H. L. GUENTHER.

CAN HEAD LINING AND ROLLING MACHINE.

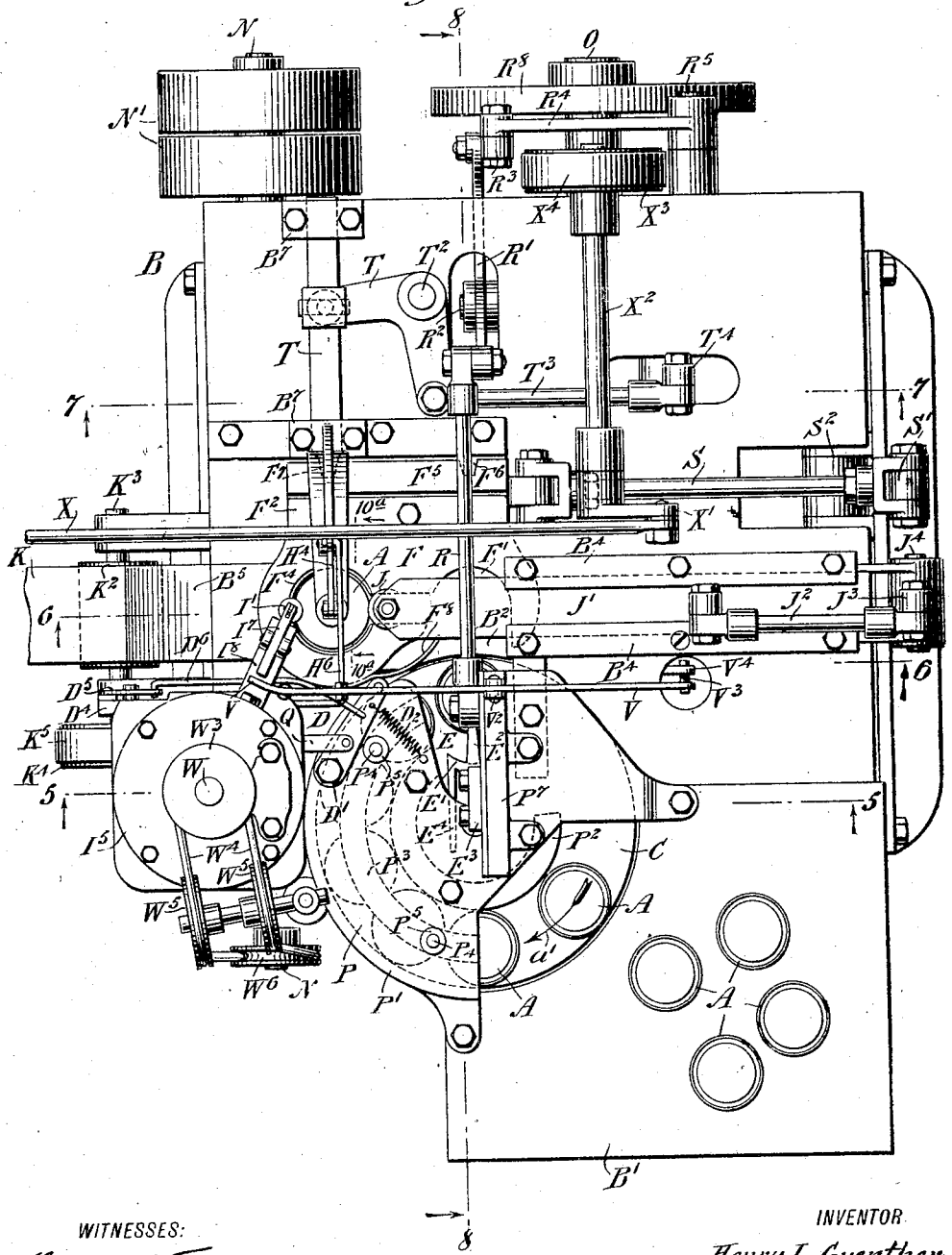
APPLICATION FILED JUNE 16, 1910.

1,046,291.

Patented Dec. 3, 1912.

12 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

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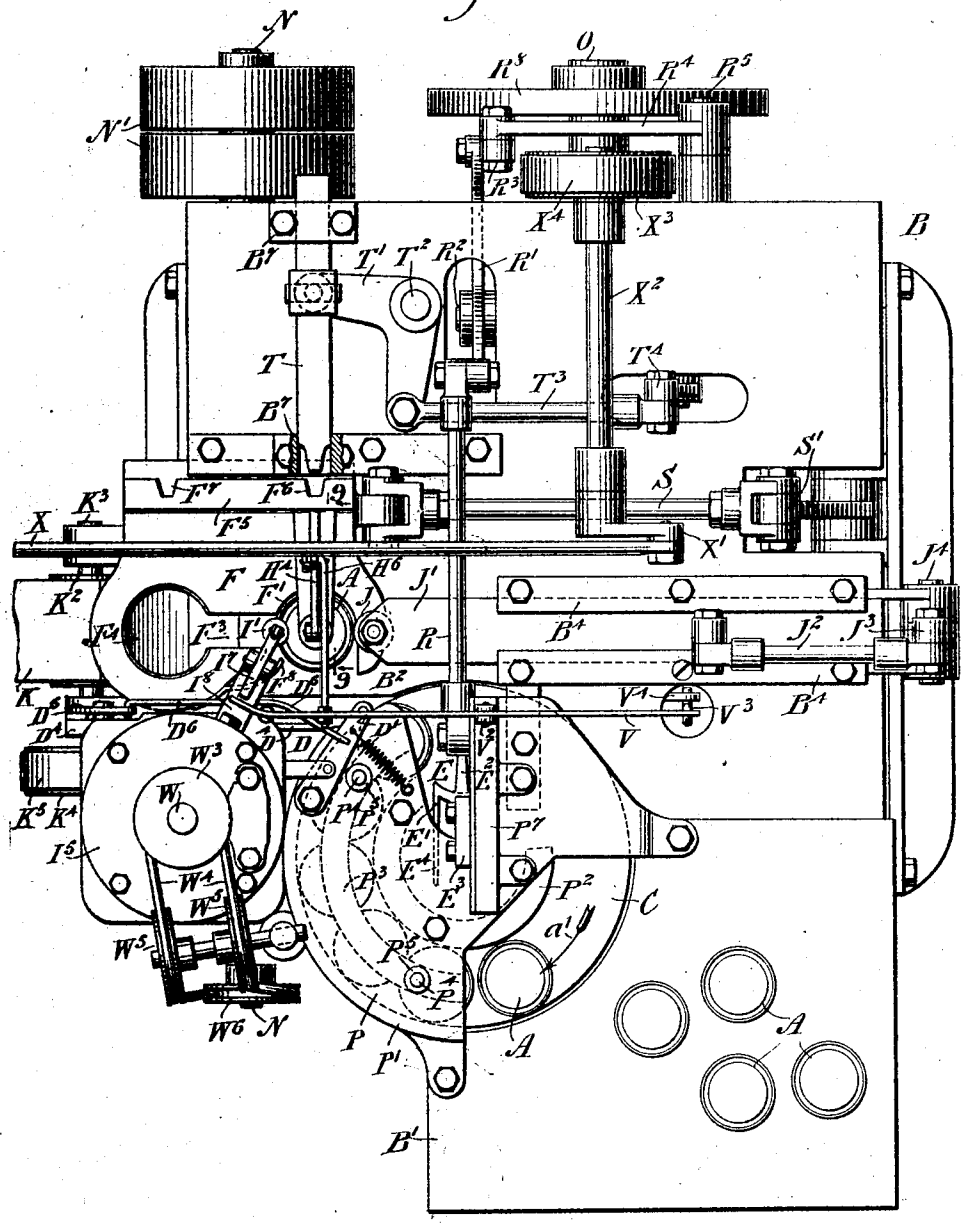
Fig. 2.



WITNESSES:

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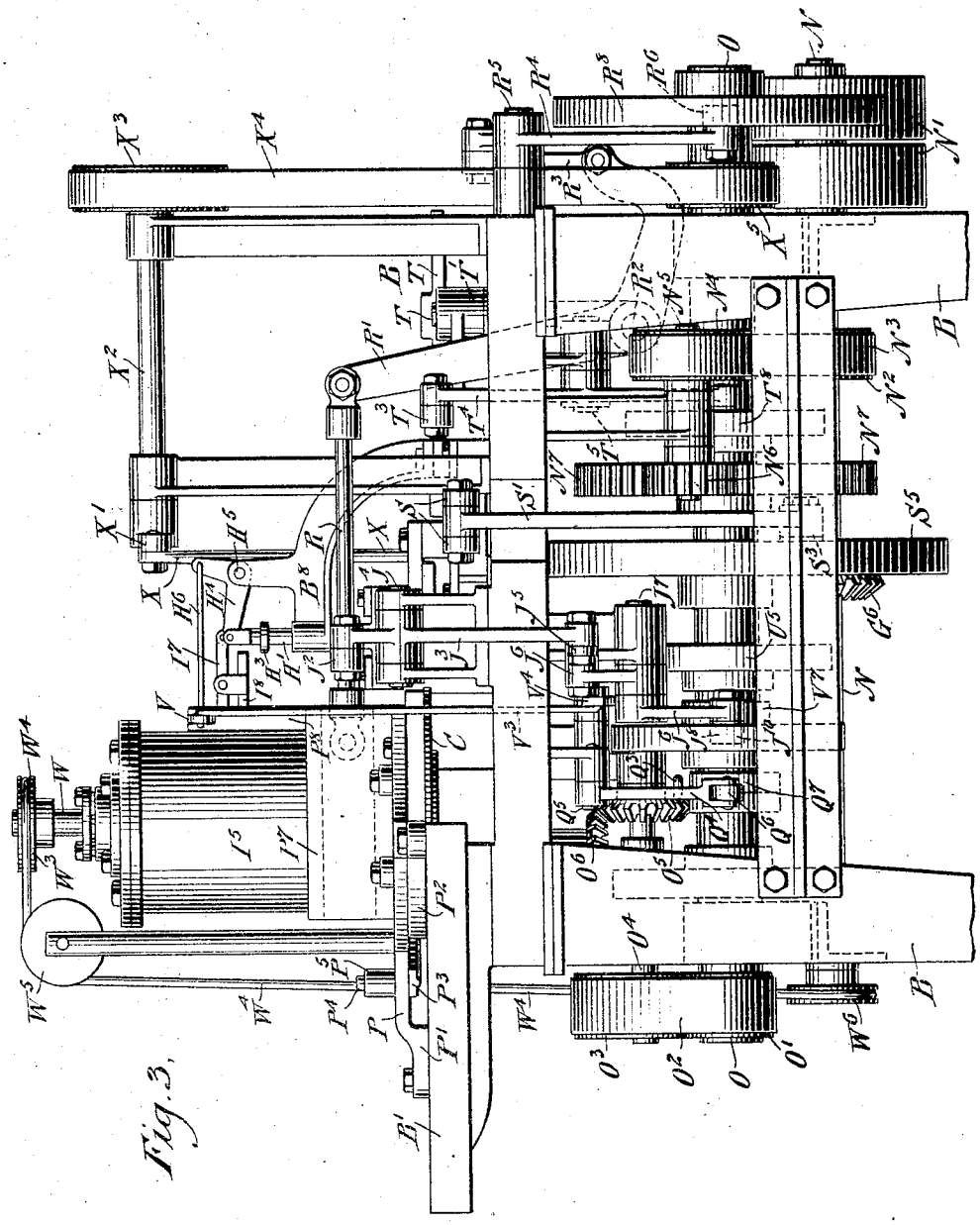

Fig. 3.

WITNESSES:

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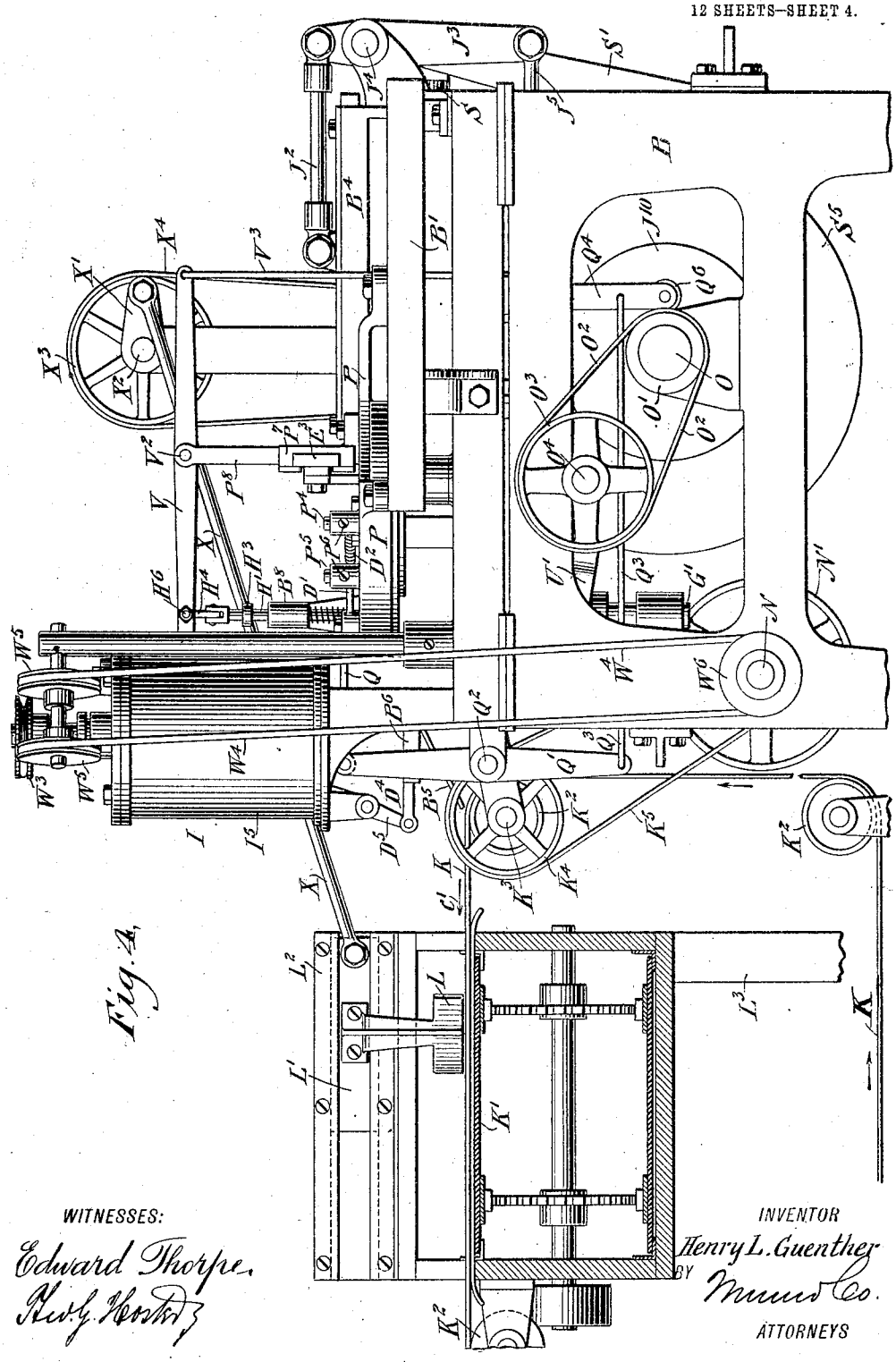

Fig. 4.

WITNESSES:

Edward Thorpe.

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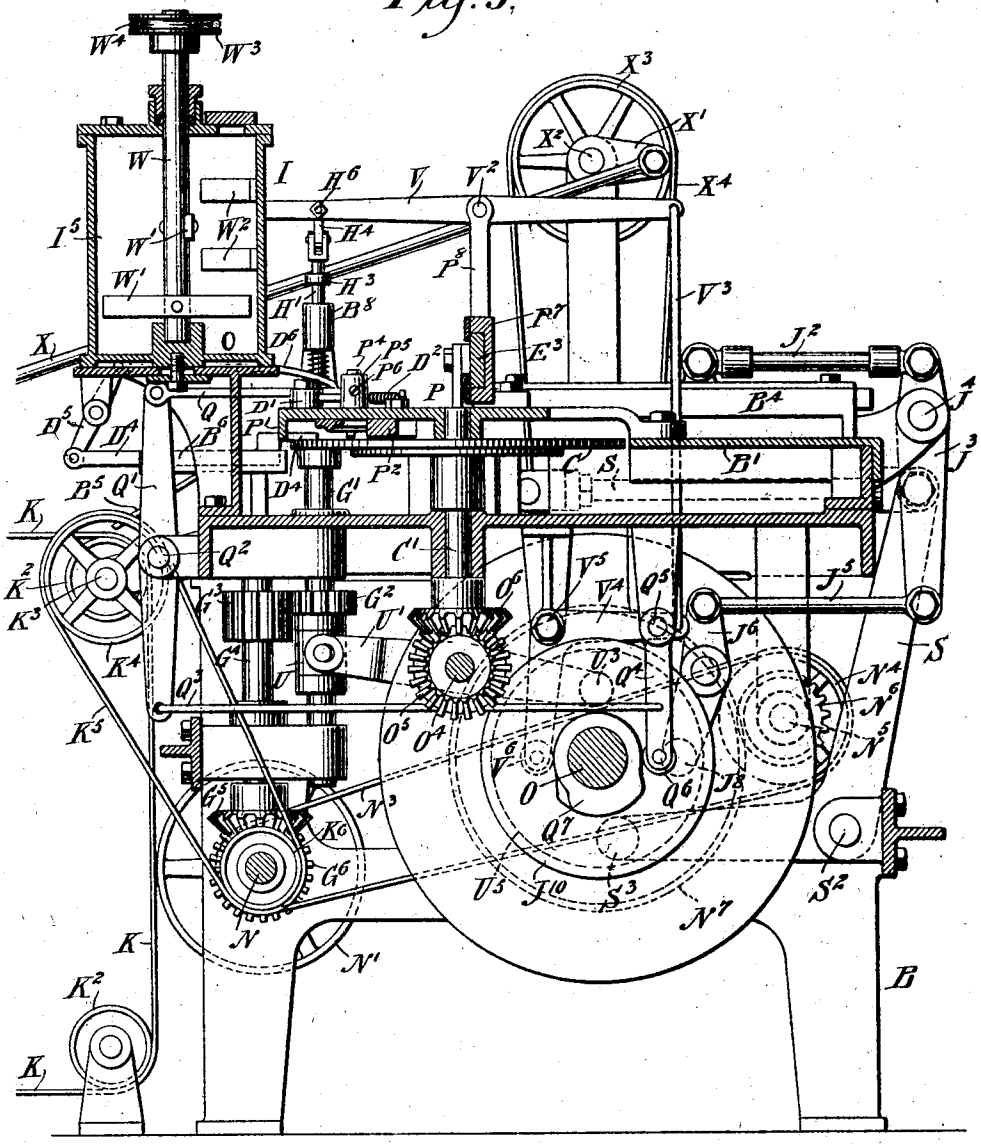
12 SHEETS—SHEET 5.

Fig. 5.



WITNESSES:

Edward Thory

Ruby Hunter

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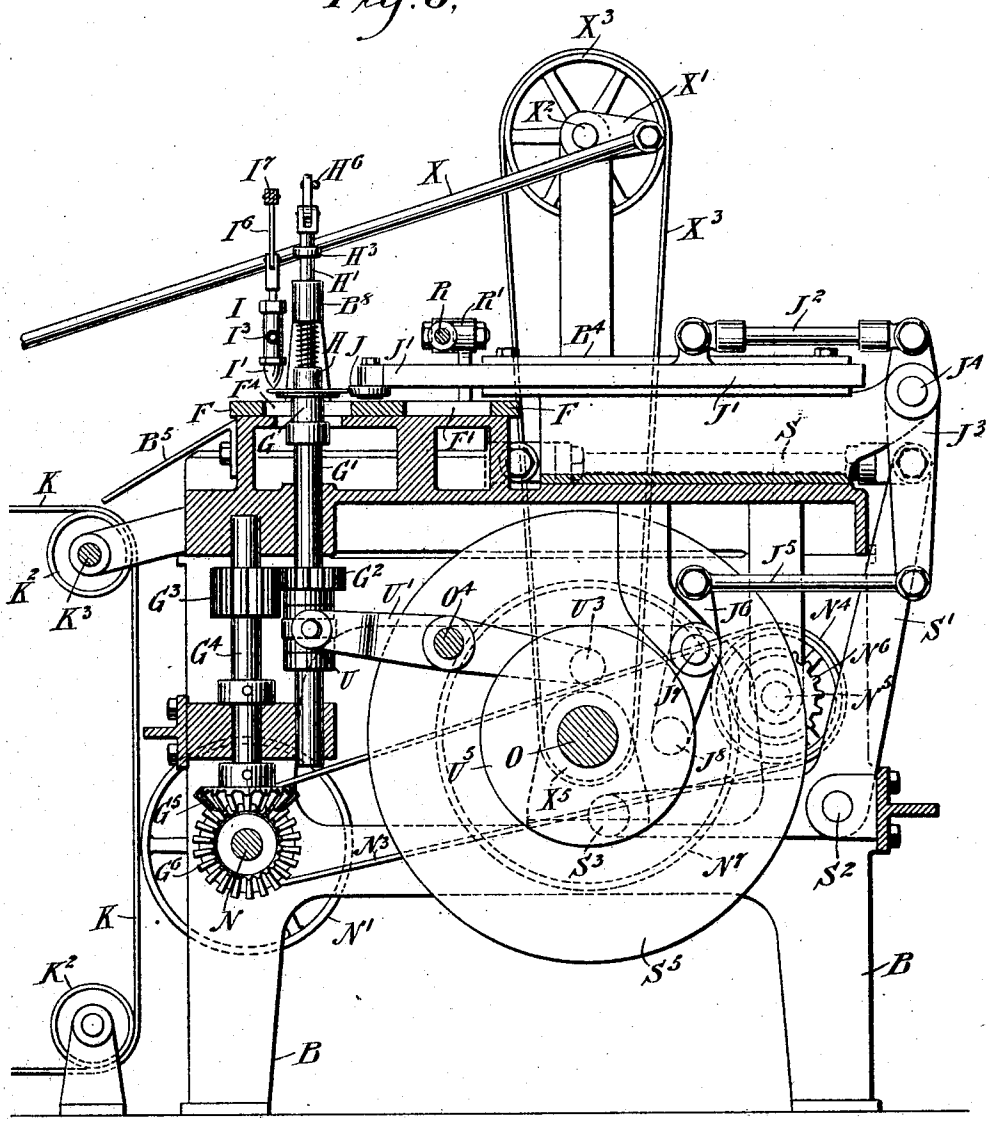
12 SHEETS—SHEET 6.

Fig. 6.



WITNESSES:

Edward Thorpe.

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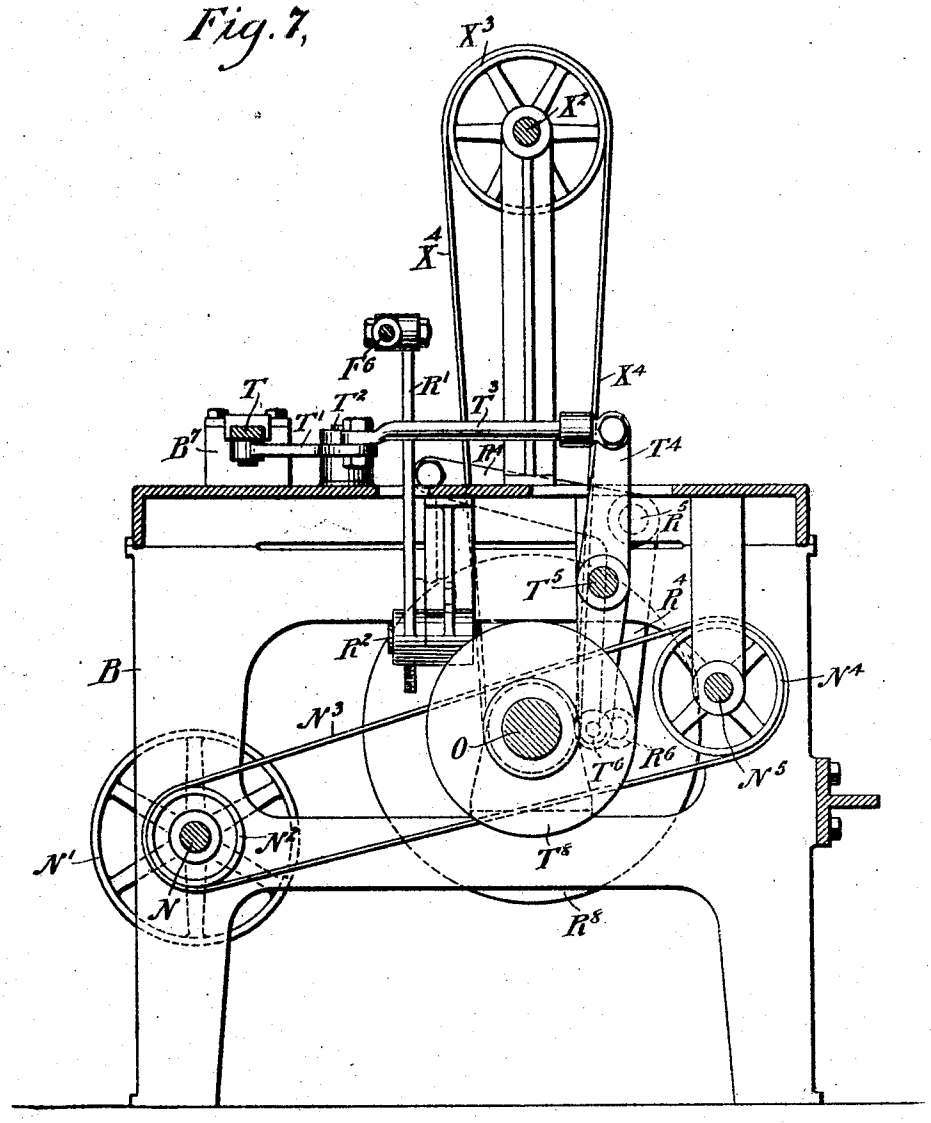
12 SHEETS—SHEET 7.

Fig. 7.



WITNESSES:

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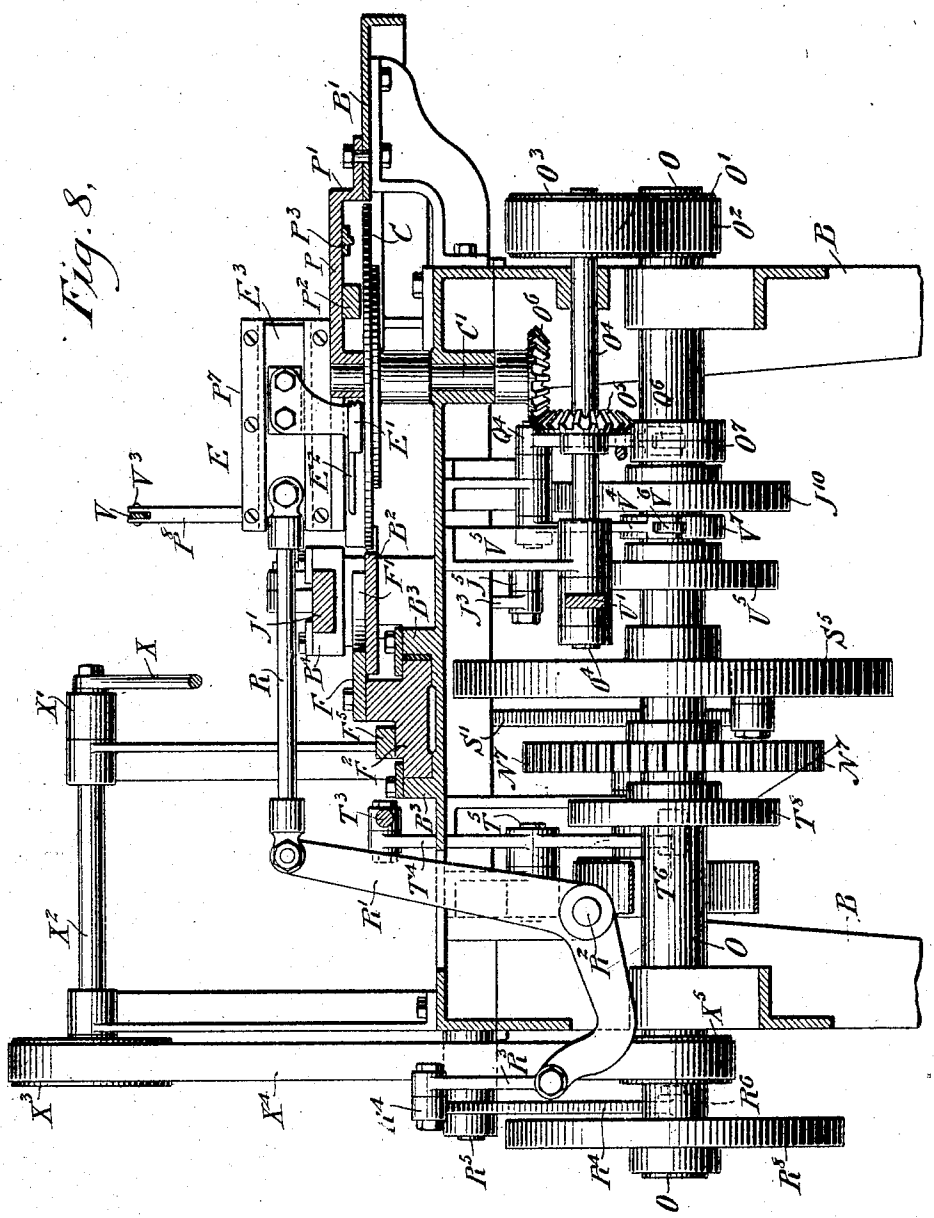
12 SHEETS—SHEET 8.

Fig. 8.



WITNESSES:

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12 SHEETS—SHEET 9.

Fig. 10.

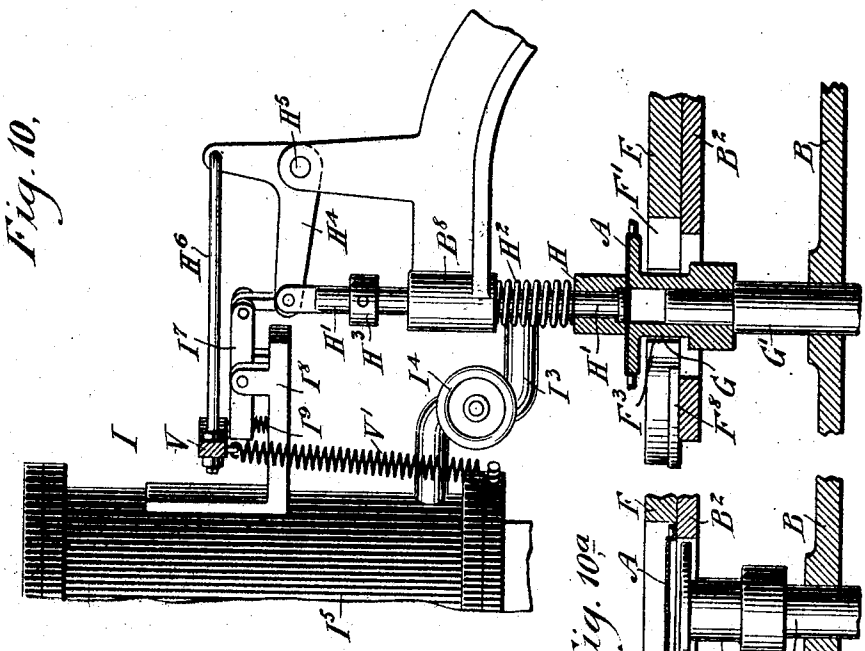
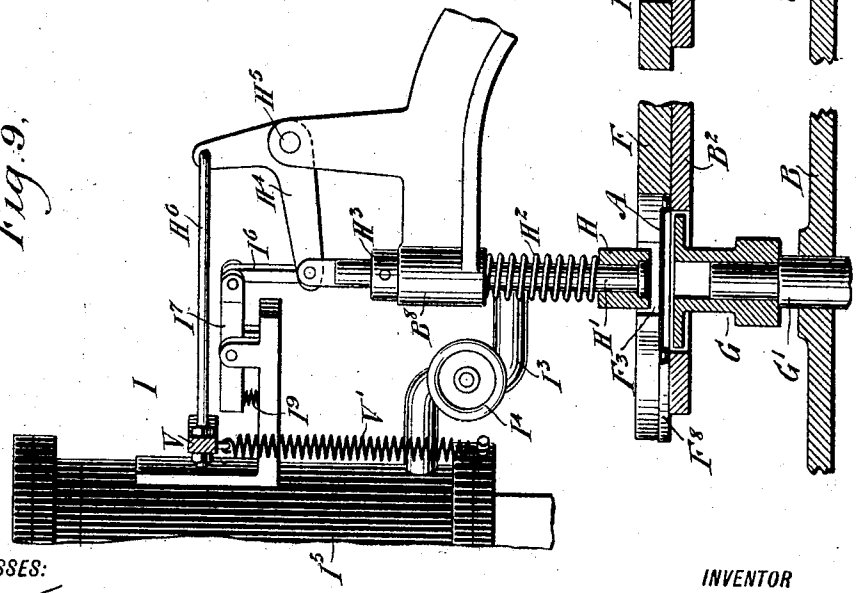


Fig. 10a.

Fig. 9.



WITNESSES:

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12 SHEETS—SHEET 10.

Fig. 11.

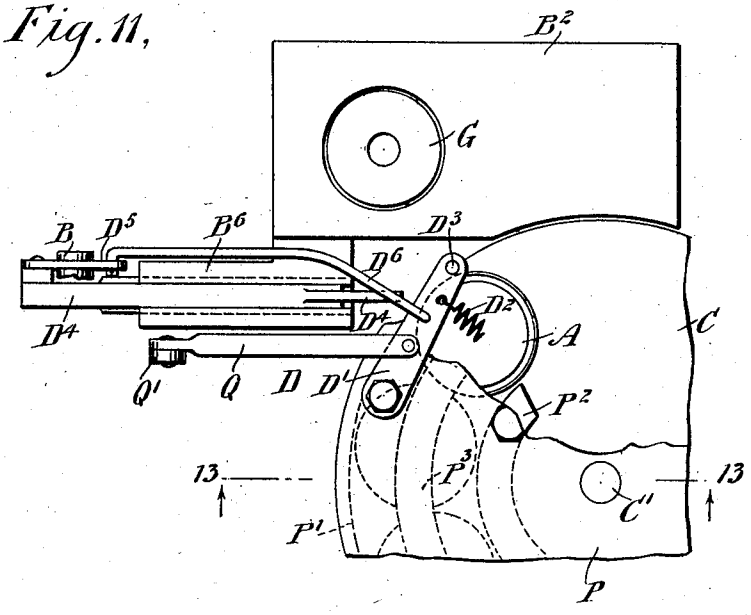
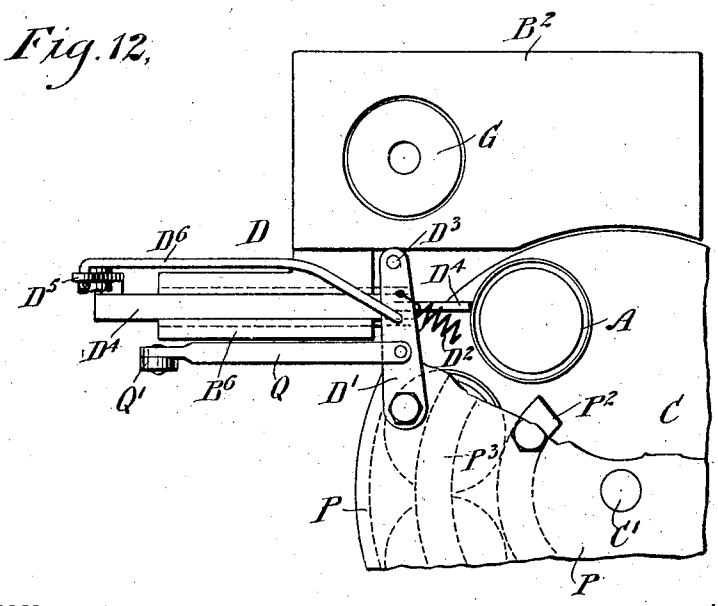


Fig. 12.



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12 SHEETS—SHEET 11.

Fig. 13.

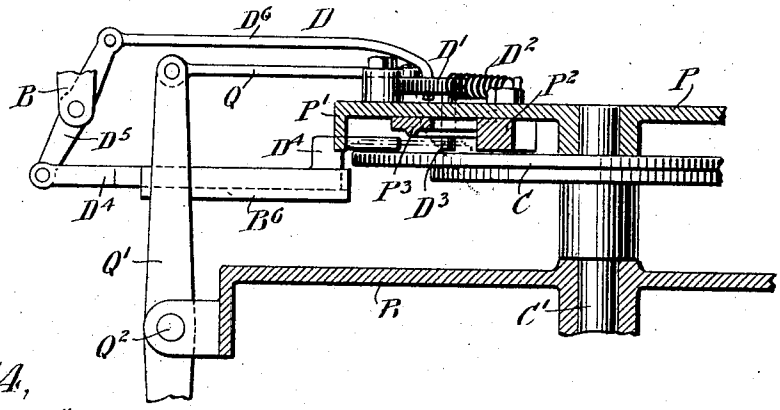


Fig. 14.

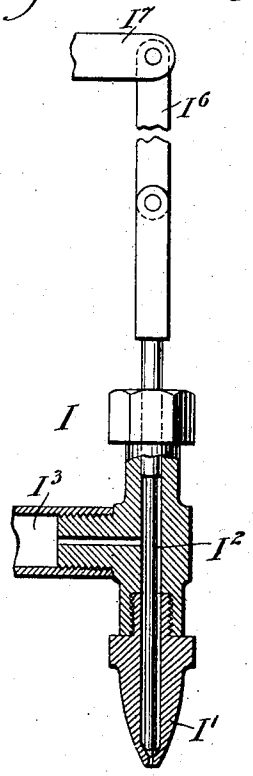


Fig. 15.

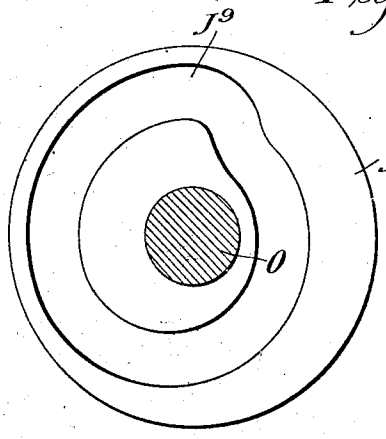
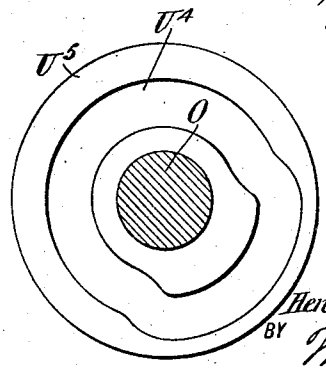


Fig. 16.



WITNESSES:

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12 SHEETS—SHEET 12.

Fig. 17,

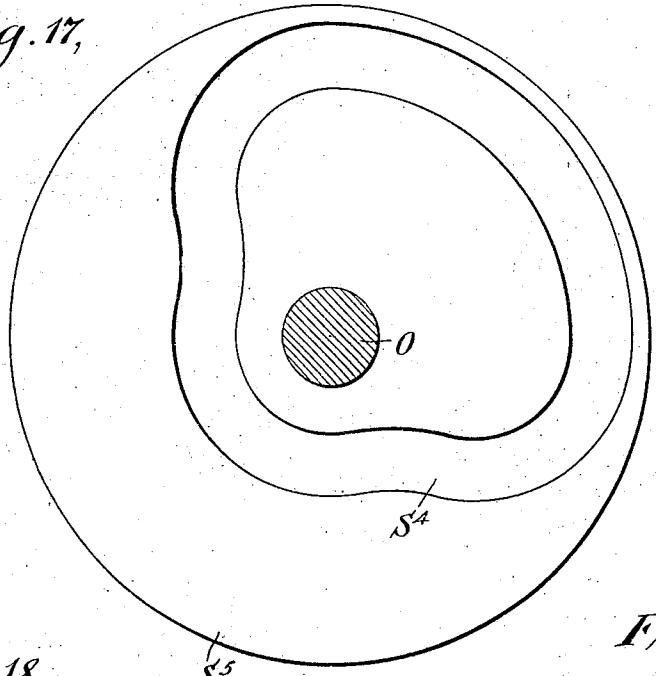


Fig. 18,

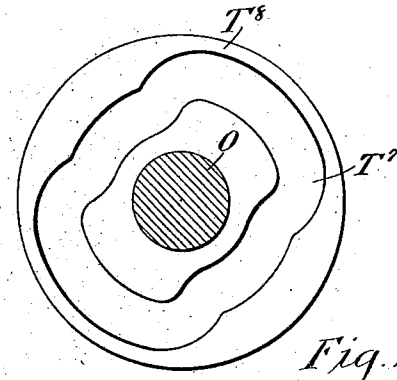


Fig. 19,

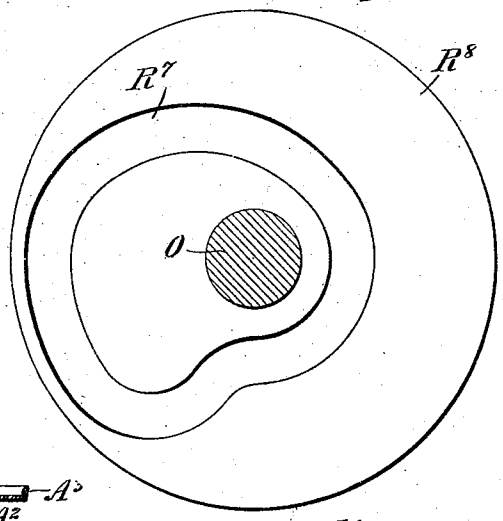


Fig. 20,

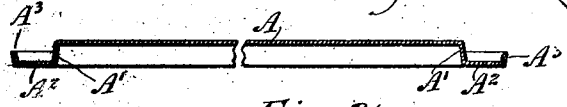


Fig. 21,

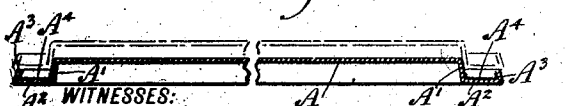


Fig. 22,

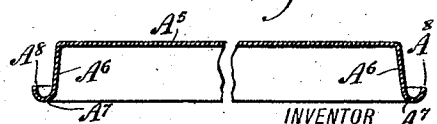
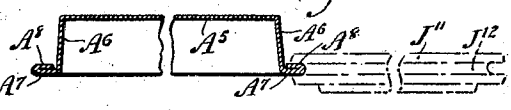


Fig. 23.



WITNESSES:

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Henry J. Hesslar

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Henry L. Guenther

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ATTORNEYS

UNITED STATES PATENT OFFICE.

HENRY LOUIS GUENTHER, OF LOS ANGELES, CALIFORNIA.

CAN-HEAD LINING AND ROLLING MACHINE.

1,046,291. Specification of Letters Patent. Patented Dec. 3, 1912.

Application filed June 16, 1910. Serial No. 567,141.

To all whom it may concern:

Be it known that I, HENRY L. GUENTHER, a citizen of the United States, and a resident of Los Angeles, in the county of Los Angeles and State of California, have invented a new and Improved Can-Head Lining and Rolling Machine, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved can head lining and rolling machine, more especially designed for placing liquid cement or other packing material onto the flanges of can heads, and to bend over the flange edges, to confine and hold the packing material in place and to prevent the can heads from sticking one on the other when stacked for shipping or storing purposes, the said packing material after drying forming a lining or a packing, and when the can head is finally attached to the can body and the flange is crimped and compressed onto the can body, then a can is produced having an air-tight double seam, thus rendering the can exceedingly serviceable for packing various food products therein without danger of leakage.

A further object of the invention is to provide a machine which is completely automatic, requiring but one attendant and capable of treating a large number of can heads in a comparatively short time.

For the purpose mentioned, the machine in its general construction consists of a continuously revolving platform for receiving the can heads and carrying the same to a transferring device which delivers the can heads one after another to an intermittently reciprocating platen, which in turn carries the can head to a rolling device, at which the can head flange is bent up and the required amount of packing material is placed onto the flange and the latter's edge is slightly bent inward, to confine the packing material, the finished can head then being discharged from the machine and passed onto a conveyer, which carries the can heads to a drying apparatus, to insure the proper drying of the packing material.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a plan view of the machine, as arranged for can heads in which a packing material is used, the parts being in position after delivering the packing material to one can head and bending the edge thereof inward, while another can head is in position for transfer from the revolving platform to the reciprocating platen; Fig. 2 is a like view of the same, showing the parts in position at the time the previously completed can head is discharged and another can head receives the packing material and its edge is bent inward; Fig. 3 is an elevation of the machine looking at the same from the right-hand side; Fig. 4 is a front elevation of the same, part of the conveyer for carrying the finished can heads to a drying device being shown in section; Fig. 5 is a sectional front elevation of the machine on the line 5—5 of Fig. 1; Fig. 6 is a similar view of the same on the line 6—6 of Fig. 1; Fig. 7 is a like view of the same on the line 7—7 of Fig. 1; Fig. 8 is a cross section of the same on the line 8—8 of Fig. 1; Fig. 9 is an enlarged transverse section of part of the crimping device and the packing supply, the parts being in position prior to the act of rolling over the edge of the can head flange; Fig. 10 is a similar view of the same with the parts in position while bending the edge of the can head flange inward; Fig. 10^a is a like view of the same with the parts in position after the edge of the flange has been bent inward; Fig. 11 is an enlarged plan view of part of the revolving platform and the can head retaining means in position for holding the foremost can head temporarily in position, part of the plate being broken out; Fig. 12 is a like view of the same showing the parts in position after the foremost can head on the platform is released; Fig. 13 is a sectional front elevation of the same, the section being on the line 13—13 of Fig. 11; Fig. 14 is an enlarged cross section of the packing and feeding device; Fig. 15 is an enlarged face view of the cam for moving the crimping roller into and out of active position; Fig. 16 is an enlarged face view of the cam for raising and lowering the

mandrel; Fig. 17 is an enlarged face view of the cam for reciprocating the platen; Fig. 18 is an enlarged face view of the cam for actuating the bolt used in locking the platen in either of its two positions of rest; Fig. 19 is an enlarged face view of the cam for actuating the transferring device employed for transferring or shifting a can head from the revolving platform into the platen; Fig. 20 is an enlarged sectional side elevation of the can head prior to bending the flange inward; Fig. 21 is a like view of the same after bending the flange edge inward to confine the packing material and prevent the can heads from sticking one on the other when stacked for storing or shipping purposes; Fig. 22 is a similar view of a can head, the flange of which is to be doubled up; and Fig. 23 is a like view of the same after the can head flange is doubled up.

The can head A (see Figs. 20 and 21), to be treated by the machine presently to be described in detail, is provided with a rim A', from which extends outwardly a flange A^2 having a turned up annular edge A^3, to form with the rim A' an annular channel for receiving the fluid cement or other packing material A^4, the edge A^3 being slightly bent inward by the machine, to hold the packing material A^4 in place, and to allow of stacking the can heads without danger of one sticking to the other, as indicated in Fig. 21. The can head A^5, shown in Fig. 22 is provided with a rim A^6 having a flange A^7 having a turned-up edge A^8 adapted to be doubled up, as shown in Fig. 23. The machine shown in the drawings is more especially designed for can heads having a packing therein, as illustrated in Figs. 20 and 21 and will presently be described for this purpose, and the modification of the machine necessary for doubling up the flange edges A^8 will be disclosed subsequently.

The machine is mounted on a suitably constructed main frame B having a table B' for the can heads A placed thereon, with the edges A^3 extending upward, and the said can heads A are fed one by one by an attendant onto a continuously revolving platform C, having its upper edge flush with the table B'. The platform C carries the can heads A successively to a retaining and releasing device D, which engages the foremost can head A and holds the same and consequently the succeeding one temporarily against forward movement, and at the proper time this device D releases the foremost can head to allow the same to be carried by the platform C to a transferring or shifting device E, which moves this can head transversely in a rearward direction and off the platform C onto a rear table B^2 and into a notch F' of a platen F, provided with a slide F^2 (see Fig. 8) intermittently reciprocating in suitable bearings B^3 forming part of the main frame B (see Fig. 8). The platen F moves the can head A over the rear table B^2 from the right to the left (see Fig. 2) and centrally over a mandrel G mounted to turn and to slide up and down and operating in conjunction with a yielding clamping head H, likewise mounted to slide up and down and adapted to engage the top of the can head A (see Figs. 9 and 10), to cause the can head A to revolve with the mandrel G. The mandrel G on rising lifts the can head A above the platen F (see Fig. 10) and at this time the packing material A^4 is delivered to the can head in a predetermined quantity through a nozzle I' of a packing material supply device I, mounted on the main frame B. A bending roller J now engages the edge A^3 of the can head A and bends the said edge slightly over to confine the packing material, as previously mentioned, the said roller J being journaled on the left-hand end of a slide J' mounted to reciprocate in a longitudinal direction in suitable bearings B^4 forming part of the main frame B.

The platen F is provided with a longitudinally-extending slot F^3 which connects the notch F' with an aperture F^4, the slot F^3 being somewhat wider than the hub of the mandrel G, so that while the bending operation is carried on the platen F is returned to its normal position (see Fig. 1), to return the aperture F^4 to a central position relative to the mandrel G, which now lowers the finished can head A back onto the table B^2 and into the said aperture F^4, so that on the next forward movement of the platen F to the left, the finished can head is carried by the platen F off the table B^2 and onto the chute B^5 forming part of the main frame B. The chute B^5 delivers the can head A to an endless belt K (see Figs. 4 and 6) which carries the can heads to a reciprocating obliquely-disposed shifter and spreader L for shifting the can heads off the belt K and onto an endless conveyer belt K', which carries the can heads A to a drying room or to an apparatus for drying the packing material.

The several devices are actuated in harmony from a main driving shaft N, extending transversely and journaled in suitable bearings arranged on the main frame B, and on the rear end of the said main driving shaft N are secured fast and loose pulleys N' connected by a belt with other machinery for imparting a continuous rotary motion to the main driving shaft N. On the main driving shaft N is secured a pulley N^2 (see Fig. 7), over which passes a belt N^3, also passing over a pulley N^4 secured on a counter shaft N^5 extending transversely and journaled in suitable bearings arranged on the main frame B. On the counter shaft N^5

is secured a pinion N^6 (see Figs. 3, 5 and 6) in mesh with a gear wheel N^7 secured on the main cam shaft O, extending transversely and journaled in suitable bearings on the main frame B. On the cam shaft O is secured a pulley O′ (see Figs. 3, 4 and 8) over which passes a belt O^2 also passing over a pulley O^3 secured to a transverse shaft O^4, journaled in suitable bearings on the main frame B. On the shaft O^4 is secured a bevel gear wheel O^5 (see Figs. 5 and 8) in mesh with a bevel gear wheel O^6 attached to the lower end of the shaft C′ of the platform C, so that when the machine is running and the main driving shaft N is rotating, then a rotary motion is transmitted by the devices just described to the shafts N^5, O, O^4 and C′, to rotate the platform C continuously in the direction of the arrow *a′* shown in Figs. 1 and 2.

The rotary motion given to the platform C carries the can heads A placed thereon by the attendant to the retaining and releasing device D, which periodically interrupts the travel of the can heads, and in order to properly guide the can heads A and to prevent the same from sliding one on top of the other by the action of the continuously rotating platform C, use is made of a plate P, secured to the table B′ and extending a distance above the platform C. The plate P is provided with a rim P′ following the left-hand margin of the platform C, so that the can heads A cannot pass outward over the margin of the platform C, and on the under side of the plate P is secured a guiding segment P^2 concentric to the rim P′ and spaced from the same a distance corresponding approximately to the diameters of the can heads A, so that the can heads are carried along by the platform C with the opposite sides of the can heads guided by the rim P′ and the segment P^2. On the under side of the plate P intermediate the rim P′ and the segment P^2 is arranged a segment P^3, adapted to reach close to the upper faces of the can heads A, to prevent one can head from sliding onto the top of another during their travel to the retaining and releasing device D. The segment P^3 is vertically adjustable to suit can heads A of different height, and for this purpose the segment P^3 is provided with upwardly-extending pins P^4 slidingly engaging bearings P^5 formed on the plate P, the pins P^4 being secured to the bearings P^5 by set screws P^6 after the desired adjustment of the segment P^3 is made (see Figs. 4 and 5).

The retaining and releasing device D is arranged as follows, special reference being had to Figs. 1, 2, 4, 5, 11, 12 and 13. On the top of the plate P is fulcrumed an arm D′, acted on by a spring D^2 and provided at its free end with a depending pin D^3, adapted to pass into the path of the foremost can head A, so as to hold the same temporarily in position at the rear end of the rim P′ and the segment P^2 of the plate P, as plainly shown in Fig. 11. The arm D′ is pivotally connected by a link Q with an upright lever Q′ fulcrumed at Q^2 on the main frame B and pivotally connected by a link Q^3 with an upright arm Q^4, fulcrumed at Q^5 on the main frame B (see Fig. 5), and on the lower free end of the arm Q^4 is journaled a friction roller Q^6 in peripheral engagement with a cam Q^7 secured to the main cam shaft O. Thus when the machine is running, the mechanism just described imparts a swinging motion to the lever arm D′, so as to move the pin D^3 out of engagement with the foremost can head A (see Fig. 12), to release the same and thereby allow the platform C to carry the released can head to the transferring or shifting device E. The arm D′ is returned to its normal position shown in Fig. 11, by the action of the spring D^2 at about the time the next following can head is carried rearward by the platform C to a point near the ends of the rim P′ and the segment P^2, so that further travel of this can head is prevented for the time being.

In order to prevent a can head after being released, from sticking, use is made of a slide D^4, adapted to pass with its free end over the platform C in contact with the peripheral face of the can head A, so as to loosen the same in case it should stick and thus allow the platform C to carry a released can head along. The slide D^4 is mounted to slide in bearings B^9 forming part of the main frame B, and the outer end of the slide D^4 is pivotally connected with a lever D^5, fulcrumed on the main frame B and pivotally connected by a link D^6 with the arm D′. Thus when the arm D′ is swung outward from the retaining position shown in Fig. 11 to the releasing position shown in Fig. 12, then the slide D^4 is pushed inward by the mechanism just described, so as to loosen the released can head, and when the arm D′ swings from the releasing position back into the retaining position the slide D^4 is withdrawn in the position shown in Fig. 11.

The transferring device E is arranged as follows, special reference being had to Figs. 1, 2, 3 and 8: Over the rear portion of the platform C is arranged a segmental pusher E′ adapted to engage the front of the peripheral face of a can head A carried by the platform C to the rearmost position (see Fig. 1), and said pusher E′ is provided with a rearwardly-extending finger E^2, adapted to extend over the top of the can head A at the time the pusher E′ is in engagement with the can. The pusher E′ is secured to an overhead slide E^3, mounted to reciprocate transversely in suitable guideways P^7, attached to or forming part of the plate P.

The slide E^3 is pivotally connected by a link R with a bell crank lever R′, fulcrumed on the main frame B and pivotally connected by a link R^3 with a bell crank lever R^4, fulcrumed at R^5 on the rear end of the main frame B. The bell crank lever R^4 is provided with a friction roller R^6 engaging a cam groove R^7 in a cam R^8 attached to the cam shaft O. Now when the machine is running, the mechanism just described imparts an intermittent reciprocating motion to the slide E^3 and consequently to the pusher E′, to move the can head A, engaged by the pusher at the time, in a rearward direction, that is, from the platform C onto the table B^2 and into the notch F′ of the platen F. As soon as this is accomplished, the pusher E′ immediately returns to its normal forward position over the platform C (see Fig. 2). The pusher E′ is provided at its left side with a guard E^4, to prevent a can head from passing to the rearmost position on the platform C during the reciprocation of the pusher E′.

In order to impart an intermittent reciprocating motion to the platen F, the following arrangement is made, special reference being had to Figs. 1, 2, 3, 6, 8, 9, 10 and 10^a. The slide F^2 on which the platen F is fastened is pivotally connected by a link S with a bell crank lever S′ fulcrumed at S^2 on the main frame B, and on the said bell crank lever S′ is mounted an anti-friction roller S^3 engaging a cam groove S^4 in a cam S^5 secured on the cam shaft O. Now when the machine is running, the mechanism just described imparts an intermittent reciprocating motion to the slide F^2 and consequently to the platen F, to move the notch F′ alternately in transverse alinement with the pusher E′ and in axial alinement with the mandrel G and the clamping head H. The reciprocating movement given to the platen F also moves the aperture F^4 alternately in axial alinement with the mandrel G and the clamping head H and over the chute B^5, to discharge the finished can head from the machine, as previously mentioned.

In order to lock the platen F alternately in the positions of rest, the following arrangement is made: On the top of the slide F^2 is secured or formed a bar F^5, provided at its rear edge with notches F^6, F^7, adapted to be engaged by a transversely-extending locking bolt T, mounted to slide in suitable bearings B^7, arranged on the main frame B, as plainly indicated in Fig. 2. The locking bolt T is pivotally connected with a bell crank lever T′ fulcrumed at T^2 on the main frame B, and the said bell crank lever T′ is pivotally connected by a link T^3 with a bell crank lever T^4 fulcrumed at T^5 on the main frame B and carrying an anti-friction roller T^6 engaging a cam groove T^7, formed in one face of a cam T^8 secured on the cam shaft O. Now when the machine is running, the above described mechanism imparts an intermittent sliding movement to the bolt T, to successively engage and disengage the notches F^6, F^7, to lock and unlock the platen F at the proper time. Thus when the platen F is in its right-hand end position the bolt T engages the notch F^7, and when the platen F is in its left-hand end position the bolt T engages the notch F^6.

A turning and an up and down sliding motion is given to the mandrel G by the mechanism presently to be described and shown more fully in Figs. 5 and 6, see also Figs. 9, 10 and 10^a. The mandrel G is mounted on the upper end of a vertically-disposed shaft G′, mounted to turn and slide up and down in bearings arranged on the main frame B, and on the shaft G′ is secured a gear wheel G^2 in mesh with a gear wheel G^3, journaled in suitable bearings on the main frame B. On the lower end of a shaft G^3 is secured a bevel gear wheel G^5 in mesh with a bevel gear wheel G^6 fastened on the main driving shaft N, so that when the machine is running a rotary motion is given to the mandrel G by the mechanism just described. On the shaft G′ of the mandrel G is arranged a shifting collar U, engaged by the forked end of a shifting lever U′, fulcrumed loosely on the shaft O^4 previously mentioned, and on the lever U′ is mounted an anti-friction roller U^3 engaging a cam groove U^4 in a cam U^5 (see Fig. 16), so that when the machine is running an intermittent up and down sliding movement is given to the mandrel G by the mechanism just described. By reference to Fig. 6 it will be seen that the gear wheel G^2 is comparatively narrow, so as to remain at all times in mesh with the wider gear wheel G^3 during the up and down movement of the shaft G′.

The clamping head H serves to hold the can head in position on the rotating mandrel G, so that the latter rotates the can head and the clamping head H automatically controls the amount of packing material A^4 to be delivered by the supply device I. For the purpose mentioned the following arrangement is made, special reference being had to Figs. 1, 2, 9, 10 and 14: The clamping head H is mounted loosely on the lower end of a spindle H′, fitted to slide up and down in a bearing B^8 forming part of the main frame B, and a spring H^2 is interposed between the head H and the bearing B^8, to firmly engage the head H with the top of the can head A at the time the mandrel G moves into its uppermost position, the spring H^2 being compressed, as will be readily understood by reference to Fig. 10. The spindle H′ is provided with a stop collar H^3, adapted to rest on the top of the bearing B^8 to limit the

downward sliding movement of the said spindle H′, as indicated in Fig. 9. Thus when the mandrel G is in its lowermost position, the clamping head H is likewise held in its lowermost position by the action of the spring H², and in this position the clamping head H extends into the notch F′ or the aperture F⁴, the clamping head being of a diameter somewhat less than the slot F⁵ so as not to interfere with the movement of the platen F from the left to the right. When the mandrel G rises and engages and lifts the can head A, the latter finally engages the clamping head H, which is thus moved upward to the position shown in Fig. 10. During this upward movement of the clamping head H and the spindle H′, the packing material A⁴ is allowed to flow onto the flange A² of the can head, and for this purpose the needle valve I² in the nozzle I′ of the supply device I is lifted, so that a desired amount of packing material flows onto the flange A² of the can head A. The nozzle I′ is connected by a pipe I³, having a valve I⁴, with a reservoir I⁵ containing the packing material, it being understood that during the operation of the machine the valve I⁴ is open. The outer end of the needle valve I² is connected by a link I⁶ with a lever I⁷ fulcrumed on a bracket I⁸ attached to the reservoir I⁵, the lever being pressed on by a spring I⁹, so as to normally hold the needle valve I² in a closed position in the nozzle I′, as indicated in Fig. 14. The lever I⁷ is periodically actuated by a lever V, normally standing above one side of the free end of the lever I⁷ (see Fig. 9), and the said lever V is pressed on by a spring V′ and is fulcrumed at V² on a bracket P⁶ attached to the guideway P⁷, the said lever V being connected by a link V³ with a bell crank lever V⁴, fulcrumed at V⁵ on the main frame B, and carrying a friction roller V⁶ engaging the peripheral face of a cam V⁷ secured on the cam shaft O. As previously mentioned, the lever V stands to one side of the lever I⁷, and in order to swing the lever V laterally over the free end of the lever I⁷, connection is made between the spindle H′ and the lever V, as indicated in Figs. 9 and 10. For the purpose mentioned, the upper end of the spindle H′ is pivotally connected with a bell crank lever H⁴, fulcrumed at H⁵ on the bearing B⁸, nd the said bell crank lever H⁴ is connected by a link H⁶ with the lever V, the latter being mounted at its fulcrum V² in such a manner as to allow both up and down as well as a slight lateral movement. Now when the machine is running, and the head H is raised, as previously described, then the spindle H′ actuates the bell crank lever H⁴, which by the link H⁶ swings the lever V over, so as to extend above the free end of the lever I⁷, as shown in Fig. 10. When this takes place the cam V⁷ actuates the connection with the lever V, so as to impart a swinging motion to the latter, whereby the lever V acts on the lever I⁷ and the latter lifts the needle valve I², thus opening the nozzle I′ and allowing a quantity of the packing material to flow from the reservoir I⁵ onto the flange A² of the can head A, in position on the mandrel G at the time. The needle valve I² is held open a sufficient length of time to pass the desired quantity of packing material onto the flange A², and when this has been done the cam V⁷ and its connection with the lever V returns the latter to normal position, so that the lever I⁷ returns to normal position by the action of its spring I⁹, and the needle valve I² is consequently closed. When the clamping head H and its spindle H′ return to their lowermost position, the lever V is shifted laterally back to its previous position, that is, to one side of the free end of the lever I⁷, and consequently the lever V cannot actuate the lever I⁷ for lifting the needle valve I² unless the clamping head H is raised as previously explained, so that the packing material cannot be discharged from the nozzle I′ unless a can head A is in position on the mandrel G and the latter lifts the said can head.

In order to move the roller J into and out of engagement with the edge A³, to bend the same slightly over as before explained, use is made of the following device, special reference being had to Figs. 1, 2, 3, 4 and 6. The slide J′ carrying the roller J is pivotally connected by a link J² with a lever J³, fulcrumed at J⁴ on the main frame B, and the said lever J³ is pivotally connected by a link J⁵ with a lever J⁶, fulcrumed at J⁷ on the main frame B and carrying an anti-friction roller J⁸ engaging a cam groove J⁹ formed in a cam J¹⁰ (see Fig. 15) secured on the cam shaft O. Now when the machine is running, the above described mechanism imparts an intermittent reciprocating motion to the slide J′, which latter moves the roller J in and out of engagement with the edge A³, to bend the latter slightly inward, as before explained.

In order to keep the packing material contained in the reservoir I at all times in proper condition, it is desirable to stir or agitate the said material within the reservoir I⁵. For the purpose mentioned, use is made of a stirring shaft W (see Fig. 5), extending within the reservoir I⁵ and having stirring arms W′ alternating with fixed stirring arms W², arranged within the reservoir I⁵ and attached to the wall thereof. The outer upper end of the shaft W is provided with a pulley W³, over which passes a belt W⁴ also passing over guide pulleys W⁵ and around a pulley W⁶ secured on the main driving shaft N. Thus when the machine is running, the stirring arms W′ stir up the

material in the reservoir I^5, so as to keep the same in proper condition, it being understood that for cement or a similar packing material it may be necessary to connect the reservoir I^5 with a compressed air reservoir, to insure a proper flow of the liquid through the pipe I^3 and the nozzle I' whenever the needle valve I^2 is lifted. The carrier belt K passes over a number of pulleys K^2, of which one is the driving pulley, and is secured on a shaft K^3 journaled on the left-hand side of the main frame B, as indicated in Fig. 4. On the shaft K^3 is secured a pulley K^4, over which passes a belt K^5, also passing over a pulley K^6 secured on the main driving shaft N, and hence when the shaft N is running, a continuous traveling motion will be given to the belt K in the direction of the arrow c', to carry the finished can heads from the chute B^5 to the shifter and spreader L, which pushes the finished can heads onto the conveyer belt K' extending at right angles to the belt K. The shifter L extends obliquely to the belt K and is caused to reciprocate, so as to move the finished can heads successively onto different places on the conveyer belt K', to prevent the can heads from being passed one on top of the other. For the purpose mentioned, the shifter L is attached to a slide L', mounted to slide in suitable guideways L^2, held on a frame L^3, for supporting the carrying mechanism for the conveyer belt K'. The slide L' is pivotally connected by a pitman X with a crank X' secured on a shaft X^2, journaled in suitable bearings carried by the main frame B, and on the shaft X^2 is secured a pulley X^3, over which passes a belt X^4, also passing over a pulley X^5 secured on the cam shaft O. Thus when the machine is running, the shaft X^2 is turned from the cam shaft O and a reciprocating movement is given to the slide L' and its shifter L by the mechanism above described.

The operation is as follows: The attendant standing in front of the machine moves the can heads A one after the other from the table B' toward the platform C, which carries the can heads one behind the other through the guideway formed by the rim P' and the segment P^2, the foremost can head finally reaching the retaining and releasing device D, at which point the pin P' temporarily retains the foremost can head at the terminal of the said guideway. The retaining and releasing device D at the proper time releases the foremost can head, and at the same time this can head receives a bodily movement by the action of the slide D^4, to prevent sticking of the released can head, the latter being now carried further rearward by the revolving platform C, to finally reach the rear of the pusher E', which then moves transversely toward the rear of the machine, thus transferring the can head from the platform C onto the rear table B^2 and into the notch F' then in transverse alinement with the pusher E'. The can head while being pushed into the notch F' passes the free end of a spring arm F^8 attached to the platen F and extending with its free end into the entrance end of the notch F' at one side thereof, the spring arm F^8 preventing the can head from accidentally passing out of the notch F' while the platen F is subsequently moved over the table B^2 to the left. The pusher E' now returns to its normal position over the platform C, it being understood that during the return movement of the pusher E' the guard E^4 of the pusher E' prevents the next foremost can head from passing to the rearmost position. The platen F carries the can head held in the notch F' to the left and centrally over the mandrel G, which is at this time in its lowermost position, as shown in Fig. 9. The mandrel G now rises and lifts the can head off the said table B^2, and engages the top of the can head with the clamping head H, which in rising pulls the lever V into active position relatively to the lever I^7, and at the same time the lever V is actuated by the cam V^7, so that the lever I^7 is actuated to lift the needle valve I^2 and thus open the nozzle I' for the packing material to flow onto the flange A^2 of the can head A revolving with the mandrel G. The packing material is thus evenly distributed on the annular flange A^2, and when this has been accomplished the cam V^7 and the connections with the lever V causes the latter to return, to allow the spring I^9 to close the needle valve I^2. At the same time, while the packing material is distributed on the annular flange A^2, the roller J is advanced and slightly bends the edge A^3 of the can head inward, to hold the packing material on the flange A^2. The roller J is preferably provided with a plain peripheral face (see Fig. 6), so that when the roller J is moved into engagement with the peripheral edge A^3 of the rapidly revolving can head, then the said edge A^3 is bent inward. During this bending operation the platen F returns to the right-hand side position, so that the aperture F^4 is moved into axial alinement with the mandrel G (see Fig. 1), while the notch F' is returned to position, to receive another can head from the platform C by the action of the pusher E'. After the edge A^3 is bent inward by the roller J, the latter recedes and the mandrel G moves downward to return the now finished can head to the table B^2 (see Fig. 10^a), and into the aperture F^4, and on the next movement to the left of the platen F the finished can head is carried along by the said platen and delivered to the chute B^5, which carries the completed can head to the belt K, from which the completed can head is pushed by

the shifter L onto the endless carrier K', which latter is preferably heated by steam coils or other means for drying the packing material. It is understood that when the platen F moves to the left, to deliver the previously-completed can head, another can head is carried by the platen to the mandrel, to receive the packing material and to have its edge bent inward the same as above described in relation to the previously completed can head.

From the foregoing it will be seen that by the machine described, a large number of can heads can be treated in a comparatively short time, each can head having the edge of its flange bent inward to retain the packing material, so as to produce an air-tight double seam when attaching the can head to the can body, thus rendering the can exceedingly serviceable for packing various food products therein without danger of leakage. In order to double up the edge A^8 of the friction can head A^5 shown in Fig. 22, use is made of a roller J^{11}, instead of the roller J, provided with an annular groove J^{12} adapted to engage the edge A^8 and to completely turn the edge over onto the flange A^7 on advancing the said roller J^{11} the same as the roller J. In treating can heads A^5, the device I for supplying the packing material is entirely dispensed with, but otherwise the machine is the same as above described.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A machine for bending the edges of can heads, comprising the following instrumentalities, in combination, a revolving platform for receiving can heads, a retaining and delivering device for temporarily retaining the foremost can head on the said platform and then releasing the same, a transferring device for removing the released can head from the said platform, a platen for receiving the can head from the said transferring device, a mandrel for removing the said can head from the platen and returning it to the same, and for turning the said can head, and a bending device for bending the edge of the can head while the latter is removed by the said mandrel from the platen, the said platen discharging the completed can head from the machine after it is returned to the said platen.

2. A machine for bending the edges of can heads, comprising the following instrumentalities, in combination, a revolving platform for receiving can heads, a retaining and delivering device for temporarily retaining the foremost can head on the said platform and then releasing the same, a transferring device for removing the released can head from the said platform, a platen for receiving the can head from the said transferring device, a mandrel for removing the said can head from the platen and returning it to the same and for turning the said can head, a bending device for bending the edge of the can head while the latter is removed by the said mandrel from the platen, the said platen discharging the completed can head from the machine after it is returned to the said platen, and means for delivering a packing material to the can head while on the said mandrel and previous to bending the edge thereof.

3. A machine for bending the edges of can heads, comprising the following instrumentalities, in combination, a revolving platform for receiving can heads, a retaining and delivering device for temporarily retaining the foremost can head on the said platform and then releasing the same, a transferring device for removing the released can head from the said platform, a platen for receiving the can head from the said transferring device, a mandrel for removing the said can head from the platen and returning it to the same and for turning the said can head, a bending device for bending the edge of the can head while the latter is removed by the said mandrel from the platen, the said platen discharging the completed can head from the machine after it is returned to the said platen, means for delivering a packing material to the can head while on the said mandrel and previous to bending the edge thereof, and conveying means for receiving the completed can head after it is discharged by the said platen, the said conveying means serving to deliver the completed can head to a drying means for drying the packing material.

4. A machine for bending the edges of can heads, comprising the following instrumentalities, in combination, a revolving platform for receiving the can heads, a retaining and delivering device for temporarily retaining the foremost can head on the said platform and then releasing the same, a transferring device for removing the released can head from the said platform, a platen for receiving the can head from the said transferring device, a mandrel for removing the said can head from the platen and returning it to the same and for turning the said can head, a bending device for bending the edge of the can head while the latter is removed by the said mandrel from the platen, the said platen discharging the completed can head from the machine after it is returned to the said platen, a main driving shaft, and connections between the said driving shaft and the said instrumentalities for actuating the latter in the proper sequence.

5. A machine for bending the edges of can heads, provided with a revolving platform for receiving the can heads, a guide

plate extending above the said platform and having a segmental guideway for guiding the can heads one behind the other while carried along by the said platform, and an adjustable segment extending from the said plate into the said guideway close to the upper faces of the can heads to prevent the latter from passing one on top of the other.

6. A machine for bending the edges of can heads, provided with a revoluble platform, and a retaining and releasing device acting in conjunction with the said platform for temporarily retaining the foremost can head on the said platform, the said device having means for bodily moving the can head after the same is released.

7. A machine for bending the edges of can heads, provided with a revolving platform for receiving the can heads, a guide plate extending above the said platform and having a segmental guideway for guiding the can heads one behind the other while carried along by the said platform, and a retaining and releasing device acting in conjunction with the said platform and guideway for temporarily retaining the foremost can head on the platform at the end of the said guideway, the said retaining and releasing device having means for bodily moving the can head after the same is released.

8. A machine for bending the edges of can heads, provided with a retaining and releasing device having an arm provided with a retaining pin for engagement with the can head, a slide for engagement with the can head, means for imparting a swinging motion to the said arm, and means connecting the said arm and slide to move the same in opposite directions.

9. A machine for bending the edges of can heads, provided with a reciprocating platen having a recess and an aperture connected with the recess by a slot, means for feeding a can head into the recess of the platen, a revoluble and vertically sliding mandrel, means for operating the platen to carry the can head in the recess thereof over the mandrel, means for elevating the mandrel, a clamping head for engaging the can head on the mandrel, and means for engaging the edge of the can head to bend the same.

10. A machine for bending the edges of can heads, provided with an intermittently reciprocating platen having a recess, an aperture connected with the recess by a slot, a table over which passes the said platen, means for moving a can head onto the said table and into the said platen recess, a mandrel mounted to turn and to slide and adapted to register with the said platen recess and aperture, the hub of the mandrel being adapted to pass through the said platen slot and the mandrel being adapted to lift the can head off the table and out of the platen notch, to return the can head to the table and into the platen aperture, a clamping head for engaging the can head on the mandrel to rotate the can head with the mandrel, and a roller for engagement with the edge of the can head to bend the same.

11. A machine for bending the edges of can heads, provided with an intermittently reciprocating platen having a recess, an aperture connected with the recess by a slot, a table over which passes the said platen, means for moving a can head onto the said table and into the said platen recess, a mandrel mounted to turn and to slide and adapted to register with the said platen recess and aperture, the hub of the mandrel being adapted to pass through the said platen slot and the mandrel being adapted to lift the can head off the table and out of the platen notch, to return the can head to the table and into the platen aperture, a clamping head for engaging the can head on the mandrel to rotate the can head with the mandrel, a roller for engagement with the edge of the can head to bend the same, and means for delivering a packing material to the said can head prior to bending the edge thereof by the said roller.

12. A machine for bending the edges of can heads, provided with an intermittently reciprocating platen having a recess, an aperture connected with the recess by a slot, a table over which passes the said platen, means for moving a can head onto the said table and into the said platen recess, a mandrel mounted to turn and to slide and adapted to register with the said platen recess and aperture, the hub of the mandrel being adapted to pass through the said platen slot, and the mandrel being adapted to lift the can head off the table and out of the platen notch to return the can head to the table and into the platen aperture, a clamping head for engaging the can head on the mandrel to rotate the can head with the mandrel, and a reciprocating slide carrying a roller for engagement with the edge of the can head to bend the edge.

13. A machine for bending the edges of can heads, provided with a table, an intermittently reciprocating platen for carrying a can head over the said table, a revoluble platform for carrying the can heads, means for feeding the can heads from the platform to the platen, a mandrel mounted to turn and to slide up and down and adapted to lift a can head off the table and platen, a yieldingly mounted clamping head for engagement with the can head on the mandrel for rotating the can head with the mandrel, and a reciprocating slide carrying a roller for engagement with the edge of the can head to bend the said edge.

14. A machine for bending the edges of can heads, provided with a mandrel mounted to

turn and fitting into the can head, a clamping head adapted to engage the top of the can head to press the latter in contact with the mandrel and thus cause the can head to revolve with the mandrel, the said clamping head being raised and lowered with the said mandrel, a roller for engaging the edge of the can head laterally to bend the edge, a nozzle connected with a packing material supply and extending over the flange of the can head, a valve in the said nozzle, and means for periodically opening the said valve and controlled by the said clamping head.

15. A machine for bending the edges of can heads, provided with an intermittently reciprocating platen having a recess, an aperture connected with the recess by a slot, and a spring finger on the platen at one side of the entrance to the notch to hold a can head in the notch.

16. A machine for bending the edges of can heads, comprising the following instrumentalities, in combination, a revoluble platform for receiving can heads, a retaining and delivering device for temporarily retaining the foremost can head on the said platform and then releasing the same, a transferring device for removing the released can head from the said platform, a platen for receiving the can head from the said temporary device, a mandrel for removing the said can head from the platen and returning it to the same and for turning the said can head, a bending device for bending the edge of the can head while the latter is removed by the said mandrel from the platen, the said platen discharging the completed can head from the machine after it is returned to the said platen, and an automatic locking and unlocking device for the said platen to lock the same in its two extreme positions of rest.

17. A machine of the class described, provided with conveyer belts, one crossing the outer, a shifter standing obliquely over the uppermost conveyer belt to engage the can heads thereon and direct the same onto the lower belt, and means for imparting a reciprocating motion to the said shifter.

18. In a machine of the class described, the combination with a revoluble platform, of a pivoted and spring pressed arm provided with a projection on one face for engaging the foremost can head to temporarily hold it, means for imparting a swinging motion to said arm to release the can head, a movable member for engaging the can head to loosen the same and prevent it from sticking, and a connection between the arm and member, whereby the member will be moved into engagement with the can head when released by the arm and out of engagement therewith when held by said arm.

19. In a machine of the class described, the combination with a revoluble platform, of a pivoted and spring pressed arm having means at its free end for engaging the foremost can head to temporarily hold it on the platform, means for imparting a swinging movement to said arm, a slide for engagement with the can head to loosen the can head to prevent it from sticking when released by the said arm, a lever, means for operating the lever, and a link connecting the lever with the said arm.

20. In a machine of the class described, the combination with a revoluble platform, of a retaining device for engaging the foremost can head to temporarily hold the said head on the platform, means for loosening the can head to prevent it from sticking, and means whereby the retaining device and the means for moving the can head will be alternately moved into and out of engagement with the can head,

21. In a machine of the class described, the combination with a revoluble platform, of a reciprocating member above the platform for discharging the can heads from the platform, said member having a finger adapted to project over the can head when the member is in engagement with said head.

22. In a machine of the class described, the combination with a revoluble platform, of a slide, a segmental pusher carried by the slide and having a finger adapted to project over the can head, and means for operating said slide.

23. In a machine of the class described, the combination of members for clamping a can head, a container for a packing material having a discharge nozzle, a valve in said nozzle, a lever pivoted to swing vertically and horizontally, a connection between the lever and one of the clamping members to impart a horizontal swinging movement to said lever, and means connected with the valve and operated by said lever when swung horizontally and vertically to open said valve.

24. In a machine of the class described, the combination of members for clamping a can head, a container for a packing material, having a discharge nozzle, a valve in said nozzle, a pivoted and spring pressed lever, a connection between the lever and valve, a lever pivoted to swing vertically and horizontally, and a connection between the said lever and one of the clamping members for swinging the said lever horizontally over the first named lever.

25. In a machine of the class described, the combination of a vertically slidable clamping member for a can head, a container for a packing material, having a discharge nozzle, a valve in said nozzle, a pivoted and spring pressed lever, a link connecting the lever with the stem of said valve, a spring pressed lever pivoted to swing ver-

tically and horizontally, an elbow lever having one member pivotally connected with the clamping head, and a link pivoted to the other member of the elbow lever and to the vertically and horizontally swinging lever.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY LOUIS GUENTHER.

Witnesses:
JENNIE E. MOHL,
E. A. MILLER.