

E. V. SWANGREN.
CAN BODY FLANGING MACHINE.
APPLICATION FILED DEC. 19, 1906.

948,353.

Patented Feb. 8, 1910.

3 SHEETS—SHEET 1.

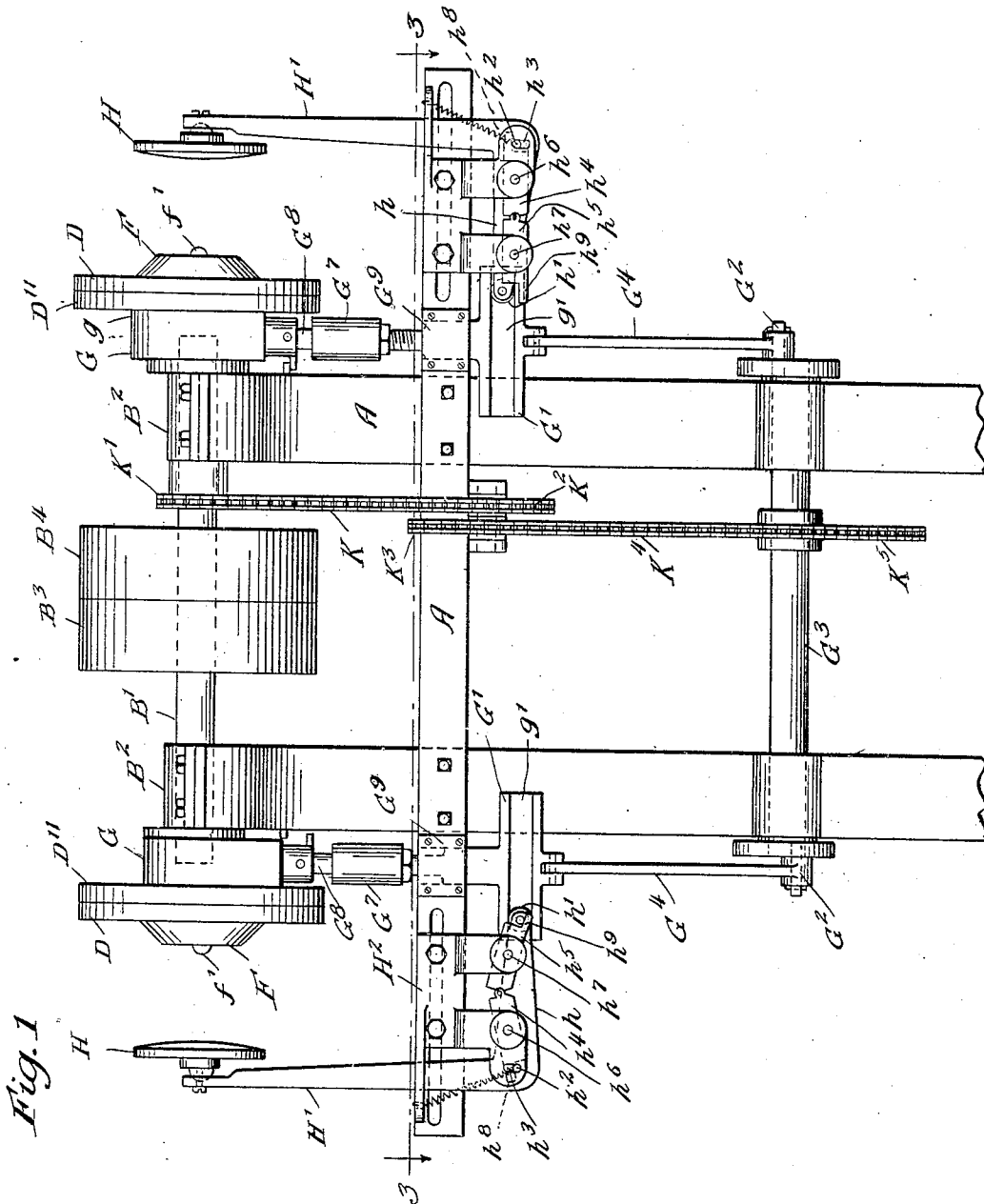


Fig. 1

Witnesses:

Wm. Geiger
H. W. Humday,

Inventor:

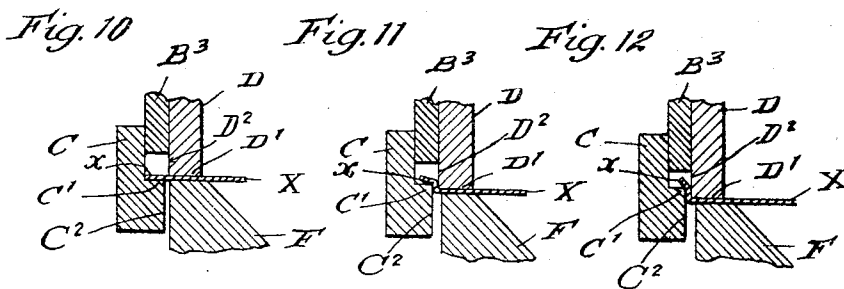
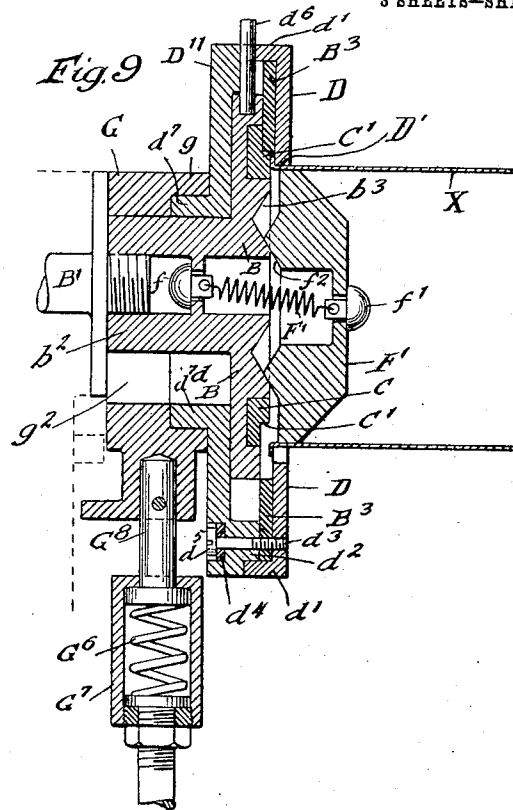
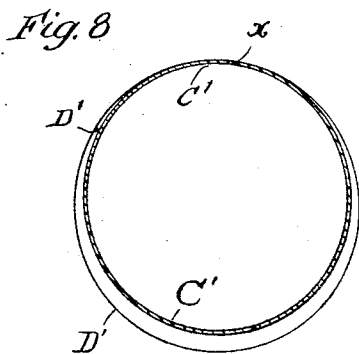
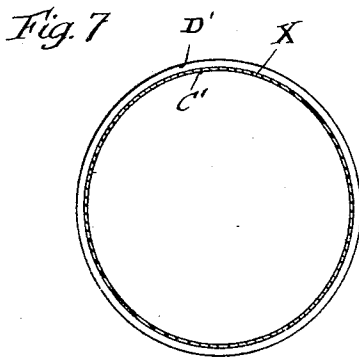
Edwin V. Swangren
By Munday, Evans, Adcock & Co.,
Attorneys.

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3 SHEETS—SHEET 3.



Witnesses:

Wm. G. Seiger
A. M. Munday,

Inventor:

Edwin V. Swangren

By Munday, Quarts, Adcock & Clarke,

Attorneys

UNITED STATES PATENT OFFICE.

EDWIN V. SWANGREN, OF MAYWOOD, ILLINOIS, ASSIGNOR TO AMERICAN CAN COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

CAN-BODY-FLANGING MACHINE.

948,353.

Specification of Letters Patent.

Patented Feb. 8, 1910.

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To all whom it may concern:

Be it known that I, EDWIN V. SWANGREN, a citizen of the United States, residing in Maywood, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Can-Body-Flanging Machines, of which the following is a specification.

My invention relates to improvements in machines for flanging bodies of sheet metal cans or other vessels preparatory to seaming the heads or covers thereon.

The object of my invention is to provide a can body flanging machine of a simple, strong, efficient and durable construction, by means of which the bodies of sheet metal cans or other vessels may be rapidly and cheaply flanged, in which the flanging may be done gradually by a kind of drawing action without injury to the stock, and in which the cooperating flanging disks or tools may separate or yield in respect to each other to accommodate the extra thickness of stock at the side seam of the can body, and by means of which the can bodies may be provided with uniform, true and perfect flanges so that hermetically tight and perfect double seams may be formed by and between the seaming flanges of the can body and of the can body or cover.

My invention consists in the means I employ to practically accomplish this object or result. That is to say, it consists in a pair of rotatable cooperating flanging disks or tools, one having an internal or concave operating face or edge and the other an external or convex flanging face or edge, and one movable or oscillatory in respect to the other, as required to turn the flange.

It also consists in connection with such flanging disks or tools in having one of them slightly separable from and yieldingly held against the other to adapt the same to accommodate the extra thickness of stock at the side seam of the can body, and in combining therewith a yielding or cushioned supporting ring or chuck fitting inside the can body to support the same in true circular form during the flanging operation and movable with the movable flanging disk or tool and mounted on the rotary flanging head which carries the two opposing flanging disks or tools.

My invention also consists in the novel construction of parts and devices and in

the novel combinations of parts and devices herein shown and described and more particularly specified in the claims.

In the accompanying drawing forming a part of this specification, Figure 1 is a side elevation of a can body flanging machine embodying my invention. Fig. 2 is an end view. Fig. 3 is a horizontal section on line 3—3 of Fig. 1. Fig. 4 is a detail central vertical section through one of the flanging heads. Fig. 5 is a detail section on line 5—5 of Fig. 4 and Fig. 6 is a detail face view of the yielding or cushioned can body supporting ring or chuck which is mounted on the rotary flanging head and which fits inside the can body to support the same in true circular shape during the flanging operation. Figs. 7 and 8 are detail diagrammatic face views of the cooperating concave and convex flanging disks or tools; Fig. 9 is a detail sectional view of the flanging tools showing them in different positions from that illustrated in Fig. 4; and Figs. 10, 11 and 12 are detail views illustrating the operation and its gradual or drawing like action in producing the flange.

In the drawing A represents the frame of the machine.

B is a rotary flanging head removably secured by screw threads *b* to its shaft *B*¹, which is journaled in suitable bearings *B*² on the frame of the machine.

C is the convex faced rotary flanging disk or tool which is fixed to the rotary flanging head or immovable in respect thereto, the same fitting in a suitable annular recess *b*¹ in the rotary flanging head B, and having a convex circular shoulder or flanging face or edge *C*¹ fitting inside and engaging the end of the can body X and operating in conjunction with the movable concave flanging disk or tool D to turn the flange *x* on the can body X. This relatively fixed or stationary rotary flanging disk or tool C is secured in place on the rotary flanging head B by a face or wearing plate *B*³ which is preferably of brass or like metal and the inner edge of which overlaps the outer edge of the flanging disk or tool C.

D is the cooperating movable or oscillatory rotary concave flanging disk or tool, having an inside concave operating face or edge *D*¹, the same rotating with and being mounted movably upon the rotary flanging head B, preferably by means of a movable

ring D¹¹ having a circular opening *d* surrounding the hub *b*² of the rotary flanging head B, and to which the flanging disk or tool D is secured by interengaging flanges *d*¹ *d*² and connecting bolts or screws *d*³, rubber or other elastic cushions or springs *d*⁴ being inserted between the ring D¹¹ and the heads *d*⁵ of the bolts *d*³ to enable the tool D to separate slightly or yield laterally in respect to the cooperating tool C sufficiently to accommodate the extra thickness of the stock at the side seam of the can body. The rotary concave flanging disk or tool D is caused to rotate with the flanging head B by a radial guide pin *d*⁶.

F is the yielding or cushioned supporting disk or chuck which fits inside the mouth of the can body X to support the same in true circular shape during the flanging operation and which moves with the movable concave flanging disk or tool D in respect to the rotary flanging head B and flanging disk or tool C while rotating with the rotary flanging head B and flanging disks or tools C D. This supporting chuck or disk F is preferably held yieldingly in position as required by an axially arranged spring F¹, the opposite ends of which are connected to the head B and disk F by connecting buttons *f* *f*¹.

The axial spring F¹ coöperates with annular wedging or tapering grooves or faces *f*² (on the disk F) and *b*³ (on the rotary flanging head B) to hold the can body supporting disk or chuck F yieldingly in position against the thrust of the movable flanging disk or tool D. The flanging tools C D have also parallel faces C² D² respectively at right angles to the convex face C¹ of the tool C and concave face D¹ of the tool D between which parallel faces the flange is received as it is turned or formed on the can body.

The movable concave flanging disk or tool D and the parts which move therewith are given the necessary oscillating movement in respect to the rotary flanging head B, preferably by means of a movable ring or strap G having a slot *g*² and provided with a flange *g* engaging a flange *d*⁷ on the ring D¹¹ and which ring or strap G is connected to a vertically reciprocating slide G¹ actuated by a crank G² on the countershaft G³ through the connecting rod or pitman G⁴. To give a cushioned or yielding action to the movable flanging disk or tool D, a spring G⁵ is preferably interposed between the two parts G⁷ and G⁸ of the connection between the ring or strap G and the slide G¹. The slide G¹ reciprocates in a suitable guide G⁹ on the frame of the machine, and it is provided with a horizontally extending slot or guideway *g*¹ through which motion is communicated to the chuck or clamp disk H by which the can body X is clamped upon the rotary flanging head B

and the yielding or movable can body supporting disk or chuck F carried thereby.

To give the can body clamping or chucking disk H the necessary in and out movement to clamp the can body and also the necessary up and down movement with the movable flanging disk or tool D and yielding can body supporting chuck or disk F, the disk H is mounted upon an inwardly swinging and vertically movable lever H¹ having a bent arm *h* furnished with a roller *h*¹ fitting in and engaging the horizontal guide *g*¹ of the slide G¹ and which is movably connected to a stationary bracket H² on the frame by a pin *h*² extending through a vertical slot *h*³ in the bracket H². The first portion of the downward movement of the slide G¹ thus causes the arm H¹ to swing inward toward the rotary flanging head B about the pivot *h*² as a center and thus clamps the can body, and the further downward movement of the slide G¹ is then caused to impart a parallel downward movement to the clamp or chuck H and its operating arm H¹ by reason of the slot *h*³. Locking and releasing levers *h*⁴ *h*⁵ pivoted at *h*⁶ *h*⁷ to the stationary bracket H² and pivotally connected together at their meeting ends, the lever *h*⁴ having a lip *h*⁸ overhanging the pivot pin *h*² and the lever *h*⁵ having a lip *h*⁹ projecting under and engaging the pivot of the roller *h*¹ serve to lock the lever H¹ in its closed position while permitting it to move down with the flanging disk D and can body chuck or support F, and serve, on the upward or opening movement of the slide G¹, to permit the arm H¹ and clamp disk H to swing outward to release the can.

The driving shaft B¹ is furnished with fast and loose driving pulleys B³ B⁴ and motion is communicated therefrom to the shaft G³ through the connecting chains and sprocket wheels K K¹ K² K³ K⁴ K⁵. The machine is preferably made double or with two rotating flanging heads, one on each end of the shaft B¹ and the other coöperating parts being, of course, duplicated.

I claim:—

1. In a flanging machine, the combination with a rotary flanging head, of concave and convex faced flanging tools mounted on and rotating with said heads, and one engaging the can body on the outside and the other on the inside, said flanging tools having also parallel faces between which the flange is received as it is formed, substantially as specified.

2. In a can body flanging machine, a pair of rotary coöperating flanging tools mounted the one on the other, and the one to oscillate in respect to the other while rotating together, one engaging the can body on the inside and the other on the outside, one having a convex operating face or edge and the

other a concave operating face or edge, said flanging tools having also parallel faces between which the flange is received as it is formed, substantially as specified.

5 3. In a flanging machine, the combination with a rotary flanging head having a convex faced flanging tool mounted on said head and rotating therewith, of a coöperative rotary flanging disk mounted on said head and
10 rotating therewith and having a concave operating face, said flanging tool and disk having also parallel faces between which the flange is received as it is formed, substantially as specified.

15 4. In a flanging machine, the combination with a rotary flanging head having a flanging tool mounted thereon and rotating therewith and engaging the can body on the inside, of a coöperating oscillating flanging
20 tool having an inside or concave operating face or edge, said flanging tools having also parallel faces between which the flange is received as it is formed, substantially as specified.

25 5. In a flanging machine, the combination with a rotary flanging head having a flanging tool mounted thereon and rotating therewith and engaging the can body on the inside, of a coöperating oscillating flanging
30 tool mounted on said head to rotate therewith and engaging the can body on the outside and having a concave operating face or edge, and a can body supporting chuck adapted to move with one of said flanging
35 tools, substantially as specified.

6. In a flanging machine, the combination with a rotary flanging head, of a convex faced flanging tool mounted thereon and rotating therewith and engaging the can body
40 on the inside, a coöperating concave faced flanging tool mounted on said head to rotate therewith and engaging the can body on the outside and a can body supporting chuck both mounted movably on said rotary flanging
45 head, substantially as specified.

7. In a flanging machine, the combination with a rotary flanging head having a convex faced flanging tool secured thereto and engaging the can body on the inside,
50 of a coöperating rotary concave faced flanging tool mounted movably on said rotary head and engaging the can body on the outside and a can body supporting chuck mounted movably on said rotary head, substantially
55 as specified.

8. In a flanging machine, the combination with a rotary flanging head having a convex faced flanging tool secured thereto, of a coöperating rotary concave faced flanging
60 tool mounted movably on said rotary head and a can body supporting chuck mounted movably on said rotary head, said rotary flanging head and can body supporting chuck having coöperating wedging faces,
65 substantially as specified.

9. In a flanging machine, the combination with a rotary flanging head having a convex faced flanging tool secured thereto, of a coöperating rotary concave faced flanging
70 tool mounted movably on said rotary head and a can body supporting chuck mounted movably on said rotary head, said rotary flanging head and can body supporting chuck having coöperating wedging faces,
75 and a spring connecting said rotary head and can body supporting chuck or disk, substantially as specified.

10. In a flanging machine, the combination with a rotary can body supporting chuck, of a pair of rotary flanging disks
80 mounted to rotate with said chuck, one having an internal and the other an external operating face, said flanging disks having also parallel faces between which the flange is received as it is formed, substantially
85 as specified.

11. In a flanging machine, the combination with a rotary flanging head having a flanging tool fixed thereto, of a coöperating
90 flanging tool mounted movably on said rotary head and a movable can body supporting chuck or disk mounted on said rotary head and movable with said movable flanging disk or tool, substantially as specified.

12. In a can body flanging machine, the combination with a rotary flanging head
95 having a flanging tool, of a coöperating flanging tool and can body supporting chuck both mounted movably on said rotary flanging head, substantially as specified.

13. In a can body flanging machine, the combination with a rotary flanging head
100 having a flanging tool, of a coöperating flanging tool and can body supporting chuck both mounted movably on said rotary flanging head, said rotary flanging head and can body supporting chuck having coöperating annular wedging faces, substantially as
105 specified.

14. In a can body flanging machine, the combination with a rotary flanging head
110 having a flanging tool, of a coöperating flanging tool and can body supporting chuck both mounted movably on said rotary flanging head, said rotary flanging head and can body supporting chuck having coöperating
115 annular wedging faces and a spring connecting said rotary flanging head and can body supporting chuck or disk, substantially as specified.

15. In a can body flanging machine, the combination with a rotary flanging head
120 having a flanging tool, of a coöperating flanging tool and can body supporting chuck, both mounted movably on said rotary flanging head, and a connecting spring, substantially
125 as specified.

16. In a flanging machine, the combination with an outer concave faced flanging
130 tool engaging the can body on the inside

of an inner convex faced rotary flanging tool engaging the can body on the inside and rotating on an axis parallel to the can body, and means for oscillating one of said flanging tools in respect to the other, said flanging tools having parallel faces to receive the flange as it is formed, substantially as specified.

17. In a flanging machine, the combination with a rotary flanging head having a pair of cooperating flanging tools mounted thereon, of a movable supporting chuck for the can body, and a spring for holding said supporting chuck yieldingly against the rotary flanging head, substantially as specified.

18. The combination with a rotary flanging head, of rotary flanging tools mounted thereon, one movable in respect to the other, and a yielding supporting chuck adapted to move with the movable flanging tool on said rotary head, substantially as specified.

19. The combination with a rotary flanging head, of rotary flanging tools mounted thereon, one movable in respect to the other, and a movable supporting chuck adapted to move with the movable flanging tool on said rotary head, and a spring for holding it yieldingly in position, substantially as specified.

20. The combination with a rotary flanging head, of rotary flanging tools mounted thereon, one movable in respect to the other, and a yielding supporting chuck adapted to move with the movable flanging tool on said rotary head, said supporting chuck and said rotary head having cooperating wedging meeting faces, substantially as specified.

21. The combination with a rotary flanging head, of rotary flanging tools mounted thereon, one movable in respect to the other,

and a yielding supporting chuck adapted to move with the movable flanging tool on said rotary head, said supporting chuck and said rotary head having cooperating wedging meeting faces, and a spring for holding them yieldingly together, substantially as specified.

22. The combination with a rotary flanging head, of rotary flanging tools mounted thereon, one movable in respect to the other, and a movable supporting chuck adapted to move with the movable flanging tool on said rotary head, and means for holding said flanging tools yieldingly against separation to enable the same to accommodate the extra thickness of stock at the side seam of the vessel being flanged, substantially as specified.

23. In a flanging machine, the combination with a rotary flanging head having a flanging tool fixed thereto, of a cooperating flanging disk or tool mounted movably on said rotary head and a cushioned can body supporting chuck mounted on said rotary head and movable with said movable flanging tool, and an opening and closing can body clamp movable with said movable flanging tool and can body supporting chuck, substantially as specified.

24. The combination with a rotary flanging head, of rotary flanging tools mounted thereon, one movable in respect to the other, and a movable supporting chuck adapted to move with the movable flanging tool on said rotary head, said supporting chuck and said rotary head having cooperating wedging meeting faces, substantially as specified.

EDWIN V. SWANGREN.

Witnesses:

EDMUND ADCOCK,
H. M. MUNDAY.