

F. RUDOLPHI.
 AUTOMATIC CAN BODY FLANGING MACHINE.
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3 SHEETS—SHEET 1.

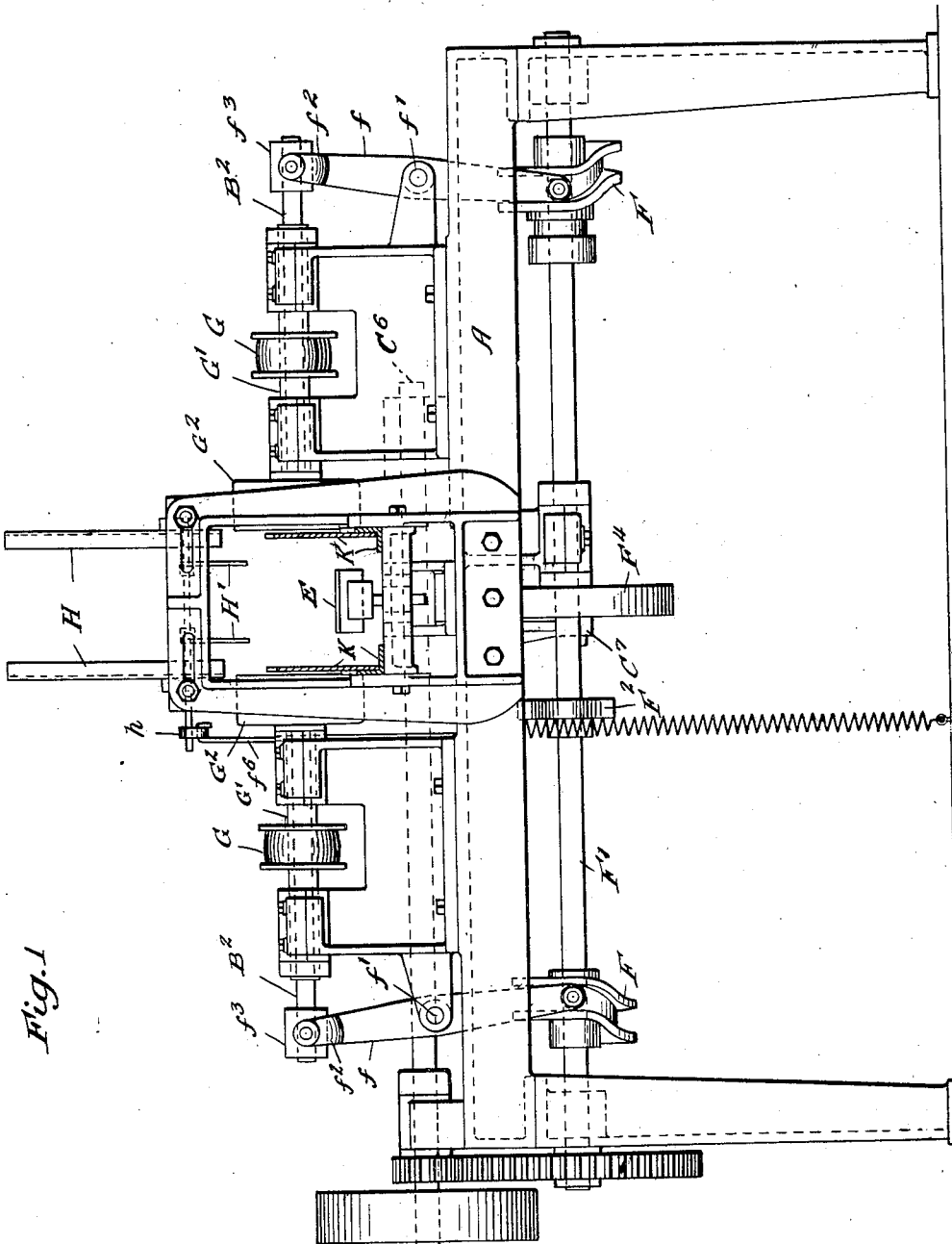


Fig. 1

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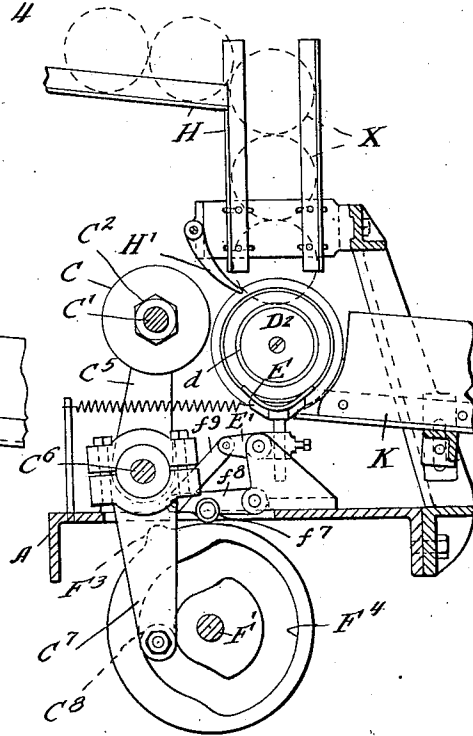
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3 SHEETS—SHEET 3.

Fig. 4



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UNITED STATES PATENT OFFICE.

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AUTOMATIC CAN-BODY-FLANGING MACHINE.

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Specification of Letters Patent.

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To all whom it may concern:

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

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

The object of my invention is to provide an automatic machine of a simple, strong, efficient and durable construction by means of which can bodies may be automatically, rapidly and cheaply flanged, at both ends if desired, and whereby the flanging may be done uniformly, perfectly and truly to the end that hermetically tight and perfect double seams may be formed when the heads or covers are seamed upon the can bodies.

My invention consists in the means I employ to practically accomplish this object or result. That is to say, it consists in connection with a chute or runway for the can bodies, of a feeder for the can bodies for delivering them one by one to the flanging devices, a can body support for holding the fed can body in position to be engaged by the rotary flanging heads, a pair of reciprocating rotary heads, one or both furnished with flanging disks or tools according as it is desired to flange one or both ends of the can body, one or both of said rotary heads being also provided with a yielding or cushioned supporting ring or chuck adapted to fit inside the open mouth of the can body and to support the same in true circular form against the thrust of the flanging tool or roller while permitting the can body to yield or move with such flanging tool or roller in respect to the rotary head and the flanging tool or disk mounted on such head, as required in carrying out the flanging operation.

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.

In the accompanying drawing forming a part of this specification, Figure 1 is a side elevation of an automatic can body flanging machine embodying my invention. Fig. 2 is a plan view. Fig. 3 is a detail vertical

section on the broken line 3—3 of Fig. 2. Fig. 4 is a detail vertical section on the broken line 4—4 of Fig. 2. Fig. 5 is a detail central section through the rotary flanging heads and Fig. 6 is a view similar to Fig. 5 showing the machine as used for flanging only one end of the can body, the flanging ring or tool on one of the rotary heads being removed and replaced by a can holding chuck.

In the drawing A represents the frame of the machine.

B B are a pair of reciprocating rotary flanging heads, each furnished with a flanging ring or tool B¹ having a shoulder b adapted to fit inside the mouth α of the body X of the can or vessel about to be flanged and to cooperate with the external rotary flanging tool or roller C in turning the flange upon the open or mouth end of the can body as the flanging tools or rollers C C are moved radially toward the rotating can body on the flanging heads B B. In order to cause the flange to be truly, uniformly and perfectly formed on the can body, I provide each of the rotary flanging heads B with cushioned movable or yielding can body supporting rings or chucks D, which fit inside the open ends of the body of the can or vessel and support it in true circular shape during the flanging operation. Each of the supporting rings or chucks D is furnished with a cushion or spring D¹, preferably of rubber and surrounding the hub b¹ on the flanging head B, and which rubber or cushion gives the supporting ring or chuck a spring support and enables it to yield against the thrust of the cooperating flanging tool or roller C and move therewith as this tool or roller moves toward the flanging head B. Each of the rotary flanging heads B is also provided with a guide ring or disk D² to keep the cushioned chuck ring D in place and guide its movement. Each of the flanging rings or tools B¹ on each of the rotary heads B has a flange or shoulder b² to serve as a stop for the end of the can body to abut against and to limit the width of the flange to be formed on the can body. Each of the can body supporting rings or chucks D has a conical or tapering face d to adapt the same to enter the open mouth of the can body and to lift the can body from the can body support E when the rotary flanging heads approach each other and each of the

guide flanges or disks D^2 is also provided with a conical or tapering face d^1 for the same purpose. Each of the rotary heads B is removably secured to its reciprocating and rotating shaft B^2 by screw threads b^3 so that the same may be readily removed and replaced by another head of different size for operating upon can bodies of different diameters. The rotary flanging heads B are reciprocated as required, by means of cams F on the cam shaft F^1 through the levers f pivoted to the frame at f^1 and having forks f^2 at their upper ends engaging collars f^3 on the rotary flanging head shaft B^2 . The rotary flanging head B is given its requisite rotary movement by means of a pulley G on the hollow shaft or sleeve G^1 carrying a head G^2 having slots g engaging guide pins g^1 on the rotary head B to cause said head to rotate with the sleeve or hollow shaft G.

H is the can body feed chute or passage along or down which the can bodies roll or pass to the can body holder E, arranged below and between the rotary and reciprocating flanging heads B B; and H^1 is a can body feeder by which the can bodies are released or fed one by one from the feed chute and caused to drop down upon the holder E. K is the can body discharge chute into which the flanged can bodies are delivered and by which they are discharged from the machine.

The can body holder or support E is preferably movably mounted so that it may also serve as a can body ejector for discharging the can bodies into the discharge chute.

The can body feeder H^1 preferably consists of a vibrating arm adapted to engage the lowermost can body in the chute H and support the same until released by the backward or withdrawing movement of the feeder. The feeder H^1 is preferably vibrated as required to feed the can bodies one by one to the support E by means of a cam F^2 on the cam shaft F^1 engaging the roller f^4 on the lever f^5 which is connected by a link f^6 with an arm h on the can body feeder H^1 . The can body supporting and ejecting device E is preferably operated as required by means of a cam F^3 on the cam shaft F^1 engaging a roller f^7 on the lever f^8 which is connected by a link f^9 with the lever E^1 upon which the can body holder and ejector E is mounted.

In the modification illustrated in Fig. 6, one of the rotary heads B is furnished with a can body holding chuck or ring D^3 adapted to fit and engage one end of the can, the same being mounted upon the head B and cooperating with the rubber or elastic cushion D^1 , the same as the supporting ring D, where both rotary heads are furnished with flanging rings or tools B^1 instead of the can body holding chuck D^3 .

The flanging tools or rollers C are preferably adjustably connected to their rotating supporting shaft C^1 by means of jam-nuts C^2 C^2 which engage screw threads C^3 on the shaft C^1 . The rotatable shaft C^1 is journaled in suitable bearings C^4 on a rocking or swinging frame C^5 pivotally connected to the main frame at C^6 and having an operating arm C^7 carrying a roller C^8 engaging a cam F^4 on the cam shaft F^1 by means of which the flanging tools or rollers C C are automatically actuated as required.

I claim—

1. In an automatic flanging machine, the combination with a can body feed chute or runway, of a can body feeder, a can body support, a pair of reciprocating and rotary flanging heads furnished with flanging tools and with movable cushioned chucks fitting inside the body of the vessel to be flanged to support the same in true shape during the flanging operation, a pair of movable flanging tools cooperating with the flanging tools on the rotary flanging heads, a can body discharge chute, means for automatically rotating and reciprocating the rotary flanging heads, means for automatically operating the movable flanging tools, means for automatically operating the can body support to eject the flanged can bodies, and means for automatically operating the can body feeder, substantially as specified.

2. In an automatic can body flanging machine, the combination with a can body chute or runway, of a can body feeder, a can body support and a pair of rotary and reciprocating flanging heads furnished with flanging tools and yielding can body supporting chucks, and cooperating movable flanging tools, said can body support being between the flanging heads and supporting the can body in position to be grasped by said flanging heads as they approach each other, said can body cooperating with the other parts to permit the can body to move laterally during the flanging operation, substantially as specified.

3. In a flanging machine, the combination with a can body feeder, of a pair of rotary and reciprocating flanging heads, and a can body support between said flanging heads upon which the can bodies are delivered by said feeder in position to be grasped by said flanging heads as they reciprocate toward each other, said can body cooperating with the other parts to permit the can body to move laterally during the flanging operation, substantially as specified.

4. In a flanging machine, the combination with a can body feeder, of a pair of rotary and reciprocating flanging heads furnished with flanging tools and yielding can body supporting chucks, and a can body support between said flanging heads upon which the can bodies are delivered by said feeder in

position to be grasped by said flanging heads as they reciprocate toward each other, said can body cooperating with the other parts to permit the can body to move laterally during the flanging operation, substantially as specified.

5. In a flanging machine, the combination with a can body feeder, of a pair of rotary and reciprocating flanging heads furnished with flanging tools and movable can body supporting chucks and cooperating movable flanging tools, and a can body support between said flanging heads upon which the can bodies are delivered by said feeder in position to be grasped by said flanging heads as they reciprocate toward each other, said can body cooperating with the other parts to permit the can body to move laterally during the flanging operation, substantially as specified.

6. In a flanging machine, the combination with a can body feeder, of a pair of rotary and reciprocating flanging heads furnished with flanging tools and yielding can body supporting chucks and cooperating movable flanging tools and an ejector device for the flanged can bodies, and a can body support between said flanging heads upon which the can bodies are delivered by said feeder in position to be grasped by said flanging heads as they reciprocate toward each other, said can body cooperating with the other parts to permit the can body to move laterally during the flanging operation, substantially as specified.

7. In a flanging machine, the combination with a can body feeder, of a can body support and a pair of rotary and reciprocating flanging heads, said can body support being between the flanging heads and supporting the can body in position to be grasped by said flanging heads as they approach each other, said can body cooperating with the other parts to permit the can body to move laterally during the flanging operation, substantially as specified.

8. In a flanging machine, the combination with a can body feeder, of a can body support and a pair of rotary and reciprocating flanging heads furnished with flanging tools and yielding can body supporting chucks, said can body support being between the flanging heads and supporting the can body in position to be grasped by said flanging heads as they approach each other, said can body cooperating with the other parts to permit the can body to move laterally during the flanging operation, substantially as specified.

9. In a flanging machine, the combination with a can body feeder, of a can body support and a pair of rotary and reciprocating flanging heads furnished with flanging tools and movable can body supporting chucks, and cooperating movable flanging tools,

said can body support being between the flanging heads and supporting the can body in position to be grasped by said flanging heads as they approach each other, said can body cooperating with the other parts to permit the can body to move laterally during the flanging operation, substantially as specified.

10. In a flanging machine, the combination with a can body feeder, of a can body support and a pair of rotary and reciprocating flanging heads furnished with flanging tools and yielding can body supporting chucks, cooperating movable flanging tools, and means for operating the can body support to eject the flanged can bodies, said can body support being between the flanging heads and supporting the can body in position to be grasped by said flanging heads as they approach each other, said can body cooperating with the other parts to permit the can body to move laterally during the flanging operation, substantially as specified.

11. In a flanging machine, the combination with a can body support, of a pair of rotary and reciprocating flanging heads having tapering meeting faces to lift the can body from the support, said can body cooperating with the other parts to permit the can body to move laterally during the flanging operation, substantially as specified.

12. In a flanging machine, the combination with a can body support, of rotary and reciprocating flanging heads furnished with flanging tools, and yielding can body supporting chucks, said can body support being between the flanging heads and supporting the can body in position to be grasped by said flanging heads as they approach each other, said can body cooperating with the other parts to permit the can body to move laterally during the flanging operation, substantially as specified.

13. In a flanging machine, the combination with a can body support, of rotary and reciprocating flanging heads furnished with flanging tools, movable can body supporting chucks and cooperating movable flanging tools, said can body support being between the flanging heads and supporting the can body in position to be grasped by said flanging heads as they approach each other, said can body cooperating with the other parts to permit the can body to move laterally during the flanging operation, substantially as specified.

14. In a flanging machine, the combination with a rotary head, of an opposing rotary and reciprocating flanging head, a can body support between said flanging heads and a feeder for automatically delivering the can bodies upon said support in position to be grasped by said heads as said reciprocating flanging head approaches the other head, said can body cooperating with the

other parts to permit the can body to move laterally during the flanging operation, substantially as specified.

15. In a flanging machine, the combination with a rotary head, of an opposing rotary and reciprocating flanging head, and means for supporting a can body between said rotary heads in position to be grasped thereby as the reciprocating head approaches the other, said can body cooperating with the other parts to permit the can body to move laterally during the flanging operation, substantially as specified.

16. In a flanging machine, the combination with a rotary head, of an opposing rotary and reciprocating flanging head, and means for supporting a can body between said rotary heads in position to be grasped thereby as the reciprocating head approaches the other, said flanging head being provided with a flanging tool and with a yielding can body supporting chuck, said can body cooperating with the other parts to permit the can body to move laterally during the flanging operation, substantially as specified.

17. In a flanging machine, the combination with a rotary head, of an opposing rotary and reciprocating flanging head, and means for supporting a can body between said rotary heads in position to be grasped thereby as the reciprocating head approaches the other, said flanging head being provided with a flanging tool and with a movable can body supporting chuck, and a cooperating movable flanging tool, said can body cooperating with the other parts to permit the can body to move laterally during the flanging operation, substantially as specified.

18. In a flanging machine, the combination with a rotary head, of an opposing rotary and reciprocating flanging head, and means for supporting a can body between said rotary heads in position to be grasped thereby as the reciprocating head approaches the other, said flanging head being provided with a flanging tool and with a yielding can body supporting chuck, a cooperating movable flanging tool, and a can body feeder, said can body cooperating with the other parts to permit the can body to move laterally during the flanging operation, substantially as specified.

19. The combination with a can body feeder, of a pair of rotary heads, means for

reciprocating one of said heads, one of said heads being furnished with a flanging tool and a movable can body supporting chuck, said can body cooperating with the other parts to permit the can body to move laterally during the flanging operation, substantially as specified.

20. The combination with a can body feeder, of a pair of rotary heads, means for reciprocating one of said heads, one of said heads being furnished with a flanging tool and a yielding can body supporting chuck, and a cooperating flanging tool, a can body support between said flanging heads and a feeder for automatically delivering the can bodies upon said support in position to be grasped by said heads as said reciprocating flanging head approaches the other head, said can body cooperating with the other parts to permit the can body to move laterally during the flanging operation, substantially as specified.

21. The combination with a can body feeder, of a pair of rotary heads, means for reciprocating one of said heads, one of said heads being furnished with a flanging tool and a movable can body supporting chuck, a cooperating flanging tool, and means for ejecting the flanged can body, a can body support between said flanging heads and a feeder for automatically delivering the can bodies upon said support in position to be grasped by said heads as said reciprocating flanging head approaches the other head, said can body cooperating with the other parts to permit the can body to move laterally during the flanging operation, substantially as specified.

22. The combination with a can body feeder, of a pair of rotary heads, means for reciprocating one of said heads, one of said heads being furnished with a flanging tool, a yielding can body supporting chuck, a cooperating flanging tool, means for ejecting the flanged can body, and a discharge chute, said can body cooperating with the other parts to permit the can body to move laterally during the flanging operation, substantially as specified.

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Witnesses:

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