

March 8, 1966

F. U. S. GILBERT

3,238,908

CAN SEAMING MEANS

Filed Jan. 15, 1963

8 Sheets-Sheet 1

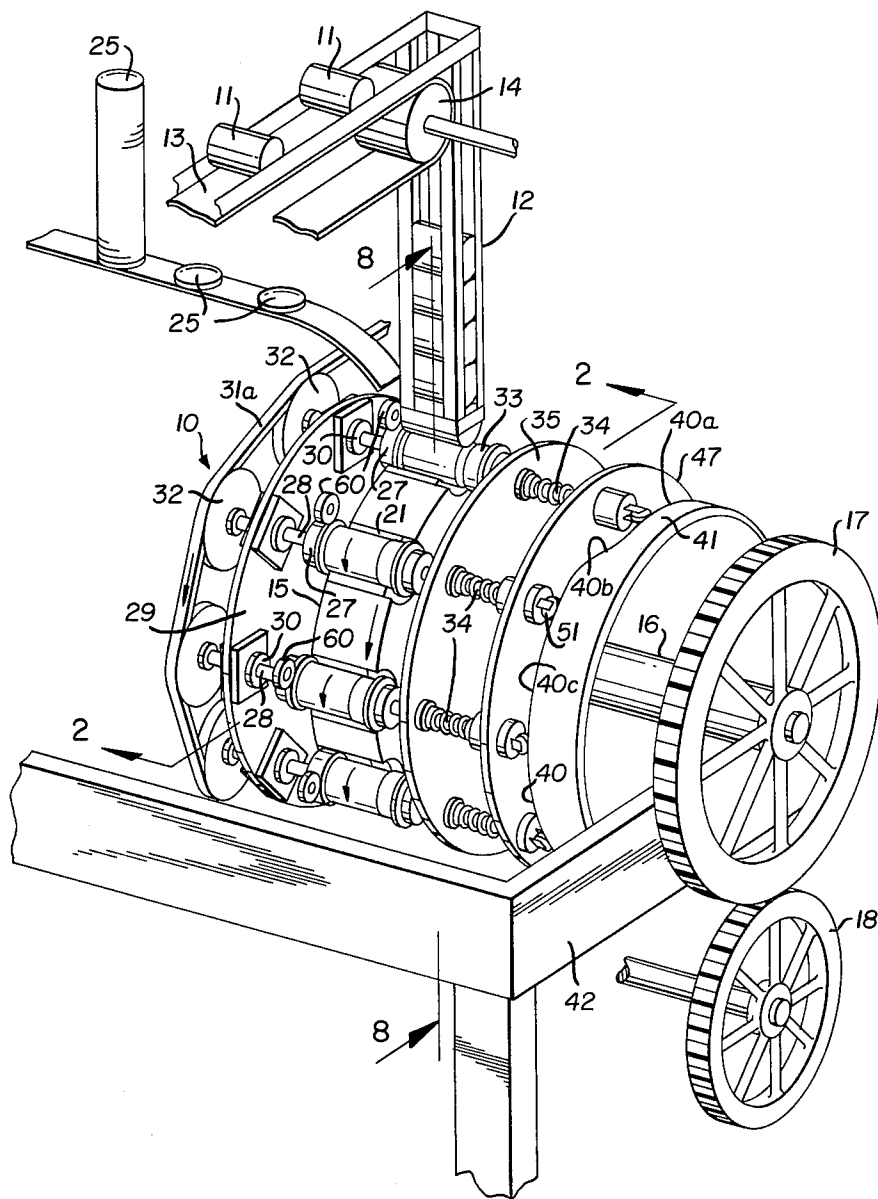


FIG. 1

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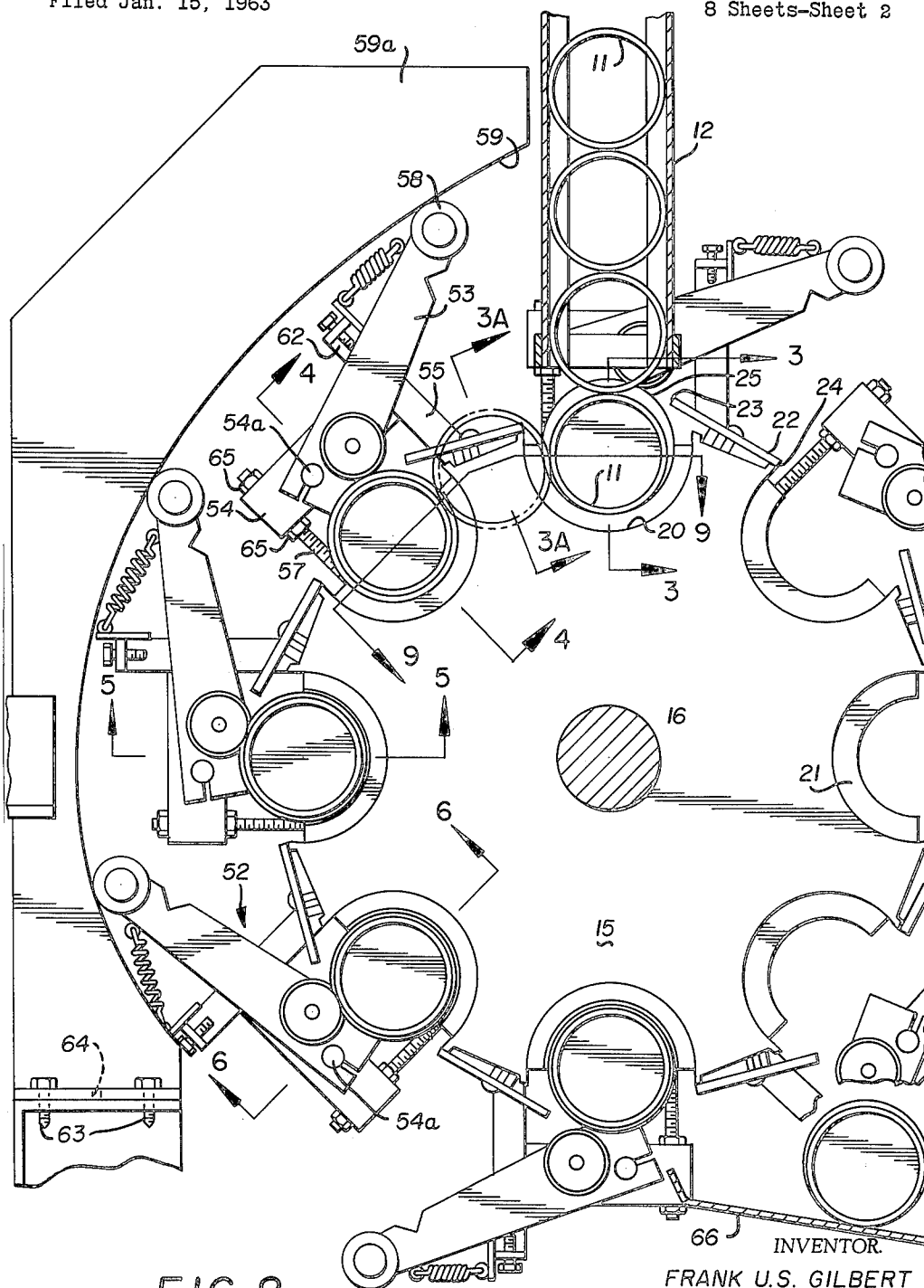


FIG. 2

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FIG. 3

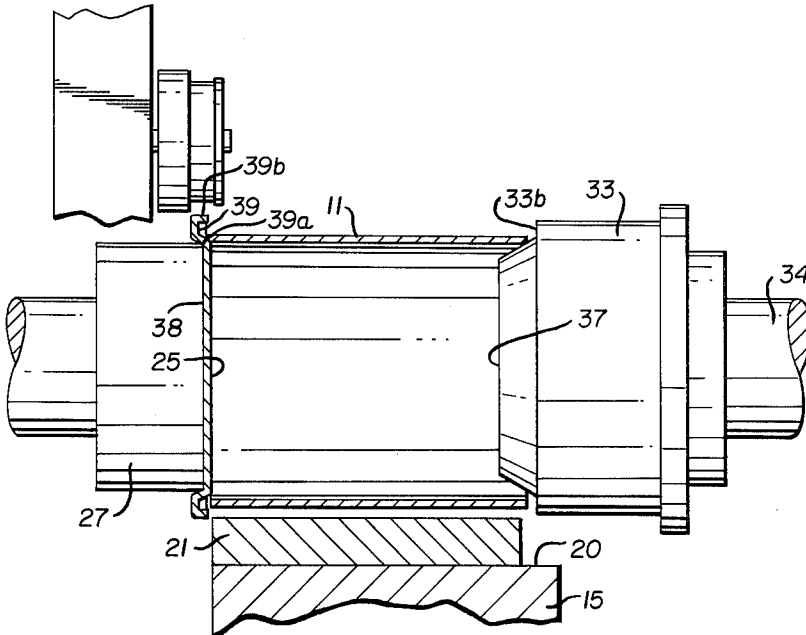
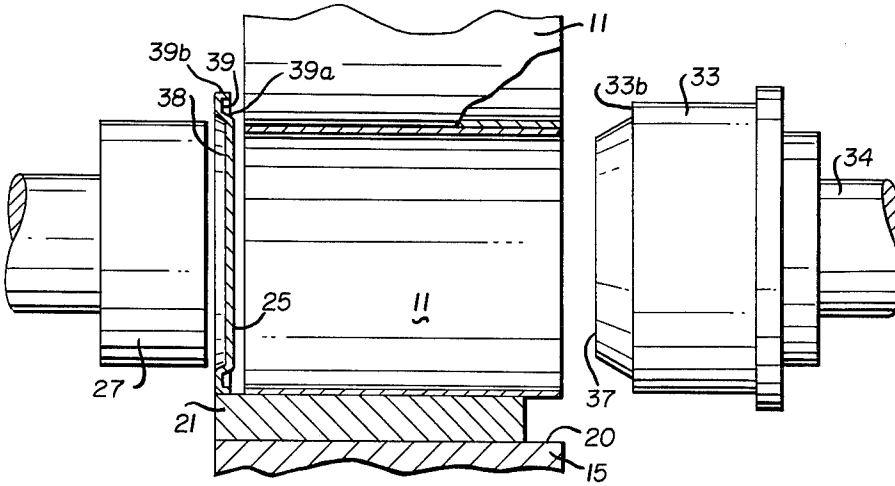


FIG. 3A

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FIG. 4

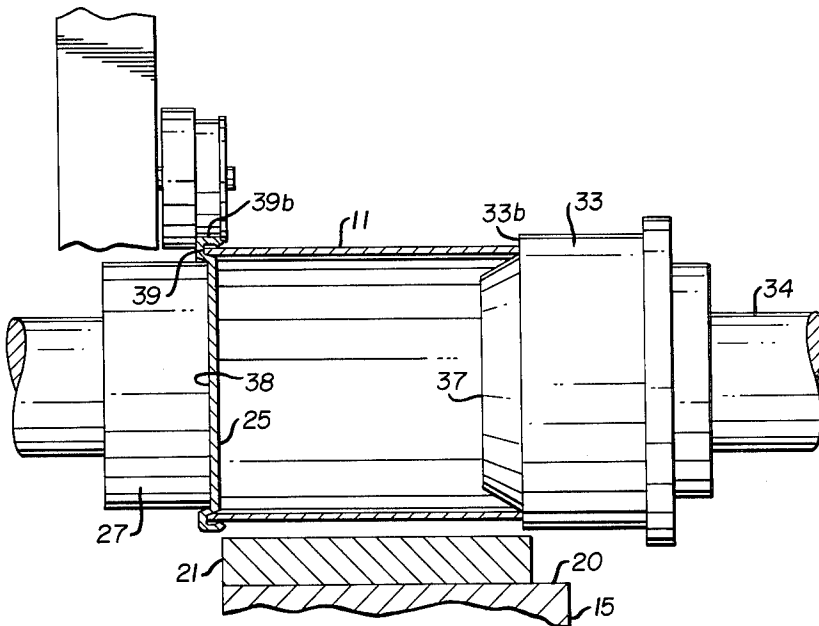
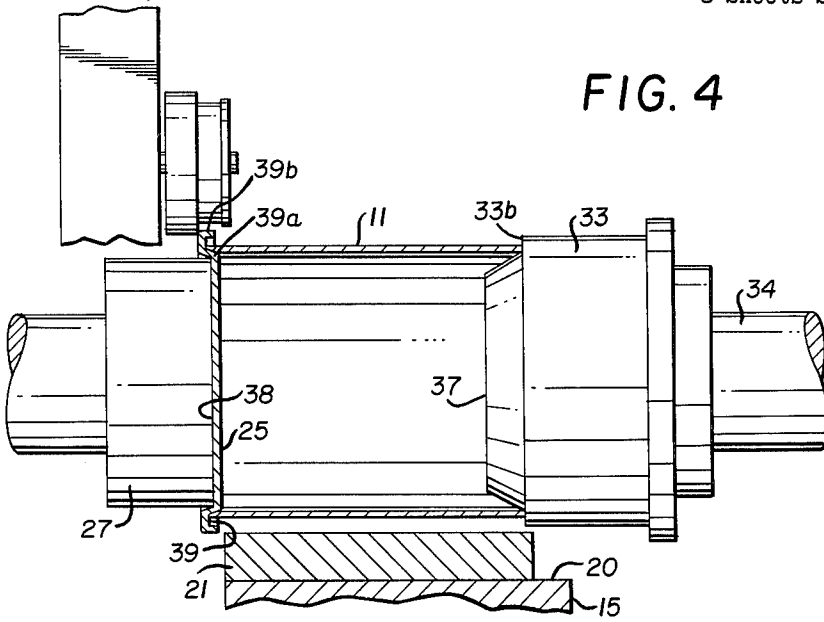


FIG. 5

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FIG. 6

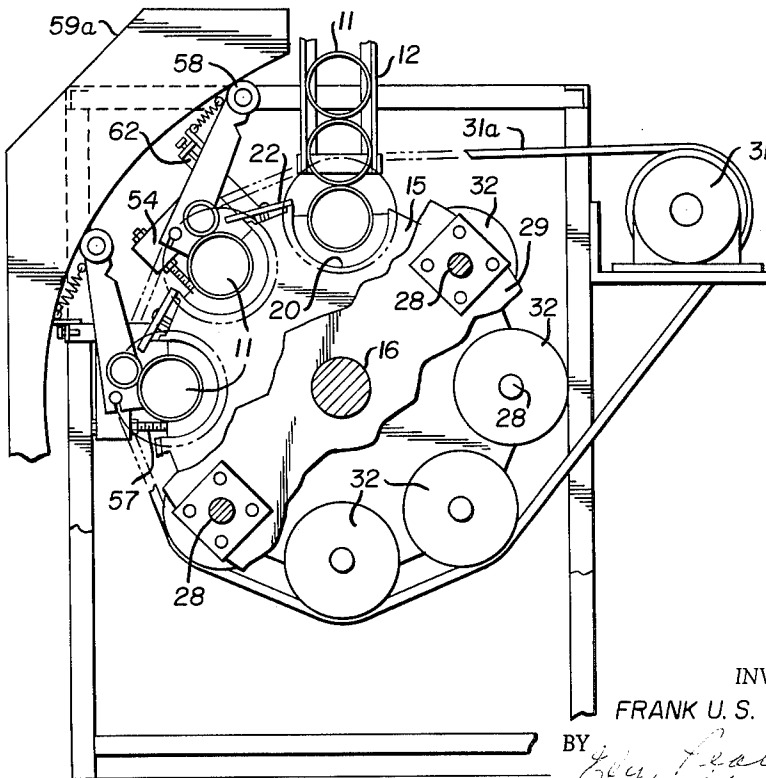
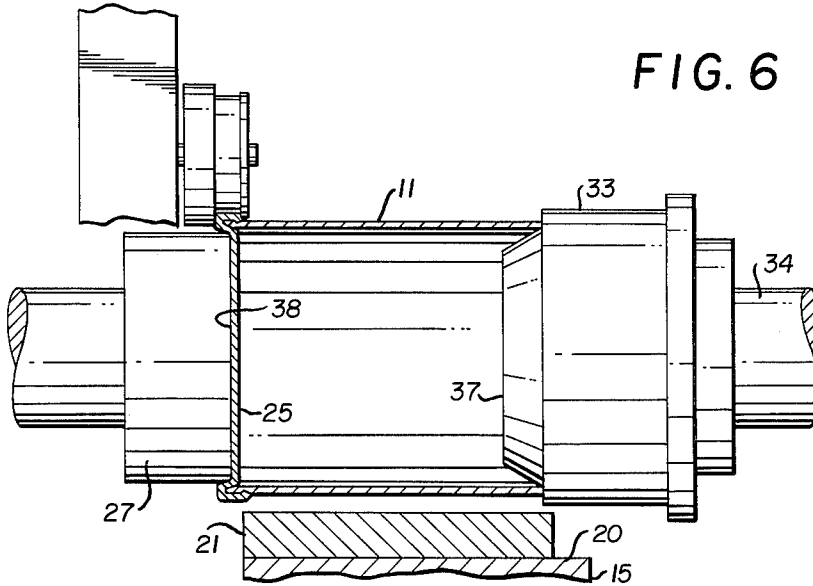


FIG. 7

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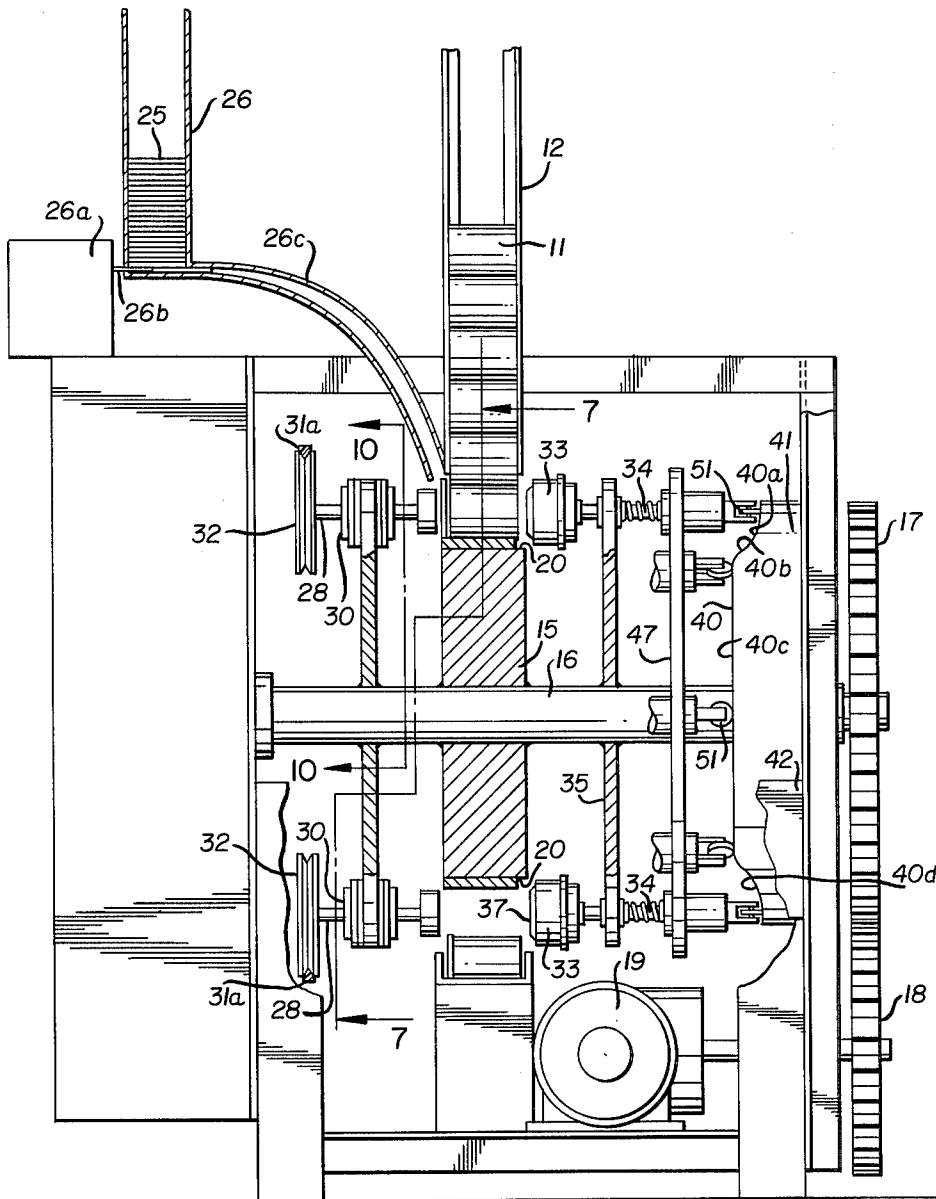


FIG. 8

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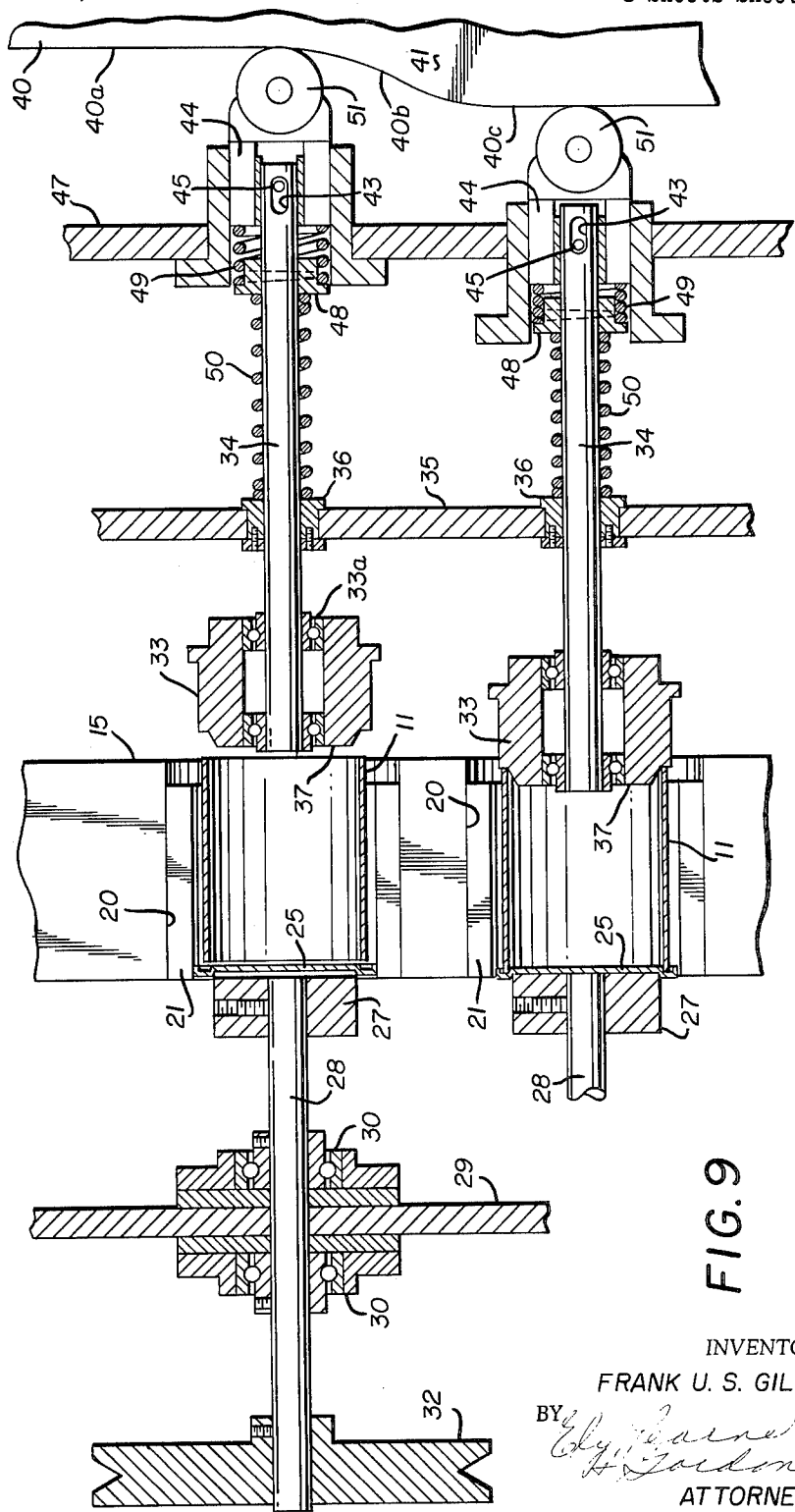
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3,238,908

CAN SEAMING MEANS

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Filed Jan. 15, 1963, Ser. No. 251,555

16 Claims. (Cl. 113—26)

This invention relates to seaming machinery and more particularly to a device for uniting a can end to a can body.

Numerous types of can seaming machinery exist today for uniting can ends or closure members to can bodies by double or single seaming techniques. These machines may be classified as either vertical or horizontal seaming machines. The vertical machines receive can bodies in an upright or vertical position, apply can ends to the upper, open mouth of the can body, and convey the can body and can end about a predetermined path while a single or double crimp is applied to the junction between the can end and can body by a suitable seaming tool. All of these operations are performed with the can in an upright position.

The vertical machines are commonly employed after one can end has been united with the can body and after the can has been filled with its contents.

The horizontal seaming machines receive can bodies in a horizontal position and perform the same seaming functions as the vertical seaming machines. The horizontal machines are commonly employed to apply the first can end (the bottom can end with respect to a can body positioned in the vertical seaming machine) to the tubular can body.

Typically, during the travel of can bodies and can ends through the vertical machine, the can bodies and ends are each supported at the bottom by their own revolving support table. This table may be stationary if the seaming tools are caused to travel about the periphery of the junction to be seamed. The can end is easily placed and axially centered over the open mouth of the can body. The can body and can end assemblies are each supported at their tops by radially opposed seaming tools.

Can bodies which are united to can ends by a horizontal seaming machine are each supported in a horizontal position by saddles or semi-circular notches in a turret. The can ends are similarly supported by these saddles or the notches. Since the can end blanks have an annular flange which extends radially beyond the periphery of the can body, can end receiving grooves in the saddles or notches, or other provisions, were heretofore provided to permit the can end to nest with the can body upon the application of axial pressure. This axial pressure was supplied by opposed, rotating mandrels which were moved towards each other to respectively contact the open end of the can body and the axially aligned can end. These mandrels caused the can end to nest with the can body and would axially rotate the nested assembly past suitable seaming tools for the crimping operation.

Since the axial rotation is conducted at relatively high speed, means has been provided for lifting each can body and its nested can end out of contact with their supporting saddle or turret notch in order to prevent the surface of the can body from dragging on the support during rotation. This lifting means has sometimes comprised gripping jaws which pick is nested can body and can end assembly out of their supports, axially align the assembly with the opposed mandrels, and quickly release the assembly when the mandrels start to rotate the assembly. In other instances, the supports themselves have been movable to axially position the assembly with respect

to the mandrels and to withdraw to free the side wall of the can body.

These aligning mechanisms have been important because misalignment often results in defective seams, excessive rejects, and frequent interruptions due to jamming of the machines. Precise adjustment of these aligning mechanisms is frequently required.

Special aligning mechanisms reduce the productive capacity of seaming machines in proportion to the share of the operating cycle time that is devoted to manipulative operations which are not strictly combining operations but merely prepare for certain phases of the combining operations.

It is an object of the present invention to provide a horizontal can seaming machine which overcomes many of the deficiencies of the prior art devices.

More particularly, it is an object of the present invention to provide a horizontal can seaming machine in which the can bodies and can ends are nested together, freed from their supporting means, axially rotated, and seamed without the necessity of providing a lifting and aligning mechanism for the can ends and bodies.

The foregoing and numerous additional objects, features, and advantages of the invention will become apparent and more fully understood from the following detailed description of the invention, and from the accompanying drawings in which:

FIGURE 1 is a schematic perspective view of a can seaming device according to this invention;

FIGURE 2 is an enlarged fragmentary sectional view of the device of FIGURE 1, the plane of the section being indicated by the line 2—2 in FIGURE 1;

FIGURE 3 is an enlarged, fragmentary sectional view, the plane of the section being indicated by the line 3—3 in FIGURE 2;

FIGURE 3A is an enlarged, fragmentary sectional view of a can body and lid in an initial assembly stage, the relative position of the can body and lid at this stage being shown in FIGURE 2, and the plane of the section being indicated by the line 3A—3A in FIGURE 2;

FIGURE 4 is an enlarged, fragmentary sectional view, the plane of the section being indicated by the line 4—4 in FIGURE 2;

FIGURE 5 is an enlarged, fragmentary sectional view, the plane of the section being indicated by the line 5—5 in FIGURE 2;

FIG. 6 is an enlarged, fragmentary, sectional view, the plane of the section being indicated by the line 6—6 in FIG. 2;

FIGURE 7 is a fragmentary sectional view, the plane of the section being indicated by the line 7—7 in FIGURE 8;

FIGURE 8 is an enlarged, fragmentary sectional view, the plane of the section being indicated by the line 8—8 in FIGURE 1;

FIGURE 9 is a fragmentary sectional view, the plane of the section being indicated by the line 9—9 in FIGURE 2;

FIGURE 10 is a fragmentary sectional view, the plane of the section being indicated by the line 10—10 in FIGURE 8; and

FIGURE 11 is a fragmentary sectional view, the plane of the section being indicated by the line 11—11 in FIGURE 10.

Referring now to the drawings and particularly to FIGURE 1, a horizontal can seaming machine 10 is illustrated. Cylindrical can bodies 11 are fed into a vertical chute 12 by an endless overhead conveyor belt 13. The belt 13 is continuously driven by a conveyor head pulley 14 which, in turn, is driven by a suitable motor (not shown).

The can bodies 11 may be loaded onto the belt 13 by hand or the belt 13 may serve to convey can bodies 11 directly from a can body forming machine (not shown) to the chute 12.

As is shown in the drawings, the can bodies 11 are permitted to back up in the chute 12 to form a stack.

A continuously rotating turret 15 is located beneath the stack 12 and is driven at a constant angular velocity, in the direction indicated by the arrow in FIGURE 1, by a main drive shaft 16. The drive shaft 16 is, in turn, driven through spur gears 17 and 18 by a motor 19.

The turret 15 is provided with a multiplicity of equally spaced notches or pockets 20 about its periphery. In order to accommodate can bodies and ends having varying diameters, the pockets 20 may be provided with removable can receiving inserts or supports 21 so that the can receiving and supporting surface may be varied to accommodate changes in the size of the can bodies that are to be seamed in a particular production run.

As each pocket 20 and its associated insert 21 present themselves beneath the chute 12, a can body will drop into the support 21. The chute 12 extends toward the turret 15 for a distance which is sufficient to laterally support the penultimate can body 11. The penultimate can body 11 is supported at its lower side by the can body which has dropped into the support 21. When the can body which has been nested in its support 21 is removed, however, by the constantly rotating turret 15, the penultimate can body is no longer supported by the nested can.

To insure that the penultimate can body will drop in its support 21, a guide means is provided on the lands between the adjacent notches 20. As may be seen more clearly in FIGURE 2, these guide means comprise plates 22 which are inclined upwardly in the direction of rotation of the turret 15 and which have a leading edge 23 that will engage the lowermost can body in the chute 12 and a trailing edge 24 that will guide the can body into an empty support 21.

Can closure members or ends 25 are stacked in a vertical chute 26 (FIGURE 8) and are delivered to each support 21 on a one-to-one basis with the can bodies 11 by a reciprocating delivery mechanism 26a. The delivery mechanism has a finger 26b that pushes a can end 25 from the bottom of the stack and simultaneously supports the remainder of the stack. Each can end 25 travels by gravity down a delivery chute 26c to a support 21. The reciprocation of the finger 26b is timed with the rotation of the turret 15 by a suitable linkage means (not shown) to deliver an end cap to each support 21 as each support presents itself to the bottom of the chute 26c.

As may be seen more clearly in FIGURE 3, each can end 25 is dropped on its support 21 adjacent one end of the support 21. The can end 25 is initially retained in the position shown in FIGURE 3 by a pocket formed by its can body 11, which has dropped from the chute 12 to a position in which the can body is spaced from the end of its support 21, by the support 21 which has a transverse cross-section corresponding to a portion of the periphery of each can end 25, and by a backing head 27.

A backing head 27 is provided for each notch or saddle 20 and each backing head 27 is fixed to its own shaft 28. Each shaft 28 extends through a mounting plate 29 and is mounted for axial rotation with respect to the plate 29 by flanged cartridge bearings 30.

The plate 29 is fixed to the main drive shaft 16 (FIGURE 8) for synchronous axial rotation with the turret 15. Each shaft 28 and its backing head 27 are mounted on the plate 29 so that their common longitudinal axis lies in an imaginary plane defined by the axis of the main shaft 16 and the axis of a can body 11 properly positioned in its support 21. This common longitudinal axis, moreover, is spaced radially outwardly from the axis of the can body 11, positioned as shown in FIGURE 3, and is coincident with the axis of the can end 25 shown in that figure.

During a portion of their travel about the main shaft 16, the shafts 28 and their backing heads 27 are axially rotated in a counterclockwise direction as viewed in FIGURE 1. The shafts 28 are driven by a motor 31 and a V-belt 31a which engages sheaves 32 fixed to the end of each shaft 28.

A pushing head 33 is provided for each notch or saddle 20 and each pushing head 33 is rotatably mounted on its own shaft 34 by bearings 33a. Each shaft 34 extends through a support or guide plate 35 and the shafts 34 are mounted for reciprocation relative to the plate 35. As may be seen in FIGURE 9, bushings 36 are provided in the plate 35 which slidably mount each shaft 34.

The plate 35 is fixed to the main drive shaft 16 (FIGURE 8) for synchronous axial rotation with the turret 15 and the mounting plate 29. Each shaft 34 and its pushing head 33 are supported by the plate 35 so that their common longitudinal axis is coincident with the common axis of an opposite backing head 27 and its shaft 28.

Each pushing head 33 is in a retracted position relative to its notch or saddle 20 when the saddle 20 receives a can body 11 (FIGURE 3). As the turret 15, the plate 29, and the plate 35 rotate in the direction of the arrow in FIGURE 1, each backing head 33 is caused to advance toward its can body 11 after it has passed its top dead center position. When the turret 15, the plate 29, and the plate 35, have reached the position shown in FIGURE 3A, the backing head 33, associated with the saddle 20 and support 21 shown in that figure, has advanced a distance sufficient to engage the can body 11. Since the advancing face of each backing head 33 is provided with a projecting conical frustum 37, the backing head exerts a force on the can body which may be resolved into two components. One component is directed along the side wall of the can body 11 to force the can body 11 to the left, as viewed in FIGURE 3, so that the can body pushes against its can end as shown in FIGURE 3A. The other component is directed radially outwardly from the zone of contact between the backing head 33 and one end of the can body 11 to lift that end upwardly and out of contact with the support 21.

As the can body 11 is pushed against its can end 25, the can end is forced to the left as viewed in FIGURE 3 until a recessed portion 38 of the can end 25 nests with the flat face of its backing head 27 as shown in FIGURE 3A. Since the backing head 27 has begun its axial rotation in FIGURE 3 and is rotating when its can end nests, this rotation is transmitted to the nested can end. As the can body 11 continues to be pushed to the left, as viewed in FIGURE 3A, the rapidly rotating can end 25 imparts a centrifugal force to the end portion of the can body that is being pressed against it and the end portion is "spun" into an annular land 39 of the can end 25. It should be noted that the annular land 39 includes a sloping wall 39a which induces the proper nesting of the can end and can body in the previously described manner.

When the pushing head 33 reaches the limit of its stroke, as is shown in FIGURE 4, the can body 11 is securely and concentrically nested at one end in the annular land 39 of the can end 25 and is held at its other end by the axial pressure exerted by the head 33. In this position the can body 11 and the can end 25 are elevated from their support 21 and the can end and body assembly and the pushing head 33 are rotated in the direction of the arrows in FIGURE 1.

It should be noted that, since the turret 15 is rotated at a speed which is sufficient to pick approximately 75 to 100 can bodies per minute from the chute 12, the exact position of a can body and can end relative to each other and to their support 21, backing head 27, and pushing head 33 is difficult to determine at any given instant. The foregoing description, therefore, is directed to a typical situation.

Referring now to FIGURE 9, it will be seen that the aforementioned reciprocation to each shaft 34 is caused

by a cam track 40 defined by a stationary barrel cam 41. The barrel cam 41 is fixed to a main support frame 42 (FIGURES 1 and 8) by suitable connecting means (not shown). One end of each shaft 34 has a slot 43 extending therethrough. The slotted end of each shaft 34 is slidably mounted in a cylinder 44 and a pin 45 extends through each cylinder 44 and slot 43 to prevent the shaft 34 from rotating within the cylinder 44. Each cylinder 44 is fixed to its own bushing 46 and each bushing 46 is mounted for reciprocation in a cam roller support plate 47. The plate 47 is fixed to the main drive shaft 16 (FIGURE 8) for synchronous axial rotation with the turret 15, the mounting plate 29, and the guide plate 35.

A collar 48 is keyed to each shaft 34 and each collar 48 and its associated shaft 34 are urged toward the turret 16 by a relatively strong spring 49. A relatively weak spring 50 surrounds each shaft 34 and extends between the collar 48 and the bushing 36.

A roller cam 51 is provided on each cylinder 44 and each roller cam is urged against a recessed portion 40a of the cam track 40 by the relatively strong spring 49. As the cam rollers 51 follow the recessed portion 40a of the cam track 40, the shaft 34 and its head 33 will be in a fully retracted position as is shown in FIGURES 3 and 9. When a cam roller 51 begins to climb a beveled portion 40b of the cam track 40, the pushing head 33 associated with the cam roller will approach, contact, and lift its can body 11 in the previously described manner.

Until the stroke of the pushing head 33 is stopped by the opposed end portion of the can body, i.e., until a flat annular face 33b at the base of the projecting conical frustum 37 of the pushing head 33 is flush against its can end, only the relatively weak spring 50 will be compressed and the shaft 34 will be held in its extended position relative to its cylinder 44 by its relatively strong spring 49. The stroke of the pushing head 33, however, is stopped in this manner prior to the time that a cam roller 51 ends its climb up the beveled portion 40b. Further travel of the cam roller 51 along the portion 40b compresses the relatively strong spring 49 and retracts the shaft 34 within its cylinder 44.

After a cam roller 51 has climbed the beveled portion 40b and is rolling on a raised portion 40c of the cam track 40 (FIGURE 9), the pushing head 33 associated with the cam roller 51 exerts a force on its can body 11 which is equal to the difference in pressure exerted by the springs 49 and 50. The pressure excess exerted by the spring 49 serves to retain its can body and can end assembly in a firmly clamped relationship. It should be noted that the firm resilient pressure exerted by the pressure head 33 on its can body and can end assembly will compensate for any wear that may occur between the cam rollers 51 and the cam track 40 and/or slight variations in the length of the can bodies 11.

After the can body and can end assemblies are clamped and while they are being axially rotated and conveyed about the main shaft 16, a peripheral flange 39b of each can end 25 is progressively crimped over the portion of the can body which is nested in the annular land 39 to securely unite the can end 25 and can body 11 as is shown in FIGURE 6. The crimping operation is performed on each can body and can end assembly by a multiplicity of seaming tools 52. A seaming tool 52 is provided for each saddle or notch 20 adjacent the junction between a can body and can end assembly which is clamped between its backing head 27 and its pushing head 33.

Each seaming tool 52 comprises a seaming roller arm 53 which is pivoted to its own pivot support plate 54 by a pin 54a. Each support plate 54 is hinged to its own plate 55 which, in turn, is fixed to the mounting plate 29. The free end of each pivot support plate 54 is provided with a slot 56. A threaded adjusting pin 57 extends through each slot 56.

A cam roller 58 is provided at the free end of each seaming roller arm 53 and the cam rollers 58 engage a

cam track portion 59 of a cam plate 59a during a portion of their travel about the main shaft 16. The cam track 59 is shaped to force each seaming roller arm 53 inwardly toward the turret 15 after each saddle 20 passes its top dead center position. A seaming roller 60 rotatably mounted on each arm 53 between the cam roller 58 and the pivot pin 55 is forced inwardly to progressively crimp the flange 39b.

Each seaming roller arm 53 and its associated seaming roller 60 is normally biased in a position which is out of engagement with the flange 39b as is shown in FIGURE 3A. To this end, a spring 61 is fixed to the free end of each arm 53 and to each plate 55 to bias each arm 53 against an adjustable stop member 62 as is shown in FIGURE 2.

The position and stroke of each seaming roller 60 may be controlled by adjusting the positions of the cam plate 59a and each pivot pin 55 relative to the turret. To this end, the base of the cam plate 59a is provided with bolts 63 which extend through slots 64 and into the base 42. The position of the pivot pins 55 may be adjusted relative to the turret 15 by locknuts 65 which are threaded onto each adjusting pin 57 to clamp each plate 54 in any desired position relative to each adjusting pin 57 and the turret 15.

As each seaming roller 60 approaches, contacts, and crimps each flange 39b over its nested can body mouth, as is progressively shown in FIGURES 3A, 4, 5, and 6, each can body and can end are securely clamped and axially rotated in the previously described manner. After each can body and can end assembly has been seamed (FIGURE 6) each cam roller 58 rides off the end of the cam track 59 and the associated seaming roller 60 is retracted by its spring 61.

After each seaming roller 60 is retracted, the pushing head 33 associated with the crimped can body and can end assembly is withdrawn from its clamping position. To effect this withdrawal a bottom portion of the barrel cam 41 is provided with a recessed cam track portion 40d (FIGURE 1). As each cam roller 51 follows this recessed portion, each shaft 34 and pushing head 33 is withdrawn by their associated springs 49 and 50. The finished can body and can end assemblies drop by gravity from their saddles 20 into a discharge chute 66.

An important aspect of this invention is the fact that the pushing heads are driven by the V-belt 31a only during the working portion of their travel. As may be seen in FIGURE 7 the sheaves 32 are disengaged from the V-belt 31a during the nonproductive portion of their travel.

Although the above description has been directed to a machine for applying a single crimp to the junction between a can end and a can body, it should be appreciated that additional seaming rollers may be provided for performing a double crimping operation.

The invention is not restricted to the slavish imitation of each and every one of the details described above which have been set forth merely by way of example. Obviously devices may be provided which change, eliminate, or add certain specific details without departing from the invention.

What is claimed is:

1. A continuous horizontal can seaming machine comprising the combination of, a support for receiving can closure members and can bodies comprising a turret mounted for axial rotation on a horizontal drive shaft, means defining a multiplicity of equally spaced notches about the periphery of said turret, a vertical chute spaced above said support to deliver can bodies to each notch, said chute being spaced inwardly from one end of said notch so that a first open end of each can body is spaced inwardly from one end of said notch, an axially rotatable backing means spaced from said first open end of each can body received by said notch to define a pocket with said notch and said first open end, means for restraining said backing means against longitudinal movement, means

for axially rotating said backing means, a chute spaced above said support to deliver can closure members to each of said pockets, means to feed can closure members into said chute and to said pockets on a one-to-one basis with said can bodies, each of said notches having a transverse cross section shaped to support a portion of the periphery of said can closure members, each of said can closure members having a peripheral flange which defines a concentric annular land for guidingly engaging said first open end, axially rotatable means axially aligned with said can closure member and said backing means for pushing a second open end of said can body to thereby longitudinally move said can body along said notch to force said first open end against said can closure member and to move said can closure member into rotational contact with said backing means whereby said can closure member will be axially rotated by said backing means and said first open end of the can body will nest on said annular land to thereby lift said first open end of the can body and the can closure member out of contact with the notch, a conical frustum projecting from said axially rotatable means for lifting the second open end of said can body out of contact with the notch and into axial alignment with said backing means, said can closure member, and said axially rotatable means, spring means normally biasing said axially rotatable means out of contact with said second open end, a stationary barrel cam spaced from and in axial alignment with said turret for actuating said axially rotatable means toward said second open end against the bias of said spring means, a seaming tool for progressively crimping the flange of the can closure member over the first open end of the can body, said seaming tool comprising a seaming arm which is pivoted to a point tied for rotational movement with said drive shaft, a seaming roller on one end of said arm, a cam roller on the other end of said arm, means biasing said seaming roller in spaced adjacency from said flange, a stationary cam having a cam track guiding said cam roller to force said arm to pivot about said point whereby said seaming roller is forced inwardly toward the junction to be seamed, and a discharge chute for conveying seamed assemblies of can bodies and closure members from said turret.

2. A continuous horizontal can seaming machine comprising the combination of, a support for receiving can closure members and can bodies, said support having at least one notch for receiving can closure members and can bodies, means to deliver cylindrical can bodies to each notch so that a first open end of each can body is spaced inwardly from one end of said notch, a backing means spaced from said first open end of each can body received by said notch to define a pocket with said notch and said first open end, means for axially rotating said backing means, means to deliver circular can closure members to each of said pockets on a one-to-one basis with said can bodies, each of said notches having a transverse cross section shaped to support a portion of the periphery of said can closure members, each of said can closure members having a peripheral flange which defines a concentric annular land for guidingly engaging said first open end, axially rotatable means axially aligned with said can closure member and said backing means for pushing a second open end of said can body to thereby longitudinally move said can body along said notch to force said first open end against said can closure member and move to said can closure member into rotational contact with said backing means whereby said can closure member will be axially rotated by said backing means and said first open end of the can body will nest on said annular land to thereby lift said first open end of the can body and the can closure member out of contact with the notch, the radial spacing between the can-contacting portion of said notch and the central axes of said backing means and said axially rotatable means being greater than the outside radius of said can body, means on said axially rotatable means for lifting the second open end of

said can body out of contact with the notch and into axial alignment with said backing means, said can closure member, and said axially rotatable means, means for progressively crimping the flange of the can closure member over the first open end of the can body at said concentric annular land, and means for conveying seamed assemblies of can bodies and closure members from said support.

3. A seaming machine for uniting can bodies and can closure members comprising, a support for receiving can closure members and can bodies comprising a turret having a horizontal axis, said turret having at least one peripheral notch for receiving can closure members and can bodies, means to deliver can bodies to each notch so that a first open end of each can body is spaced inwardly from one end of said notch, a backing means spaced from said first open end of each can body received by said notch to define a pocket with said notch and said first open end, means for restraining said backing means against longitudinal movement, means for axially rotating said backing means, means to deliver can closure members to each of said pockets on one-to-one basis with said can bodies, each of said notches having a transverse cross section shaped to support a portion of the periphery of said can closure members, each of said can closure members having a peripheral flange which defines a concentric annular land for guidingly engaging said first open end, axially rotatable means axially aligned with said can closure member and said backing means for pushing a second open end of said can body to thereby longitudinally move said can body along said notch to force said first open end against said can closure member and to move said can closure member into rotational contact with said backing means whereby said can closure member will be axially rotated by said backing means and said first open end of the can body will nest on said annular land to thereby lift said first open end of the can body and the can closure member out of contact with the notch, a conical frustum projecting from said axially rotatable means for lifting the second open end of said can body out of contact with the notch and into axial alignment with said backing means, said can closure member, and said axially rotatable means, means for progressively crimping the flange of the can closure member over the first open end of the can body, and a discharge chute for conveying seamed assemblies of can bodies and closure members from said turret.

4. A can seaming machine comprising, a support for receiving can closure members and can bodies, said support having at least one notch for receiving can closure members and can bodies, a vertical chute spaced above said support to deliver can bodies to each notch, said chute being spaced inwardly from one end of said notch so that a first open end of each can body is spaced inwardly from one end of said notch, a backing means spaced from said first open end of each can body received by said notch to define a pocket with said notch and said first open end, means for axially rotating said backing means, means to deliver can closure members to each of said pockets on a one-to-one basis with said can bodies, each of said notches having a transverse cross section shaped to support a portion of the periphery of said can closure members, each of said can closure members having a peripheral flange which defines a concentric annular land for guidingly engaging said first open end, axially rotatable means axially aligned with said can closure member and said backing means for pushing a second open end of said can body to thereby longitudinally move said can body along said notch to force said first open end against said can closure member and to move said can closure member into rotational contact with said backing means whereby said can closure member will be axially rotated by said backing means and said first open end of the can body will nest on said annular land to thereby lift said first open end of the can body and the can closure member out of contact with the notch, means on said axially rotatable means for lifting the second open end of

said can body out of contact with the notch and into axial alignment with said backing means, said can closure member, and said axially rotatable means, spring means normally biasing said axially rotatable means out of contact with said second open end, cam means for actuating said axially rotatable means toward said second open end against the bias of said spring means, and means for progressively crimping the flange of the can closure member over the first open end of the can body.

5. A seaming machine for uniting can bodies and can closure members comprising, a support for receiving can closure members and can bodies comprising a turret mounted for axial rotation on a horizontal drive shaft, means defining a multiplicity of equally spaced notches about the periphery of said support, means to deliver can bodies to each notch so that a first open end of each can body is spaced inwardly from one end of said notch, a backing means spaced from said first open end of each can body received by said notch to define a pocket with said notch and said first open end, means for restraining said backing means against longitudinal movement, means for axially rotating said backing means, a chute spaced above said support to deliver can closure members to each of said pockets, means to feed can closure members into said chute and to said pockets on a one-to-one basis with said can bodies, each of said notches having a transverse cross section shaped to support a portion of the periphery of said can closure members, each of said can closure members having a peripheral flange which defines a concentric annular land for guidingly engaging said first open end, axially rotatable means axially aligned with said can closure member and said backing means for pushing a second open end of said can body to thereby longitudinally move said can body along said notch to force said first open end against said can closure member and to move said can closure member into rotational contact with said backing means whereby said can closure member will be axially rotated by said backing means and said first open end of the can body will nest on said annular land to thereby lift said first open end of the can body and the can closure member out of contact with the notch, means on said axially rotatable means for lifting the second open end of said can body out of contact with the notch and into axial alignment with said backing means, said can closure member, and said axially rotatable means, a seaming tool for progressively crimping the flange of the can closure member over the first open end of the can body at said concentric annular land, said seaming tool comprising a seaming arm which is pivoted to a point tied for rotational movement with said drive shaft, a seaming roller on one end of said arm, a cam roller on the other end of said arm, means biasing said seaming roller in spaced adjacency from said flange, a stationary cam having a cam track guiding said cam roller to force said arm to pivot about said point whereby said seaming roller is forced inwardly toward the junction to be seamed, and a discharge chute for conveying seamed assemblies of can bodies and closure members from said turret.

6. In a continuous seaming machine the combination of, a support for receiving can closure members and can bodies, said support having at least one notch for receiving can closure members and can bodies, means to deliver can bodies to each notch so that a first open end of each can body is spaced inwardly from one end of said notch, a backing means spaced from said first open end of each can body received by said notch to define a pocket with said notch and said first open end, means for axially rotating said backing means, means to deliver can closure members to each of said pockets on a one-to-one basis with said can bodies, each of said notches having a transverse cross section shaped to support a portion of the periphery of said can closure members, each of said can closure members having a peripheral flange which defines a concentric annular land for guidingly engaging said first open end, axially rotatable means axially aligned with said

can closure member and said backing means for pushing a second open end of said can body to thereby longitudinally move said can body along said notch to force said first open end against said can closure member and to move said can closure member into rotational contact with said backing means whereby said can closure member will be axially rotated by said backing means and said first open end of the can body will nest on said annular land to thereby lift said first open end of the can body and the can closure member out of contact with the notch, means on said axially rotatable means for lifting the second open end of said can body out of contact with the notch and into axial alignment with said backing means, said can closure member, and said axially rotatable means, means for progressively crimping the flange of the can closure member over the first open end of the can body, and means for conveying seamed assemblies of can bodies and closure members from said support.

7. A can seaming machine comprising, a support for receiving can closure members and can bodies comprising a turret having a horizontal axis, said support having at least one notch for receiving can closure members and can bodies, means to deliver can bodies to each notch so that a first open end of each can body is spaced inwardly from one end of said notch, an axially rotatable backing means spaced from said first open end of each can body received by said notch to define a pocket with said notch and said first open end, means for restraining said backing means against longitudinal movement, means for axially rotating said backing means, means to deliver can closure members to each of said pockets on a one-to-one basis with said can bodies, each of said notches having a transverse cross section shaped to support a portion of the periphery of said can closure members, each of said can closure members having a peripheral flange which defines a concentric annular land for guidingly engaging said first open end, axially rotatable means axially aligned with said can closure member and said backing means for pushing a second open end of said can body to thereby longitudinally move said can body along said notch to force said first open end against said can closure member and to move said can closure member into rotational contact with said backing means whereby said can closure member will be axially rotated by said backing means and said first open end of the can body will nest on said annular land to thereby lift said first open end of the can body and the can closure member out of contact with the notch, the radial spacing between the can-contacting portion of said notch and the central axes of said backing means and said axially rotatable means being greater than the outside radius of said can body, means on said axially rotatable means for lifting the second open end of said can body out of contact with the notch and into axial alignment with said backing means, said can closure member, and said axially rotatable means, spring means normally biasing said axially rotatable means out of contact with said second open end, cam means for actuating said axially rotatable means toward said second open end against the bias of said spring means, means for progressively crimping the flange of the can closure member over the first open end of the can body, and a discharge chute for conveying seamed assemblies of can bodies and closure members from said turret.

8. A continuous horizontal can seaming machine comprising the combination of, a support for receiving can closure members and can bodies comprising a turret mounted for axial rotation on a horizontal drive shaft, means defining a multiplicity of equally spaced notches about the periphery of said turret, means to deliver can bodies to each notch so that a first open end of each can body is spaced inwardly from one end of said notch, a backing means spaced from said first open end of each can body received by said notch to define a pocket with said notch and said first open end, means for axially rotating said backing means, means to deliver can closure

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members to each of said pockets on a one-to-one basis with said can bodies, each of said notches having a transverse cross section shaped to support a portion of the periphery of said can closure members, each of said can closure members having a peripheral flange which defines a concentric annular land for guidingly engaging said first open end, axially rotatable means axially aligned with said can closure member and said backing means for pushing a second open end of said can body to thereby longitudinally move said can body along said notch to force said first open end against said can closure member and to move said can closure member into rotational contact with said backing means whereby said can closure member will be axially rotated by said backing means and said first open end of the can body will nest on said annular land to thereby lift said first open end of the can body and the can closure member out of contact with the notch, means on said axially rotatable means for lifting the second open end of said can body out of contact with the notch and into axial alignment with said backing means, said can closure member, and said axially rotatable means, a seaming tool for progressively crimping the flange of the can closure member over the first open end of the can body, said seaming tool comprising a seaming arm which is pivoted to a point tied for rotational movement with said drive shaft, a seaming roller on one end of said arm, a cam roller on the other end of said arm, means biasing said seaming roller in spaced adjacency from said flange, a stationary cam having a cam track guiding said cam roller to force said arm to pivot about said point whereby said seaming roller is forced inwardly toward the junction to be seamed, and a discharge chute for conveying seamed assemblies of can bodies and closure members from said turret.

9. In a continuous seaming machine the combination of, a support for receiving can closure members and can bodies comprising a turret having a horizontal axis, means defining a multiplicity of equally spaced notches about the periphery of said turret, a vertical chute spaced above said support to deliver can bodies to each notch, said chute being spaced inwardly from one end of said notch so that a first open end of each can body is spaced inwardly from one end of said notch, an axially rotatable backing means spaced from said first open end of each can body received by said notch to define a pocket with said notch and said first open end, means for axially rotating said back means, means to deliver can closure members to each of said pockets on a one-to-one basis with said can bodies, each of said notches having a transverse cross section shaped to support a portion of the periphery of said can closure members, each of said can closure members having a peripheral flange which defines a concentric annular land for guidingly engaging said first open end, axially rotatable means axially aligned with said can closure member and said backing means for pushing a second open end of said can body to thereby longitudinally move said can body along said notch to force said first open end against said can closure member and to move said can closure member into rotational contact with said backing means whereby said can closure member will be axially rotated by said backing means and said first open end of the can body will nest on said annular land to thereby lift said first open end of the can body and the can closure member out of contact with the notch, the radial spacing between the can-contacting portion of said notch and the central axes of said backing means and said axially rotatable means being greater than the outside radius of said can body, a conical frustum projecting from said axially rotatable means for lifting the second open end of said can body out of contact with the notch and into axial alignment with said backing means, said can closure member, and said axially rotatable means, means for progressively crimping the flange of the can closure member over the first open end of the can body, and a discharge chute for conveying seamed assemblies of can bodies and closure members from said turret.

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10. A continuous horizontal can seaming machine comprising the combination of, a support for receiving can closure members and can bodies comprising a turret mounted for axial rotation on a horizontal drive shaft, means defining a multiplicity of equally spaced notches about the periphery of said turret, a vertical chute spaced above said support to deliver can bodies to each notch, said chute being spaced inwardly from one end of said notch so that a first open end of each can body is spaced inwardly from one end of said notch, an axially rotatable backing means spaced from said first open end of each can body received by said notch to define a pocket with said notch and said first open end, means for restraining said backing means against longitudinal movement, means for axially rotating said backing means, a chute spaced above said support to deliver can closure members to each of said pockets, means to feed can closure members into said chute and to said pockets on a one-to-one basis with said can bodies, each of said notches having a transverse cross section shaped to support a portion of the periphery of said can closure members, each of said can closure members having a peripheral flange which defines a concentric annular land for guidingly engaged said first open end, axially rotatable means axially aligned with said can closure member and said backing means for pushing a second open end of said can body to thereby longitudinally move said can body along said notch to force said first open end against said can closure member and to move said can closure member into rotational contact with said backing means whereby said can closure member will be axially rotated by said backing means and said first open end of the can body will nest on said annular land to thereby lift said first open end of the can body and the can closure member out of contact with the notch, the radial spacing between the can-contacting portion of said notch and the central axes of said backing means and said axially rotatable means being greater than the outside radius of said can body, a conical frustum projecting from said axially rotatable means for lifting the second open end of said can body out of contact with the notch and into axial alignment with said backing means, said can closure member, and said axially rotatable means, spring means normally biasing said axially rotatable means out of contact with said second open end, a stationary barrel cam spaced from and in axial alignment with said turret for actuating said axially rotatable means toward said second open end against the bias of said spring means, a seaming tool for progressively crimping the flange of the can closure member over the first open end of the can body, said seaming tool comprising a seaming arm which is pivoted to a point tied for rotational movement with said drive shaft, a seaming roller on one end of said arm, a cam roller on the other end of said arm, means biasing said seaming roller in spaced adjacency from said flange, a stationary cam having a cam track guiding said cam roller to force said arm to pivot about said point whereby said seaming roller is forced inwardly toward the junction to be seamed, and a discharge chute for conveying seamed assemblies of can bodies and closure members from said turret.

11. A can seaming machine comprising, a support for receiving can closure members and can bodies, said support having at least one notch for receiving can closure members and can bodies, means to deliver cylindrical can bodies to each notch so that a first open end of each can body is spaced inwardly from one end of said notch, a backing means spaced from said first open end of each can body received by said notch to define a pocket with said notch and said first open end, means for axially rotating said backing means, means to deliver circular can closure members to each of said pockets on a one-to-one basis with said can bodies, each of said notches having transverse cross section shaped to support a portion of the periphery of said can closure members, each of said can closure members having a peripheral flange which defines a concentric annular land for guidingly engaging said first open end, axially rotatable means axial-

ly aligned with said can closure member and said backing means for pushing a second open end of said can body to thereby longitudinally move said can body along said notch to force said first open end against said can closure member and to move said can closure member into rotational contact with said backing means whereby said can closure member will be axially rotated by said backing means and said first open end of the can body will nest on said annular land to thereby lift said first open end of the can body and the can closure member out of contact with the notch, means on said axially rotatable means for lifting the second open end of said can body out of contact with the notch and into axial alignment with said backing means, said can closure member, and said axially rotatable means, means for progressively crimping the flange of the can closure member over the first open end of the can body, and means for conveying seamed assemblies of can bodies and closure members from said support.

12. A seaming machine for uniting can bodies and can closure members comprising, a support for receiving can closure members and can bodies comprising a turret mounted for axial rotation on a horizontal drive shaft, means defining a multiplicity of equally spaced notches about the periphery of said support, a vertical chute spaced above said support to deliver can bodies to each notch, said chute being spaced inwardly from one end of said notch so that a first open end of each can body is spaced inwardly from one end of said notch, a backing means spaced from said first open end of each can body received by said notch to define a pocket with said notch and said first open end, means for restraining said backing means against longitudinal movement, means for axially rotating said backing means, means to deliver can closure members to each of said pockets on a one-to-one basis with said can bodies, each of said notches having a transverse cross section shaped to support a portion of the periphery of said can closure members, each of said can closure members having a peripheral flange which defines a concentric annular land for guidingly engaging said first open end, axially rotatable means axially aligned with said can closure member and said backing means for pushing a second open end of said can body to thereby longitudinally move said can body along said notch to force said first open end against said can closure member and to move said can closure member into rotational contact with said backing means whereby said can closure member will be axially rotated by said backing means and said first open end of the can body will nest on said annular land to thereby lift said first open end of the can body and the can closure member out of contact with the notch, means on said axially rotatable means for lifting the second open end of said can body out of contact with the notch and into axial alignment with said backing means, said can closure member, and said axially rotatable means, spring means normally biasing said axially rotatable means out of contact with said second open end, cam means for actuating said axially rotatable means toward said second open end against the bias of said spring means, a seaming tool for progressively crimping the flange of the can closure member over the first open end of the can body, said seaming tool comprising a seaming arm which is pivoted to a point tied for rotational movement with said drive shaft, a seaming roller on one end of said arm, a cam roller on the other end of said arm, means biasing said seaming roller in spaced adjacency from said flange, a stationary cam having a cam track guiding said cam roller to force said arm to pivot about said point whereby said seaming roller is forced inwardly toward the junction to be seamed, and a discharge chute for conveying seamed assemblies of can bodies and closure members from said turret.

13. A seaming machine for uniting can bodies and can closure members comprising, a support for receiving can closure members and can bodies, said support having at

least one notch for receiving can closure members and can bodies, means to deliver can bodies to each notch so that a first open end of each can body is spaced inwardly from one end of said notch, a backing means spaced from said first open end of each can body received by said notch to define a pocket with said notch and said first open end, means for axially rotating said backing means, means to deliver can closure members to each of said pockets on a one-to-one basis with said can bodies, each of said notches having a transverse cross section shaped to support a portion of the periphery of said can closure members, each of said can closure members having a peripheral flange which defines a concentric annular land for guidingly engaging said first open end, axially rotatable means axially aligned with said can closure member and said backing means for pushing a second open end of said can body to thereby longitudinally move said can body along said notch to force said first open end against said can closure member and to move said can closure member into rotational contact with said backing means whereby said can closure member will be axially rotated by said backing means and said first open end of the can body will nest on said annular land to thereby lift said first open end of the can body and the can closure member out of contact with the notch, the radial spacing between the can-contacting portion of said notch and the central axes of said backing means and said axially rotatable means being greater than the outside radius of said can body, means on said axially rotatable means for lifting the second open end of said can body out of contact with the notch and into axial alignment with said backing means, said can closure member, and said axially rotatable means, means for progressively crimping the flange of the can closure member over the first open end of the can body, and means for conveying seamed assemblies of can bodies and closure members from said support.

14. In a continuous seaming machine the combination of, a support for receiving can closure members and can bodies comprising a turret mounted for axial rotation on a horizontal drive shaft, said support having at least one notch for receiving can closure members and can bodies, means to deliver can bodies to each notch so that a first open end of each can body is spaced inwardly from one end of said notch, a backing means spaced from said first open end of each can body received by said notch to define a pocket with said notch and said first open end, means for restraining said backing means against longitudinal movement, means for axially rotating said backing means, means to deliver can closure members to each of said pockets on a one-to-one basis with said can bodies, each of said notches having a transverse cross section shaped to support a portion of the periphery of said can closure members, each of said can closure members having a peripheral flange which defines a concentric annular land for guidingly engaging said first open end, axially rotatable means axially aligned with said can closure member and said backing means for pushing a second open end of said can body to thereby longitudinally move said can body along said notch to force said first open end against said can closure member and to move said can closure member into rotational contact with said backing means whereby said can closure member will be axially rotated by said backing means and said first open end of the can body will nest on said annular land to thereby lift said first open end of the can body and the can closure member out of contact with the notch, means on said axially rotatable means for lifting the second open end of said can body out of contact with the notch and into axial alignment with said backing means, said can closure member, and said axially rotatable means, a seaming tool for progressively crimping the flange of the can closure member over the first open end of the can body, said seaming tool comprising a seaming arm which is pivoted to a point tied for rotational movement with said drive shaft, a seaming roller on one end of

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said arm, a cam roller on the other end of said arm, means biasing said seaming roller in spaced adjacency from said flange, a stationary cam having a cam track guiding said cam roller to force said arm to pivot about said point whereby said seaming roller is forced inwardly toward the junction to be seamed, and means for conveying seamed assemblies of can bodies and closure members from said support.

15. A can seaming machine comprising, a support for receiving can closure members and can bodies comprising a turret mounted for axial rotation on a horizontal drive shaft, said support having at least one notch for receiving can closure members and can bodies, means to deliver can bodies to each notch so that a first open end of each can body is spaced inwardly from one end of said notch, an axially rotatable backing means from said first open end of each can body received by said notch to define a pocket with said notch and said first open end, means for restraining said backing means against longitudinal movement, means for axially rotating said backing means, means to deliver can closure members to each of said pockets on a one-to-one basis with said can bodies, each of said notches having a transverse cross section shaped to support a portion of the periphery of said can closure members, each of said can closure members having a peripheral flange which defines a concentric annular land for guidingly engaging said first open end, axially rotatable means axially aligned with said can closure member and said backing means for pushing a second open end of said can body to thereby longitudinally move said can body along said notch to force said first open end against said can closure member and to move said can closure member into rotational contact with said backing means whereby said can closure member will be axially rotated by said backing means and said first open end of the can body will nest on said annular land to thereby lift said first open end of the can body and the can closure member out of contact with the notch, means on said axially rotatable means for lifting the second open end of said can body out of contact with the notch and into axial alignment with said backing means, said can closure member, and said axially rotatable means, spring means normally biasing said axially rotatable means out of contact with said second open end, cam means for actuating said axially rotatable means toward said second open end against the bias of said spring means, means for progressively crimping the flange of the can closure member over the first open end of the can body, and a discharge chute for conveying seamed assemblies of can bodies and closure members from said turret.

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16. In a continuous seaming machine the combination of, a support for receiving can closure members and can bodies comprising a turret having a horizontal axis, means defining a multiplicity of equally spaced notches about the periphery of said turret, a vertical chute spaced above said support to deliver can bodies to each notch, said chute being spaced inwardly from one end of said notch so that a first open end of each can body is spaced inwardly from one end of said notch, an axially rotatable backing means spaced from said first open end of each can body received by said notch to define a pocket with said notch and said first open end, means for axially rotating said backing means, means to deliver can closure members to each of said pockets on a one-to-one basis with said can bodies, each of said notches having a transverse cross section shaped to support a portion of the periphery of said can closure members, each of said can closure members having a peripheral flange which defines a concentric annular land for guidingly engaging said first open end, axially rotatable means axially aligned with said can closure member and said backing means for pushing a second open end of said can body to thereby longitudinally move said can body along said notch to force said first open end against said can closure member and to move said can closure member into rotational contact with said backing means whereby said can closure member will be axially rotated by said backing means and said first open end of the can body will nest on said annular land to thereby lift said first open end of the can body and the can closure member out of contact with the notch, a conical frustum projecting from said axially rotatable means for lifting the second open end of said can body out of contact with the notch and into axial alignment with said backing means, said can closure member, and said axially rotatable means, means for progressively crimping the flange of the can closure member over the first open end of the can body at said concentric annular land, and a discharge chute for conveying seamed assemblies of can bodies and closure members from said turret.

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