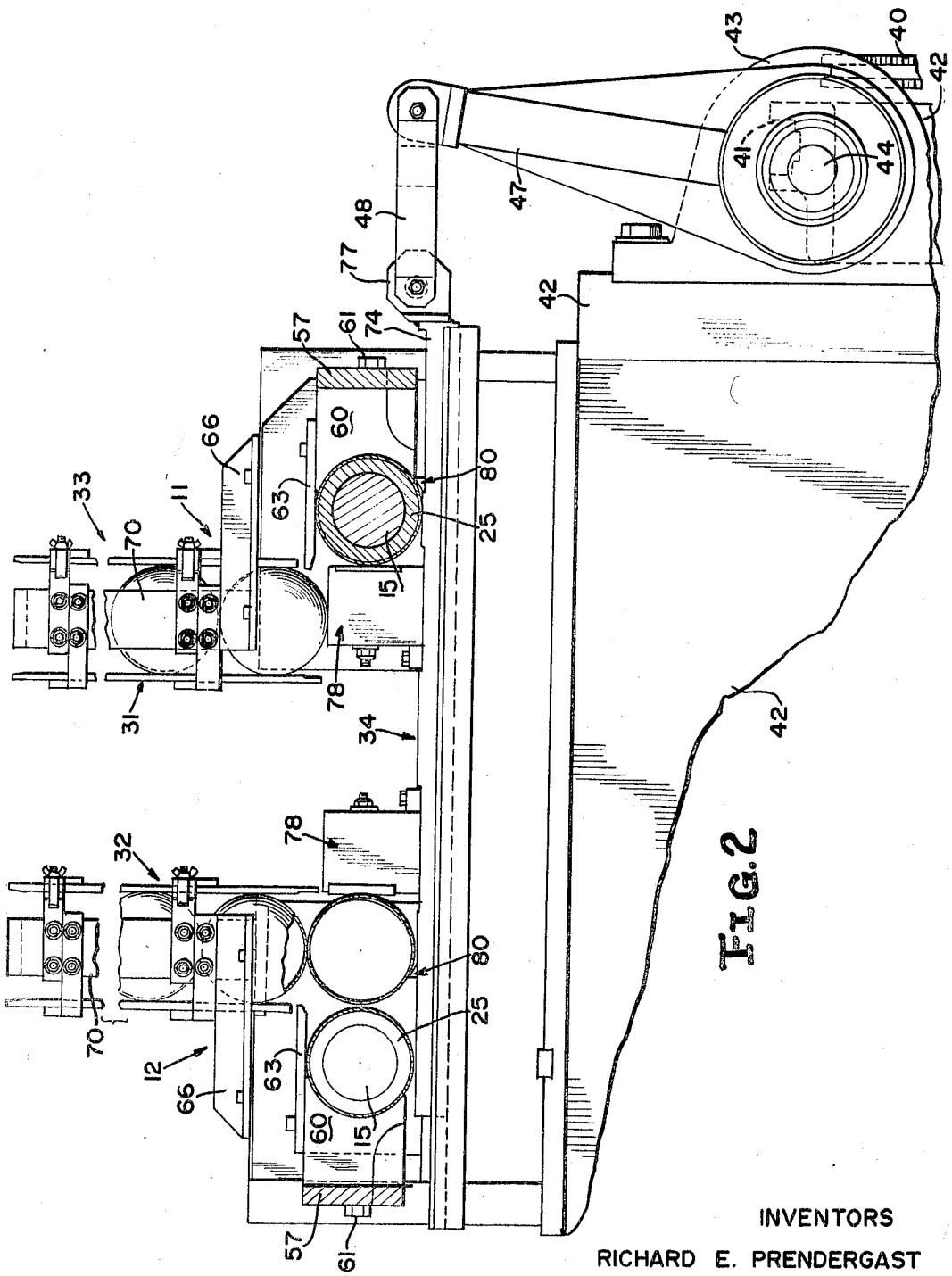


FIG. 2

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WALL IRONING MACHINE

Filed Oct. 22, 1965 4 Sheets-Sheet 3

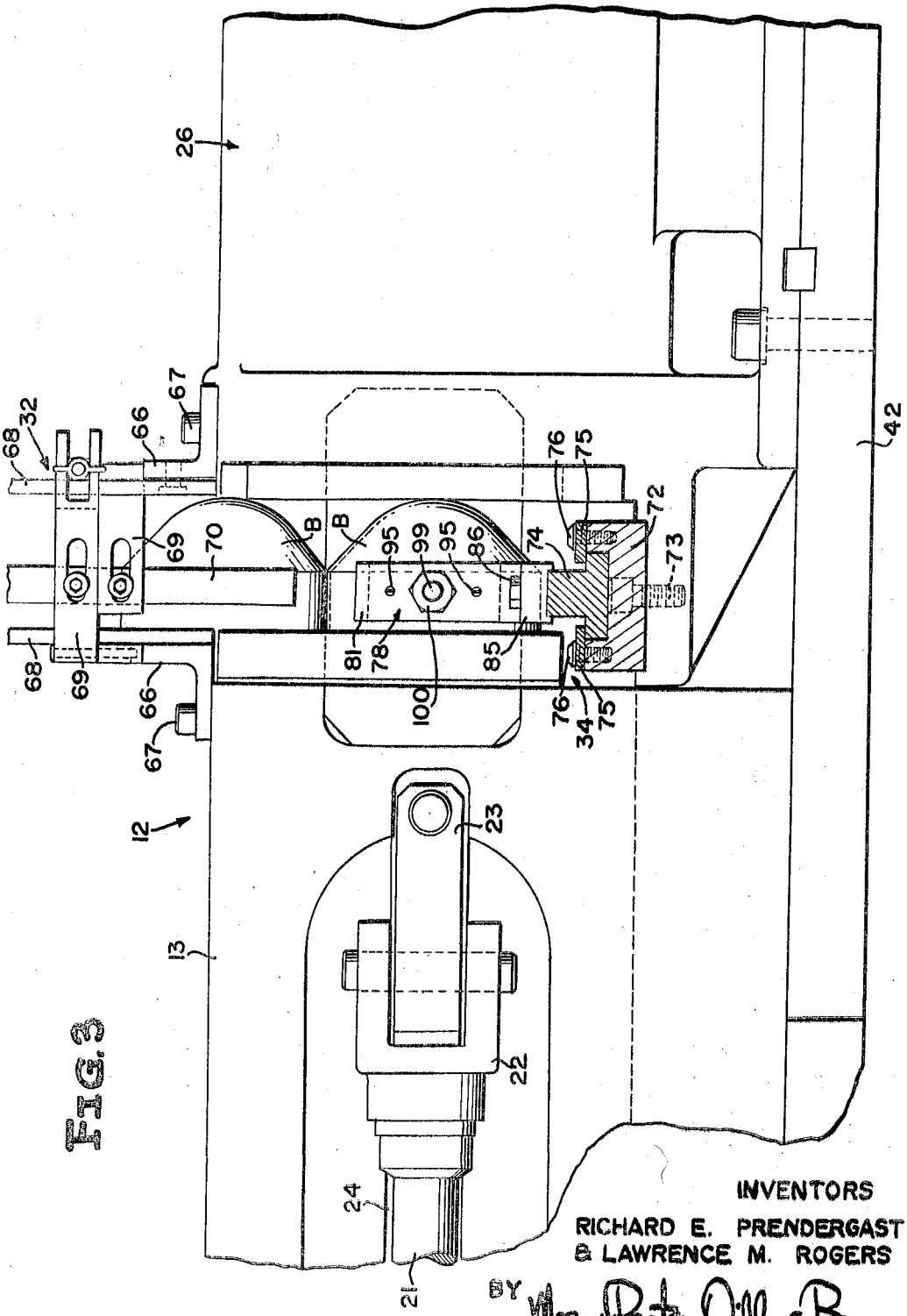


FIG. 3

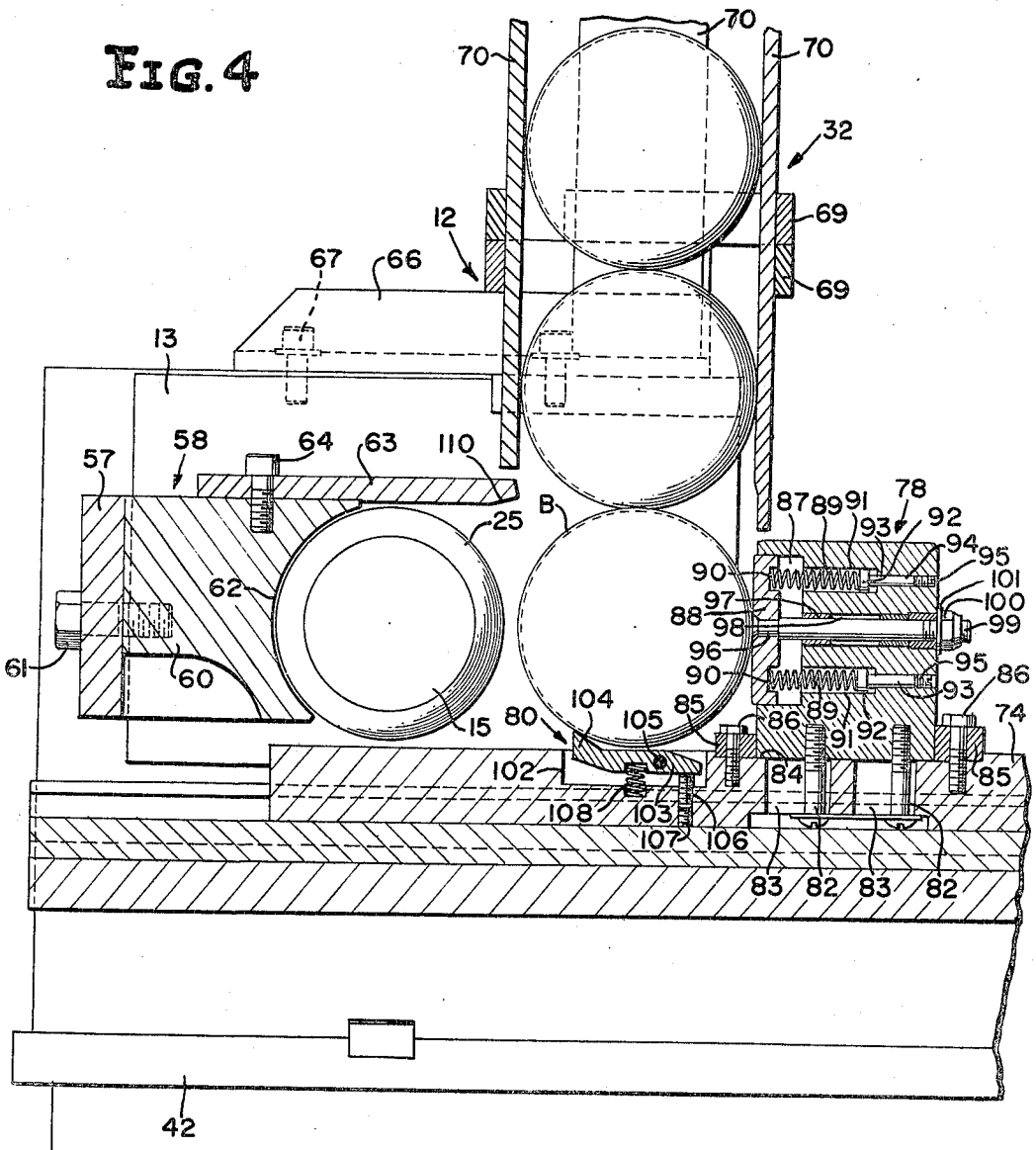
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FIG. 4



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WALL IRONING MACHINE

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U.S. Cl. 72—349 9 Claims

ABSTRACT OF THE DISCLOSURE

This disclosure relates to a feed mechanism for a wall ironing machine of the type which includes two reciprocating rams driven in out-of-phase relation by a crankshaft. The disclosure particularly relates to a feed mechanism for feeding blanks into the wall ironing apparatus in timed relation to the movement of the rams. Two hoppers are provided for supplying blanks, one hopper for each of the rams. On the other hand, a single feed mechanism is provided for alternately receiving blanks from the two hoppers and feeding the blanks to the respective rams.

This invention relates in general to new and useful improvements in wall ironing machines, and more specifically to a novel feed mechanism for a wall ironing machine.

This invention has to do with a machine into which generally cup-shaped blanks are fed and which blanks are re-shaped by a wall ironing method so as to be in the form of elongated constant cross section closed end tubular members which are suitable for the formation of cans. The invention is particularly directed to a feed mechanism for feeding the blanks into the wall ironing apparatus in timed relation to the movement of the moveing components of the wall ironing apparatus.

The primary object of this invention is to provide a feed mechanism suitable for use with a wall ironing machine of the type having two wall ironing mechanisms disposed in side-by-side relation and being driven 180 degrees out of phase, the feed mechanism being intimately operated in timed sequence to the reciprocation of the wall ironing mechanism so as to sequentially feed blanks to the two walls ironing mechanisms.

Another object of this invention is to provide a novel feed mechanism in accordance with the foregoing wherein the wall ironing machine includes a crankshaft and the feed mechanism is driven from the crankshaft by means of a cam for converting rotary motion into periodic rectilinear motion.

Another object of this invention is to provide a novel wall ironing machine which includes two wall ironing mechanisms disposed in side-by-side spaced relation and driven 180 degrees out of phase by means of a crankshaft, the wall ironing machine also including a feed mechanism for sequentially supplying blanks to the wall ironing mechanism, the feed mechanism including a pair of hoppers disposed between the wall ironing mechanism and a transversely movable feed unit, the feed unit being driven at intervals in timed relation to the reciprocation of the wall ironing mechanism by means of a cam which is drivingly connected to a crankshaft of the machine, the cam, in turn, rocking the rocker shaft which is disposed alongside the wall ironing mechanisms and the rocker shaft having a lever connected to the feed unit for effecting the reciprocation thereof.

Another object of this invention is to provide a novel feed unit for receiving blanks disposed in a vertical hopper and transferring the blanks sideways into a wall ironing mechanism, the feed unit including a slide plate having mounted thereon a pusher disposed at one side of the hopper, and a resiliently mounted seat carried by the slide plate in alignment with the hopper, the seat having a portion thereof generally facing the pusher so as to urge blanks towards the pusher, the seat serving the dual function of preventing a lowermost blank from being squeezed out of the bottom of the hopper by other blanks and holding the bottommost blank against the pusher.

Still another object of this invention is to provide a novel feed unit in accordance with the foregoing wherein there is associated with the feed unit a blank positioning unit against which a blank may be clamped by the pusher, the pusher having a resiliently mounted face plate to facilitate the resilient clamping of a blank in place.

With the above and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description, the appended claims and the several views illustrated in the accompanying drawings.

In the drawings:

FIGURE 1 is a schematic plan view with parts broken away and shown in section of the wall ironing machine of this invention.

FIGURE 2 is an enlarged fragmentary transverse vertical sectional view taken along the line 2—2 of FIGURE 1 and shows the specific details of the feed mechanism.

FIGURE 3 is an enlarged fragmentary longitudinal vertical view taken generally along the line 3—3 of FIGURE 1 and shows the slide plate and associated guide of the feed unit in section.

FIGURE 4 is an enlarged fragmentary transverse vertical sectional view taken along the line 4—4 of FIGURE 1.

Referring now to the drawings in detail, it will be seen that there is illustrated in FIGURE 1 a wall ironing machine which is generally referred to by the numeral **10**. The wall ironing machine **10** includes two wall ironing mechanisms **11** and **12** which are disposed in longitudinal side-by-side spaced relationship. Each of the wall ironing mechanisms **11** and **12** includes a ram housing **13** in which there is slidably mounted a ram **14** having projecting forwardly therefrom a reduced extension **15**. Each ram **14** has pivotally connected thereto a connecting rod **16** which, in turn, is connected to a journal of a crankshaft **17** is rotated in any desired manner.
is so constructed whereby the rams **14** and their extensions **15** are disposed 180 degrees out of phase. The crankshaft **17** is rotated in any desired manner.

At the right end of each of the ram housings **13** there is provided a slide **18** through which the ram extension **15** freely reciprocates. The slide **18**, in turn, is mounted for longitudinal reciprocatory movement by means of a pair of extensible fluid motors or cylinders **20**. The cylinders **20** are mounted on the ram housing **13** and each has a plunger **21** which is provided at its forward end with a fitting **22** that is connected to an arm **23** extending outwardly from the slide **18**. It is to be noted that the ram housing **13** is slotted as at **24** to receive the arms **23**. A redraw ring **25** is carried by the guide **18** for reciprocatory movement therewith, but may be dispensed with for some containers if so desired.

Each wall ironing mechanism **11** also includes the die assembly which is generally referred to by the numeral **26**. The die assembly **26** is disposed in longitudinally spaced relation with respect to its associated ram housing **13** and includes a housing **27**. The die assembly **26** is of a conventional type and the specific details of the dies thereof do not constitute a part of this invention and therefore, no attempt has been made to specifically illustrate a die assembly of the type which is actually utilized. It is, however, pointed out here that a conventional die

assembly, starting from the left end of the housing **27**, including a redraw die, three ironing dies and a stripper, which stripper is normally mounted at the right end of the housing **27**.

In the general operation of the wall ironing machine **10**, blanks B are fed into the space between each ram housing **13** and its associated die unit **26**. Then the ram **14** and the slide **18** are moved to the right with the redraw ring **25** cooperating with the ram extension **15** and the die assembly **26** to effect a redrawing operation. The redraw ring **25** stops in cooperative relation with respect to the die assembly **26** and the redrawn blank is moved further through the die assembly **26** by the ram extension **15**. As the redrawn blank B is moved further through the die assembly **26**, the three ironing dies serve to iron out the redraw blank. The redrawn and ironed blank passes entirely through the die assembly **26** and when the ram extension **15** is withdrawn, the stripper of the die assembly **26** serves to strip the formed tubular member, which is now referred to by the letter M, from the ram extension **15**. The formed tubular members then drop down onto an endless takeway conveyor **30**.

In order to effect the automatic feeding of the blanks B into the wall ironing mechanisms **11** and **12**, there is positioned between the wall ironing mechanisms **11** and **12** generally in alignment with the spaces between the respective rams and guide units a pair of vertically disposed feed hoppers **31** and **32**. The feed hoppers **31** and **32** are of like construction with the feed hopper **31** being intended to feed blanks B into the wall ironing mechanism **11** while the hopper **32** is intended to feed blanks into the wall ironing mechanism **12**.

The hoppers **31** and **32** are portions of a feed mechanism which is generally referred to by the numeral **33**. The feed mechanism **33** also includes a feed unit, which is generally referred to by the numeral **34**. The feed unit **34** is mounted for transverse reciprocatory movement in timed relation to the reciprocation of the ram extensions.

The reciprocation of the feed unit **34** at timed intervals is accomplished by means of a cam **35** which is carried by a transversely mounted shaft **36**. The shaft **36** is rotated in unison with the crankshaft **17** by means of a drive chain **37** which is entrained over a sprocket **38** connected to the crankshaft **17** and a sprocket **40** which is carried by the shaft **36**. The ram **35** has a cam groove **41** which is shaped to effect the conversion of rotary movement to movement transversely of the machine **10** at predetermined intervals.

The machine **10** includes a suitable frame or housing **42** from which there projects bearings **43**. A rocker shaft **44**, which is disposed alongside the wall ironing mechanism **11**, is channeled in the bearings **43** for periodical oscillatory movement. The driven end of the rocker shaft **44** is provided with a lever **45** which carries a cam follower **46** that is seated in the cam groove **41**. Thus, the rotation of the cam **35** effects the periodical rocking of the rocker shaft **44**. The output end of the rocker shaft **44** is provided with a crank **47**. The crank **47** is connected to the feed unit **34** by means of a link **48**.

It is also pointed out at this time that the shift **36** is connected to an angle gear box **49** and drives a longitudinal shaft **50** which is supported from the frame or housing **42** by means of a suitable bearing **51**. The shaft **50** has an output sprocket **52** which is connected to a driven sprocket **53** by means of a drive chain **54**. The driven sprocket **53** is carried by a drive shaft **55** for the conveyor **30**.

Each ram housing **13** includes a longitudinally extending bar **57** which is utilized to support a blank positioning unit generally referred to by the numeral **58**, as indicated in FIGURE 2. Each blank positioning unit **58** is interchangeably mounted and includes a stop member **60** which is secured to the bar **57** by means of suitable fasteners **61**. The stop member **60** is configurated to provide a seat **62** disposed alongside the path of movement of the redraw ring **25** and is shaped to receive and fix the transverse position of the blank B. The stop member **60** carries an upper guide plate **63** which is secured in place by means of suitable fasteners **64**. The guide plate **63** is utilized for the purpose of guiding a blank B into proper position with respect to the seat **62** in a manner to be described in detail hereinafter.

At this time it is pointed out that each of the hoppers **31** and **32** is supported from the associated ram housing **13** and die assembly **26**. There is secured to the upper portion of each ram housing **13** and die assembly **26** a pair of transversely extending, longitudinally spaced angle members **66** which are releasably retained in place by means of fasteners **67** in the manner best shown in FIGURE 3. Each of the angle members **66** has secured thereto an upstanding end plate **68** of the associated hopper. Each end plate **68** carries a plurality of generally L-shaped hopper memebrs **69** which are disposed in overlapped relation. The L-shaped hopper members **69** are connected together by vertical rails **70**. It will also be noted that the L-shaped hopper members **69** are of a split construction whereby each of the hoppers **31** and **32** may be adjusted so as to vary both the width and depth thereof so as to accommodate blanks of different sizes.

Referring now to FIGURES 2 and 3 in particular, it will be seen that the feed unit **34** includes a transverse guideway **72** which is suitably supported by the frame **42**, such as by means of fasteners **73**. The guideway **72** has slidably mounted therein for transverse movement a slide plate or bar **74**. The slide plate or bar **74** is retained in the guideway **72** by means of retainer plates **75** which are releasably secured in place by means of fasteners **76**. It is to be noted that the right end of the slide bar **74**, as viewed in FIGURE 2, is provided with a fitting **77** to which the link **48** is pivotally connected.

Referring once again to FIGURE 2, it will be seen that the central portion of the slide bar **74** has secured thereto a pair of pushers **78** which are so related whereby when one of the pushers is in a position clamping a blank B against a stop member **60**, the other of the pushers is in a retracted position for receiving a blank from the respective hopper. Also, it is to be noted that the slide bar **74** supports a seat for a blank adjacent each of the pushers **78**, the seats being generally referred to by the numeral **80**. Inasmuch as the pushers and seats are identical, except for the left and right relationship, only the left-hand portion of the feed unit **34** will be described in detail here.

Referring now to FIGURE 4 in particular, it will be seen that the pusher **78** includes a block **81** which is secured to the slide bar **74** by means of a pair of fasteners **82** which are disposed in slots **83** extending longitudinally of the slide bar **74** so that the pusher **78** may be adjusted longitudinally of the slide bar **74** and transversely of the machine **10**. The block **81** is seated in a shallow recess **84** formed in the upper surface of the slide bar **74** and the position thereof is controlled by positioning blocks **85** which are secured in place by fasteners **86**. The positioning blocks **85** may be interchangeable in accordance with the size of blank to be fed if it is desired to shift the pusher **78** although different pushers normally will be provided for different sizes of blanks B.

That face of the block **81** which opposes the stop member **60** is provided with a recess **87** in which there is slidably seated a face plate **88**. The face plate **88** is resiliently urged towards the associated stop member **60** by means of a pair of springs **89** which have the opposite ends thereof seated in shallow bores **90** in the face plate **88** and elongated bores **91** in the block **81**. Each of the bores **91** is further provided with an adjustable stop member **92** having an elongated shank **93** which extends into a small diameter bore **94** in the block **81**. Movement of the shanks **93** to the right, as viewed in FIGURE 4, is

limited by adjustable set screws **95** threaded into the right-hand ends of the bore **94**.

The movement of the face plate **88** towards the stop member **60** is limited by a rod **96** which is secured at one end to the plate **88**. The rod **96** is slidably mounted in a pair of bushings **97** disposed within a bore **98** extending entirely through the block **81**. The right-hand end of the rod **96** is externally threaded, as at **99**, and has threadedly engaged thereon a stop nut **100** which is of the self-locking type. If desired, a washer **101** may be positioned between the nut **100** and the block **81**.

It will be readily apparent from FIGURE 4 that when the guide bar **74** is moved to the left, the pusher **78** will move the lowermost blank B out of the hopper **32** towards the stop member **60**. When the blank B engages the seat **62**, further movement of the pusher **78** will result in the compressing of the springs **89** so as to prevent damage to the blank B while tightly retaining the blank against the seat **62**.

Referring once again to FIGURE 4, it will be seen that the seat **80** associated with each pusher **78** is partially positioned within a recess **102** formed in the slide bar **74**. Each seat **80** includes an elongated horizontal portion **103** and a shorter upstanding portion **104** which is integrally connected to the horizontal portion **103** and slopes at an angle thereto. A pivot pin **105** extends through the horizontal portion **103** to pivotally mount the seat **80**. The movement of the seat **80** in a clockwise direction is limited by means of an adjustable stop **106** which is threaded into an internally threaded bore **107** in the slide bar **74**. The seat **80** is resiliently urged in a clockwise direction by means of a spring **108** having the opposite ends thereof seated in shallow recesses formed in the slide bar **74** and the seat **80**. It will be noted that the upstanding portion **104** generally faces the pusher **78** and urges a blank B into engagement with the face plate **88** thereof.

The seat **80** has two primary purposes. It is to be noted that the blanks B will be positioned in stacked relation within the hoppers **31** and **32**. The normal force reaction would be to squirt the lowermost blank into the path of the ram extension **15** if the blank is slightly displaced towards the ram extension. However, due to the particular shape of the seat **80** and the spring force thereon, the lowermost blank is retained in the position shown in FIGURE 4. At the same time, as is pointed out above, the seat **80** serves to hold the lowermost blank against the pusher **78** so that when the feed unit **34** is shifted to the left, as viewed in FIGURE 4, the lowermost blank will be retained in the position illustrated relative to the pusher **78**. Thus, there is the desired control over the blank B during the feeding thereof.

It will be seen that when the blank B is moved to the left, it will come into engagement with a cam surface **110** of the guide plate **63** and will be urged downwardly from its slightly elevated position shown in FIGURE 4. When the blank is cammed downwardly, the seat **80** will be pivoted in a counterclockwise direction against the spring **108** so as to facilitate the movement of the blank into proper seating engagement with the stop member **60**. It is to be noted that when the pusher **78** is moved to its position retaining a blank in alignment with the ram extension **15**, the seat **80** has moved beyond the path of the ram extension **15** and is thus out of the path of movement thereof. It is pointed out at this time that the stop **106** must be set in a position where when no blank is fed and the sheet **80** is in its highest position, it will still clear the ram extension **15**.

It is to be understood that when the plunger **78** associated with the hopper **31** is moving to the left so as to position a blank B against the associated stop member **60**, the other pusher **78** will also be moved to the left to a position where it will clear the associated hopper **33** and permit the stack of blanks to be lowered so that the then lowermost blank will become properly seated on the seat **80** for feeding into the wall ironing mechanism.

Referring once again to FIGURE 1, it will be seen that the feed unit **34** is illustrated in a position wherein a blank has been fed to the wall ironing mechanism **12**. The crankshaft **17** is in a position advanced on the order of 10 degrees beyond the fully retracted position of the ram **14** of the wall ironing mechanism **12** so that the ram extension **15** thereof is moving to the right in FIGURE 1. At the same time, the ram extension **15** of the wall ironing mechanism **11** is moving to the left. The cam **35** is so configurated whereby the transverse movement of the slide bar **74** is one direction occurs during approximately 40 to 60 degrees of rotation of the crankshaft **17**. By properly timing the operation of the feed unit **34**, it will be seen that the retracton of the ram extensions **15** within the ram housings **13** may be held to a minimum, thereby reducing the required over-all stroke of the rams **14**. It will be readily apparent that the shorter the stroke of the rams **14**, the greater the number of strokes per minute with the same ram travel speed and the lower acceleration at a given speed. It will also be evident that the specific correlation of the operation of the feed unit **34** with the reciprocation of the rams **14** is highly important.

Although only a preferred embodiment of the invention has been specifically illustrated and described herein, it is to be understood that minor variations may be made in the disclosed machine without departing from the spirit and scope of the invention, as defined by the appended claims.

We claim:

1. A wall ironing machine for converting cup-shaped blanks into elongated constant cross section closed end tubular members, a pair of wall ironing assemblies disposed in spaced side-by-side relation and each including a reciprocating ram, a crankshaft reciprocating said rams out of phase, a pair of blank hoppers disposed between said wall ironing assemblies, a single feed unit mounted for movement transversely of the path of said rams for alternatingly feeding blanks from said hoppers to said wall ironing assemblies, and drive means reciprocating said feed unit in timed relation to the reciprocation of said rams.

2. The machine of claim **1** wherein said drive means includes a rotating cam connected to said crankshaft for rotation in unison therewith for converting rotary motion into transverse rectilinear motion.

3. The machine of claim **1** wherein said drive means includes a rotating cam connected to said crankshaft for rotation in unison therewith for converting rotary motion into transverse rectilinear motion, a rocker shaft extending alongside said wall ironing assemblies, a first crank arm on said rocker shaft having a cam follower engaged with said cam, and a second crank arm carried by said rocker shaft and connected to said feed unit.

4. A wall ironing machine for converting cup-shaped blanks into elongated constant cross section closed end tubular members, a pair of wall ironing assemblies disposed in spaced side-by-side relation and each including a reciprocating ram, a crankshaft reciprocating said rams out of phase, a pair of blank hoppers disposed between said wall ironing assemblies, a single feed unit mounted for movement transversely of the path of said rams for alternatingly feeding blanks from said hoppers to said wall ironing assemblies, and drive means reciprocating said feed unit at intervals in timed relation to the reciprocation of said rams.

5. The machine of claim **1** wherein said feed unit includes a pair of pushers disposed in back-to-back relation.

6. The machine of claim **1** wherein each wall ironing assembly includes a blank positioning unit for aligning blanks with the associated ram, and said feed unit includes a pusher opposing each blank positioning unit for removing a blank from an associated one of said hoppers and moving the blank into clamped engagement with the associated blank positioning unit.

7. The machine of claim 1 wherein each wall ironing assembly includes a blank positioning unit for aligning blanks with the associated ram, and said feed unit includes a pusher opposing each blank positioning unit for removing a blank from an associated one of said hoppers and moving the blank into clamped engagement with the associated blank positioning unit, each pusher having a blank engageable face plate resiliently urged towards the associated blank positioning unit whereby a blank is resiliently clamped against the associated blank positioning unit.

8. The machine of claim 1 wherein each wall ironing assembly includes a blank positioning unit for aligning blanks with the associated ram, and said feed unit includes a pusher opposing each blank positioning unit for removing a blank from an associated one of said hoppers and moving the blank into clamped engagement with the associated blank positioning unit, and a resiliently mounted seat adjacent each pusher for holding a blank engaged with the associated pusher during the movement of the blank towards the associated blank positioning unit.

9. The machine of claim 1 wherein each wall ironing assembly includes a blank positioning unit for aligning blanks with the associated ram, and said feed unit includes a pusher opposing each blank positioning unit for removing a blank from an associated one of said hoppers and moving the blank into clamped engagement with the

associated blank positioning unit, and a resiliently mounted seat adjacent each pusher for holding a blank engaged with the associated pusher during the movement of the blank towards the associated blank positioning unit, each pusher having a blank engageable face plate resiliently urged towards the associated blank positioning unit whereby a blank is resiliently clamped against the associated blank positioning unit.

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