No. 698,520. Patented Apr. 29, 1902.

F. H. KNAPP & C. W. BLACKSTONE.

CAN LABELING AND WRAPPING MACHINE.

(Application filed May 12, 1900. Renewed Mar. 19, 1902.)

(No Model.) 5 Sheets—Sheet 1.

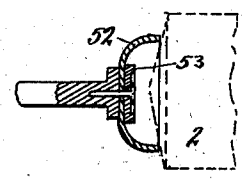


Fig. 14.

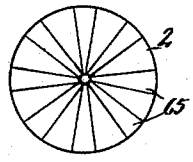


Fig. 15.

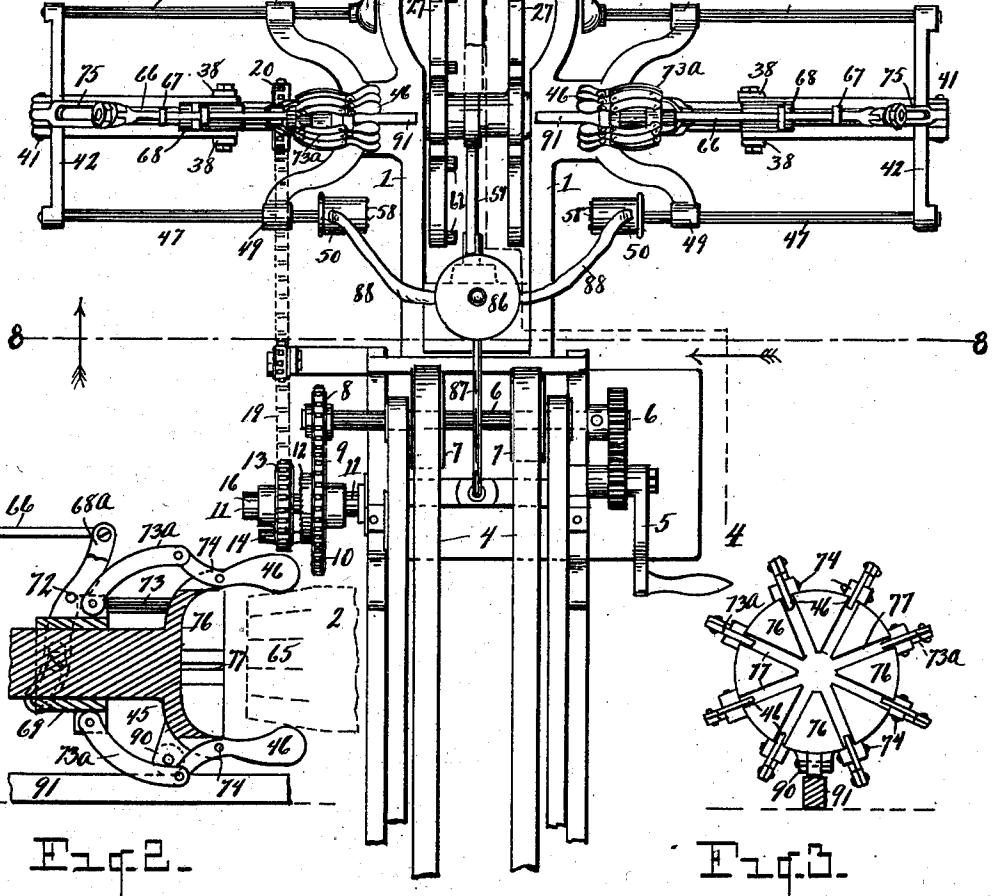


Fig. 1.

Fig. 2.

Fig. 3.

WITNESSES.

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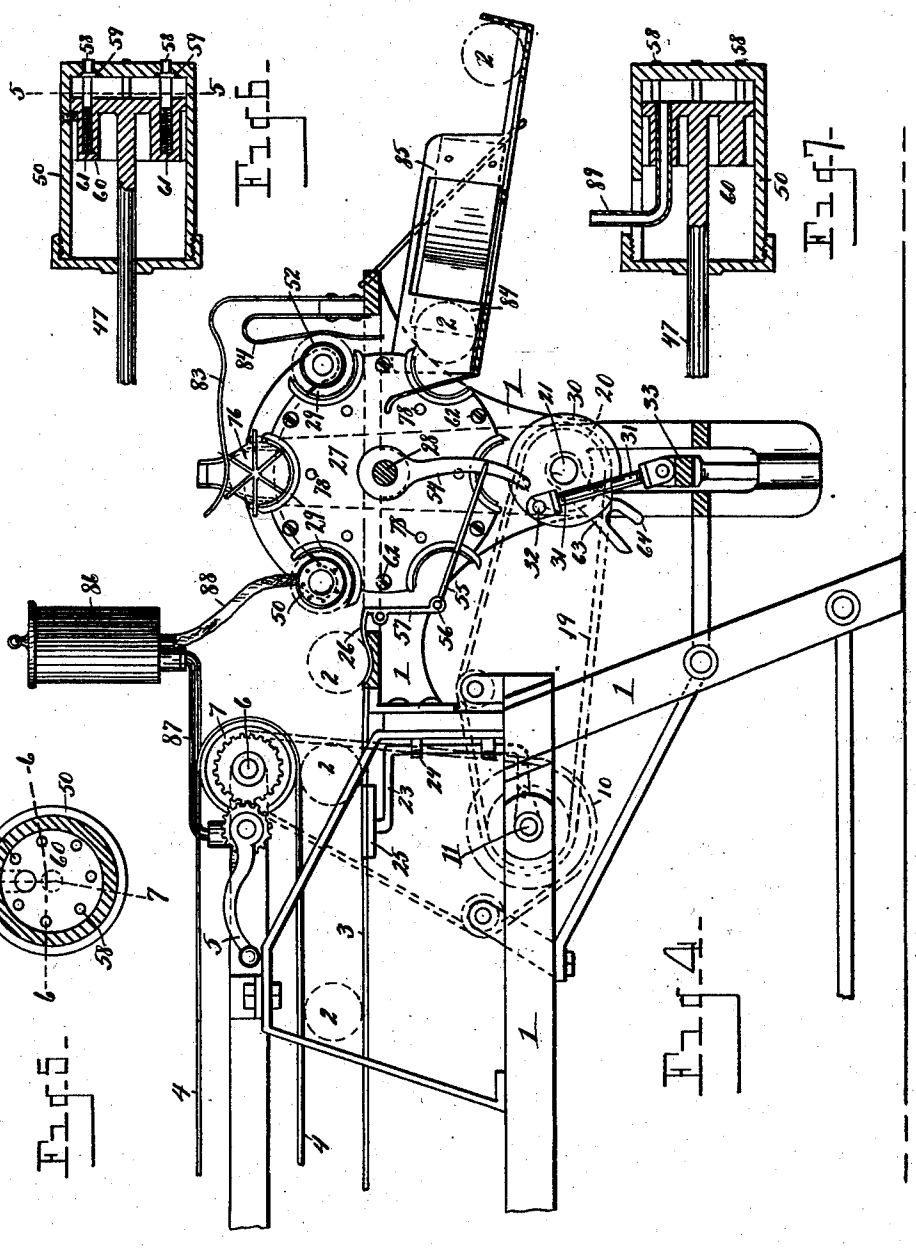
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(No Model.) 5 Sheets—Sheet 2.



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(Application filed May 12, 1900. Renewed Mar. 19, 1902.)

(No Model.) 5 Sheets—Sheet 3.

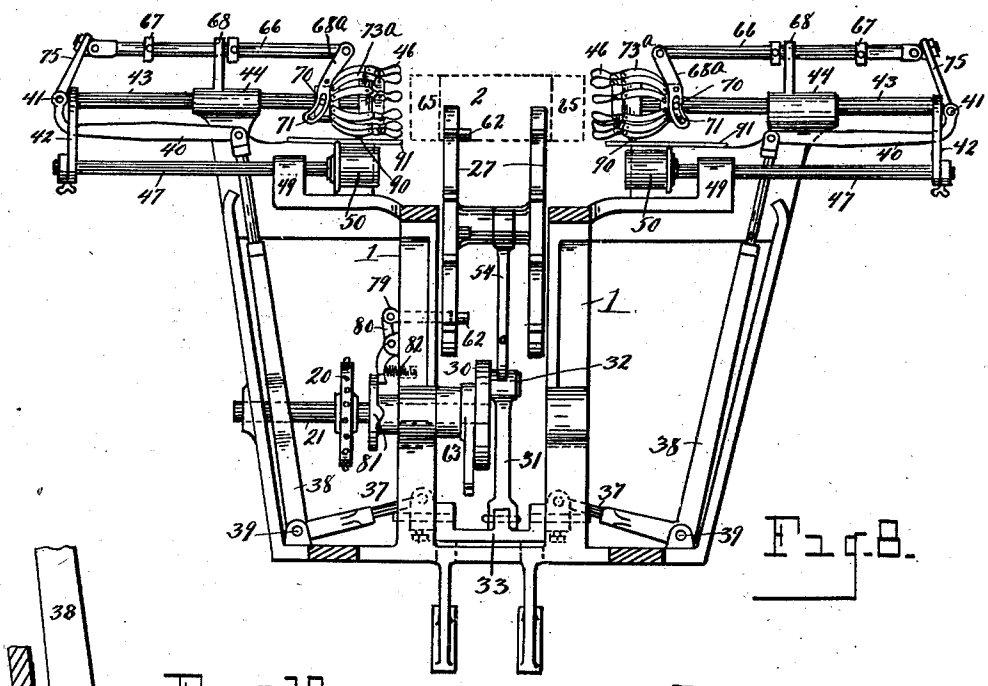


Fig. 8.

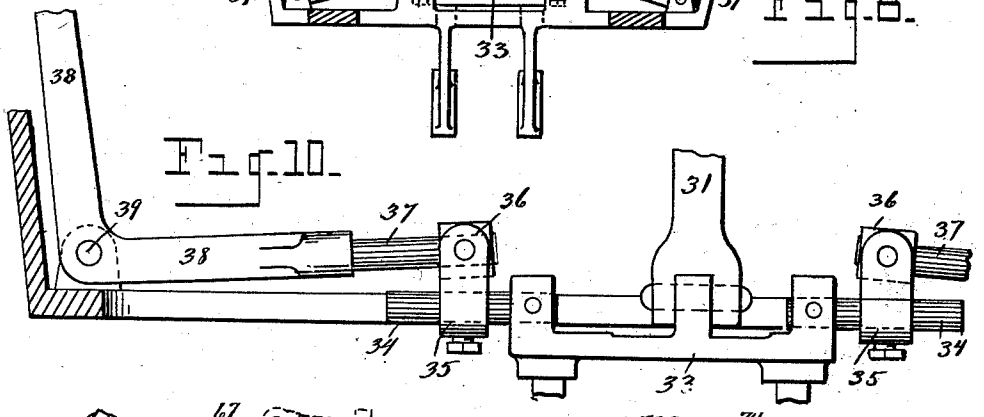


Fig. 10.

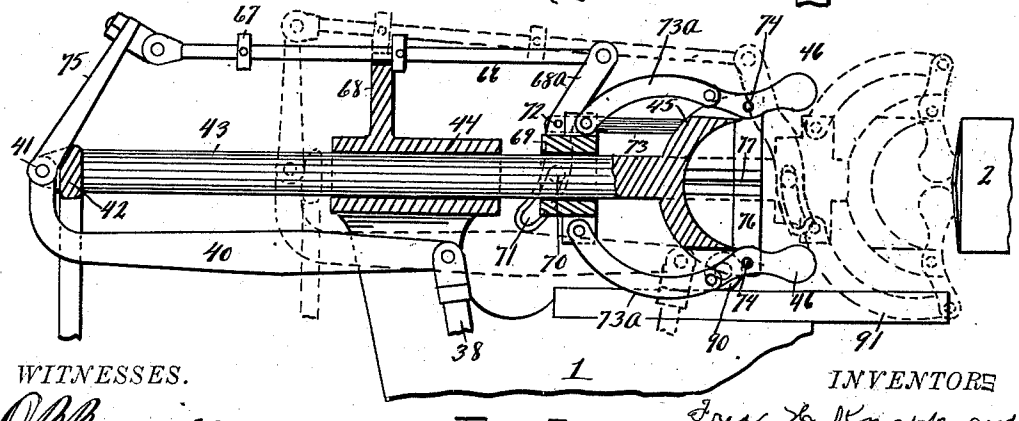


Fig. 9.

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CAN LABELING AND WRAPPING MACHINE.

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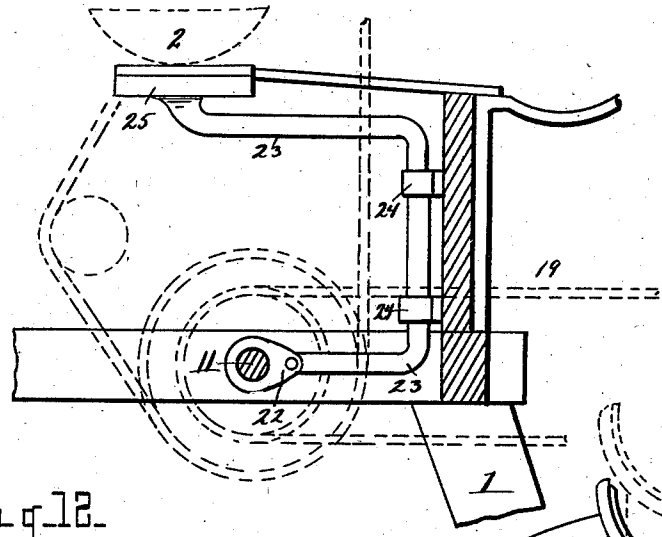


Fig. 12.

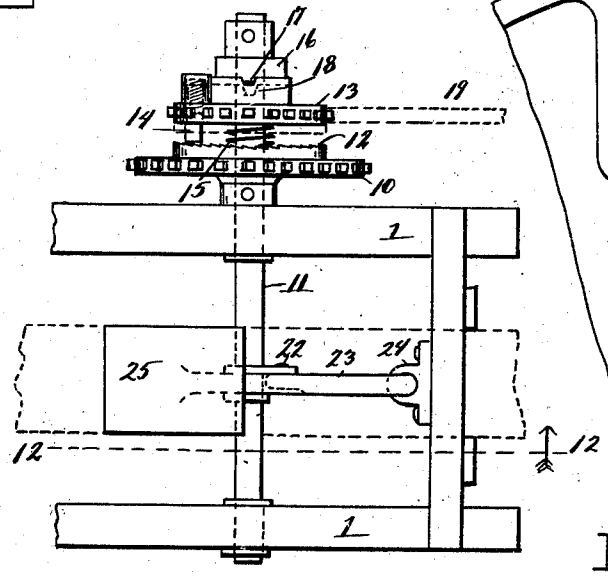


Fig. 11.

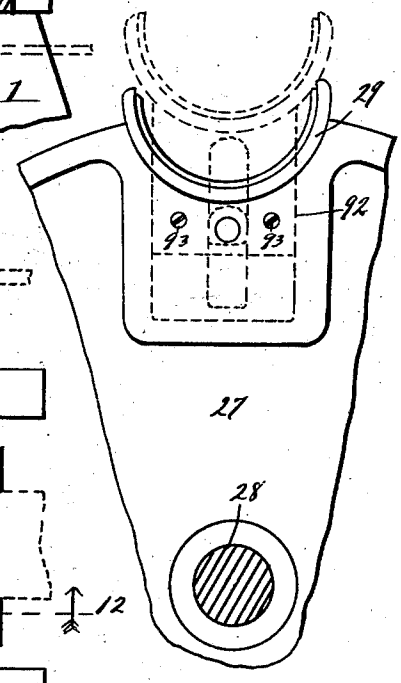


Fig. 13.

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CAN LABELING AND WRAPPING MACHINE.

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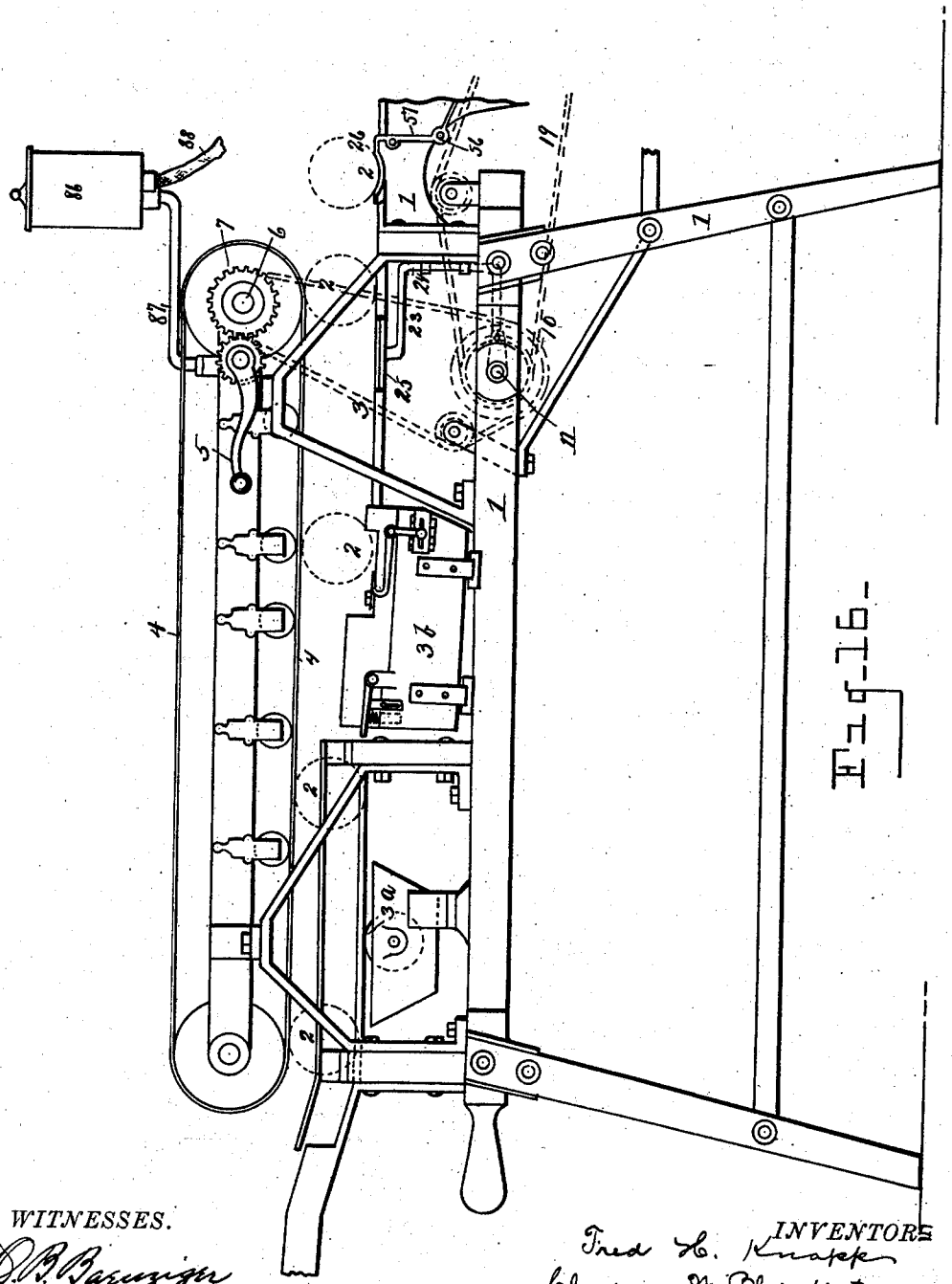


Fig. 16.

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UNITED STATES PATENT OFFICE.

FRED H. KNAPP AND CLARENCE W. BLACKSTONE, OF CHICAGO, ILLINOIS.

CAN LABELING AND WRAPPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 698,520, dated April 29, 1902.

Application filed May 12, 1900. Renewed March 19, 1902. Serial No. 98,916. (No model.)

To all whom it may concern:

Be it known that we, FRED H. KNAPP and CLARENCE W. BLACKSTONE, citizens of the United States, residing at Chicago, in the county of Cook, State of Illinois, have invented certain new and useful Improvements in Can Labeling and Wrapping Machines; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to can labeling and wrapping machines; and it consists in the construction and arrangement of parts hereinafter fully set forth, and pointed out particularly in the claims.

The objects of the invention are to provide for folding or wrapping the projecting ends of the labels, so that the label ends may be made to cover the ends of the can and present the appearance of a neatly-wrapped package, for applying glue or other adhesive to the ends of the can, so as to cause the wrapped or folded ends of the label to adhere thereto, for feeding the cans consecutively through the wrapping or folding device and automatically operating said device by each can as it passes from the label-applying portion of the machine, and for discharging the cans from the machine after the labels have been applied and their ends folded and secured in place.

The above objects are attained by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of our labeling and wrapping machine, a portion of the labeling apparatus being broken away, as the particular manner of applying the labels to the cans is immaterial and forms no part of this invention. Fig. 2 is an enlarged view, in vertical section, through the head and sliding collar carrying the folding-fingers and their operative mechanism. Fig. 3 is a front elevation of the whole head shown in section in Fig. 1. Fig. 4 is a longitudinal section as on line 4 4 of Fig. 1. Fig. 5 is a transverse section through one of the glue or adhesive depositing cylinders as on line 5 5 of Fig. 6. Fig. 6 is a longitudinal section through said cylinder-piston and spring-actuated valves as on line 6 6 of Fig. 5. Fig. 7 is a like section as on line 7 7 of Fig. 5. Fig. 8 is a transverse section as on line 8 8 of Fig. 1. Fig. 9 is a detail view, partly in section, of the mechanism for actuating the fingers which accomplish the wrapping or folding of the end of the label. Fig. 10 is an enlarged detail view of the cross-head and its connected parts, through the medium of which the folding mechanism is operated. Fig. 11 is a plan view showing the clutch mechanism adapted to be operated by the passage of the can to start the wrapping mechanism. Fig. 12 is a sectional view as on line 12 12 of Fig. 11. Fig. 13 is a detail of a portion of the rotary can-carrying disk, showing by dotted lines the adjustment of the can-receiving saddles therein. Fig. 14 is a detail, partly in section, showing the rubber compressors which serve to press the wrapped or folded ends of the labels in place after the wrapping operation. Fig. 15 is an elevation of the end of the can, showing the manner of wrapping or folding the end of the labels thereon. Fig. 16 is a detail view of the label-applying mechanism.

Referring to the characters of reference, 1 designates the frame of the machine, which may be of any suitable construction.

The label-applying means consists of a runway 3, having a paste-applying roller 3^a therein, over which the can 2 is adapted to pass and which applies paste to said can. Also in said runway is a label-receptacle 3^b, from which the pasted can picks up a label as it passes thereover, the label being rolled onto the can as the can is rolled along the runway propelled by the conveyer-belt 4, which travels in contact with the can's periphery. After the operation of labeling the can 2 is carried through the machine on a runway 3 by means of the endless conveyer-belt 4 engaging said can and driven through the medium of a crank 5 or other source of power, geared to the shaft 6, upon which are mounted the pulleys 7, which drive said belts. Leading from a sprocket-wheel 8 upon the end of the shaft 6 is a sprocket-chain 9, which passes over a like wheel 10, loosely mounted on a shaft 11, and having a hub provided with ratchet-teeth

12. Splined upon said shaft (see Fig. 11) is a sprocket-wheel 13, carrying a spring-actuating pawl 14, which projects from the inner face thereof in the path of the ratchet-teeth on the hub of the sprocket-wheel 10. Interposed between the hubs of the sprocket-wheels 10 and 13 is a coiled spring 15, whose tension is exerted to normally hold the pawl 14 free from the ratchet-teeth 12. Fixed upon the outer end of the shaft 11 is a collar 16, having a V-shaped point 17 projecting therefrom, adapted to lie in a corresponding recess 18 in the hub of the sprocket 13. It will now be understood that a rotation of the shaft 11 sufficient to cause the point 17 on the collar 16 to ride out of the recess 18 in the hub of the sprocket 13 will force said sprocket longitudinally upon said shaft and cause the pawl 14 to engage the ratchet-teeth on the hub of the sprocket 10. Said sprocket being in motion will thereupon impart motion to the sprocket 13, causing said sprocket 13 to drive the chain 19, leading therefrom, and impart motion to the sprocket-wheel 20, to which said chain leads, and which is mounted on the shaft 21 of the wrapping mechanism, transmitting movement to said mechanism for purposes hereinafter explained. When the sprocket-wheel 13 shall have made one complete revolution, the recess in the hub thereof is caused to register with the point 17 on the collar 16, when the spring 15 will move the sprocket 13 longitudinally on the shaft 11, and thereby disengage the pawl 14 from the ratchet 12, when said sprocket 13 will cease to turn and will remain idle until its pawl is again carried into contact with the ratchet 12 by a partial rotation of the shaft 11, as before described. The partial rotation of the shaft 11 is caused through the medium of a crank 22 mounted thereon, to which is pivoted the lower end of an angular connecting-rod 23, whose vertical portion is supported in suitable guides 24 and whose upper end extends horizontally and is attached to a movable platform 25, located in the runway of the cans, and over which the cans are adapted to pass. The cans are held down upon the runway with pressure, so that when a can encounters the platform 25 said platform is depressed, thereby carrying the connecting-rod 23 downward and actuating the crank 22 to rotate the shaft 11 and cause the point 17 on the collar fixed to said shaft to move the sprocket-wheel 13 and carry its pawl into engagement with the ratchets of the sprocket-wheel 10, as before described, whereby the passage of each can from the discharge end of the labeler actuates said clutch mechanism to impart an intermittent movement to the folding and wrapping device, the purpose of which is to prevent feeding into the wrapping device cans faster than said wrapping device is actuated to properly receive and handle the labeled cans presented thereto.

In a labeling and wrapping machine the labels are applied to the cans so as to leave their ends projecting such distance as to entirely cover the ends of the cans when wrapped or folded thereon. The office of the wrapping or folding mechanism is to fold into shape the projecting ends of the label, so that they will lie smoothly upon the ends of the can, and at the same time cause the folded ends of the labels to adhere to the ends of the can in a manner to maintain said folded portions securely in place and present a neat and finished appearance when the operation is completed. The can after passing free from the conveyer-belts rolls onto a concaved plate 26, hinged in the frame of the machine, wherein said can lies until through the operation of the machine, as hereinafter described, said plate is actuated to discharge the can into one of the saddles in the rotary carriage, in which the operation of folding the ends of the labels upon the ends of the can is completed. The rotary carriage consists of two parallel disks 27, mounted upon a shaft 28 and adapted to turn in unison. In the peripheries of said disks are registering concavities, in which are located saddles 29, that receive and support the cans at their opposite sides while passing through the machine, said carrier being rotated intermittently, so as to present each can therein successively into position to receive the action of the various operative parts.

Referring to Fig. 8, it will be seen that the shaft 21 carries upon its side a disk 30, to which a connecting-rod 31 is journaled by means of a crank-pin 32 in the ordinary manner. The lower end of the connecting-rod 31 is pivotally attached to a cross-head 33, adapted to reciprocate vertically in suitable ways in the frame. Projecting laterally from the ends of the cross-head 33 are short rods 34. Mounted upon said rods are set collars 35, which are adapted to slide and which carry in their upper sides pivoted blocks 36, adapted to freely receive the turned ends 37 of the angle-levers 38, pivoted at 39 in the frame. The upper ends of the levers 38 are pivoted to the inner ends of the connecting-rods 40, whose outer ends are pivotally attached at 41 to the cross-bars 42. It will now be understood that through the operation of the cross-head 33 the cross-bars 42 are caused to reciprocate horizontally. Attached to the center of the cross-bars 42 are the rods 43, adapted to slide through suitable bearings 44, and carrying upon their inner ends the heads 45, in which the pivoted folding-fingers 46 are mounted. These heads 45, carrying the folding-fingers, are located exactly opposite each other and on opposite sides of the rotary carrier and are adapted to be moved toward and from each other by the operation of the cross-bars 42. Also connected to the opposite ends of the cross-bars 42 are the rods 47 and 48, respectively. The rods 47 are adapted to slide in suitable guides 49 and carry upon their inner ends the glue-containing cylinders 50. The rods 48 are supported to slide in guides 51 and carry upon their inner ends cups 52, of rub-

ber or analogous material, within which are located blocks 53, as shown in Fig. 14, whose function is to firmly compress the folded ends of the labels against the ends of the can. It will therefore be understood that by the movement of the cross-bars 42 the rods 43, 47, and 48 are simultaneously actuated to carry the glue-cylinders, the folding-heads, and compression-blocks into contact with the ends of the can and label and withdraw said parts from the ends of the can after their operation has been completed.

In the operation of the machine the can last discharged from the labeler lies in the curved hinged plates 26, so that as the succeeding can in its passage from the machinery starts the folding or wrapping mechanism, as before described, the upper end of the connecting-rod 31 engages the curved arm 54, mounted on the shaft between the disks 27, and swings said arm. Pivoted to the arm 54 is a rod 55, whose opposite end is pivoted at 56 to the depending finger 57 of said plate 26, whereby said movement of the arm 54 actuates the plate 26 to carry the can lying thereon into one of the saddles 29, formed in the periphery of the rotary disks 27. In this position the can occupies what might be termed the "first" position in the wrapping-machine and is in direct alinement horizontally with the glue-containing cylinders 50, so that the succeeding operation of the cross-bars 42 carries said cylinders into contact with the opposite ends of the can, causing the protruding valve-stem 58 to strike the ends of the cans and unseat the valves 59, when the slight forward movement of the piston 60 which takes place after the cylinder has been arrested will force a quantity of glue or adhesive through the openings around the stems of the valves and deposit it on the ends of the can. As the glue-containing cylinders recede the spring 61, seated in the piston and engaging the inner ends of the valve-stems, will seat said valves, thereby preventing a further flow of adhesive until the valves are again unseated by a succeeding operation. After the depositing of the adhesive on the ends of the can the succeeding-operation rotates the carrier-disks sufficiently to convey the can into the second position or in horizontal alinement of the folding-heads and bring the succeeding saddle in said carrier into position to receive another can as it is discharged by the plate 26. This intermittent rotation of the carrier-disk is imparted through the medium of the pins 62, projecting from the face of one of said disks and extending into the path of the rotary arm 63, mounted on the a shaft 21 and having a forked end 64, which is adapted to engage the pins 62 as said arm is rotated and carry the disks 27 a distance equal to the space between each set of the operating-heads in the machine, so that each can may be successively presented to said heads to receive their operation. The can now being in alinement with the folded heads and having the ends of the labels projecting therefrom and the glue deposited on the ends thereof, the succeeding operation of the cross-bars 42 will carry said heads forward, so as to cause the fingers 46 to embrace the protruding ends of the label 65, (shown in Fig. 2,) at which time the rod 66, which stands above and parallel to the rod 43 and is adapted to move therewith, is momentarily arrested by the engagement of the set-nut 67 on said rod 66 with the post 68. The forward end of the rod 66 is connected by a pivoted link 68^a with a collar 69, mounted to slide upon the rod 43, a pin 70 in said collar engaging in a curved way 71 in said link, which is fulcrumed at 72 upon a bar 73, attached to the head 45, so that when the rod 66 is arrested the continued forward movement of the head 45 will draw upon and swing said link forward and thereby impart an accelerated forward movement to the collar 69. Said collar being connected to the fingers 46 by means of the curved bars 73^a, which are pivoted at one end to said collar and at the other end to said fingers, which are in turn pivoted at 74 in said head 45, the forward movement of said collar will fold said fingers inward, so as to form a series of plaits in the projecting ends of the label and fold them upon the ends of the can. The rear end of the rod 66 is supported upon an arm 75, which is pivoted at its upper end thereto and at its lower end to the connecting-rod 40. Said arm 75 normally stands at a slight incline; but as the rod 43 moves forward after the rod 66 has been arrested said arm 75 straightens and raises the nuts 67 free from the post 68 at the time when the fingers 46 have completed the folding of the end of the label, when a further forward movement of the head 45 carries its solid rubber center 76 against the folded end of the label and compresses it, the inner ends of the fingers 46 swinging into the diametrical channels 77, formed in said head 76. This formation permits said fingers to swing beyond the line of the face of said head, which position of parts is shown by dotted lines in Fig. 9. After folding and compressing the ends of the labels a further operation of the machine carries said parts back to their normal position in readiness for a succeeding operation on the next can which is presented thereto. The next operation of the machine, which presents a succeeding can in the path of the folding-heads, also presents another can to the operation of the gluing cylinders and carries the can last acted upon by the folders into position to receive the action of the compression-blocks 53, surrounding which are the rubber cups 52. As the label-compressors are brought together upon the ends of the can the surrounding rubber cups engage the protruding ends of the folded labels and carry them properly into place, when the compressors are brought forcibly against the folded ends of the label, firmly setting the plaited and folded parts and forcing them into contact with the glue or adhesive on the ends of the

cans, thereby maintaining the folded or wrapped ends of the labels in place, as clearly shown in Fig. 15.

It will now be understood that when the machine is in operation the rotary carrier-disks will contain three cans and that all three of said cans will be operated upon simultaneously, that each can will require three operations to complete the folding or wrapping process—namely, the operation of the glue-cylinders to deposit the glue thereon, the operation of the folding-heads to fold the ends of the label onto the ends of the can, and the operation of the compressors to set and fix in place the folded ends of the label; but as the carrier will contain three cans the compressors will be operating while the glue-cylinders are depositing the glue, and the folders will operate at the same time the can is being glued and the folded label ends are being compressed. As explained before, each can that passes from the labeler imparts a movement to the wrapping or folding mechanism and each movement of said mechanism causes a reciprocation of the opposed heads, cylinders, and compressors in each position in which the can is at rest during its passage through the machine.

It is necessary that the rotary carriage comprising the disks 27 shall be securely locked while the cans carried thereby are being operated upon. To effect this locking of said carriage, one of the disks 27 is provided with a series of apertures 78, with which a pin 79, (see Fig. 8,) mounted in the frame, is adapted to register. Pivoted to one of said pins is a lever 80, whose free end depends in the path of a cam-disk 81, mounted on the shaft 21. Said cam-disk is so set that its high point will engage said lever and withdraw the pin 79 from the aperture in said disk at the time when said carriage is actuated, but again enters the succeeding hole through the action of the spring 82 upon the lever 80 when the carrier has been rotated such distance as to bring the can thereon into proper position, the apertures 78 in said disk being so positioned as to effect this result.

To maintain the cans properly within the saddles of the carrier as said carrier is rotated, the flexible springs 83 and 84 are employed, (see Fig. 4,) which bear upon said cans and hold them securely in place.

As the cans are discharged from the carrier after completing the operation of folding the ends of the label they fall into a suitable chute 84 at the tail of the machine, provided with projecting sides 85, which embrace and maintain the folded labels in place.

The adhesive-containing reservoir 86 is supported upon a rod 87 and has flexible pipes 88, leading to a bent tube 89, (see Fig. 7,) which projects through the cylinder 50 and passing through the piston 60 communicates with the glue-space in the cylinder in advance of said piston.

The folding-heads 45 are provided on their under face with an antifriction-roller 90, which is adapted to run upon a track 91 and support said heads in their operation. (See Figs. 2 and 3.)

Upon referring to Fig. 13 it will be seen that the saddles 29 in the carrier-disks 27, which receive and support the cans, are mounted in sockets 92, in which the stems of the saddles are made to adjust vertically and are held by means of the screws 93, so that said saddles may be raised or lowered to accommodate any variation in the size of the cans.

Having thus fully set forth this invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a label-folding machine the combination of a carrier adapted to support the cans with the labels projecting from the ends thereof, means for imparting movement to said carrier, means for applying an adhesive to the ends of the can, means for folding the projecting ends of the label onto the can and compressing said folded ends securely in place.

2. In a label-folding machine, the combination of a carrier adapted to carry the labeled cans, reciprocatory non-rotative heads carrying movable fingers adapted to engage and fold the projecting ends of the label onto the ends of the can and means for imparting movement to said heads.

3. In a label wrapping or folding machine, the combination of a movable carrier adapted to receive the labeled cans, reciprocatory heads with which the cans in the carrier are brought into alinement, a series of fingers pivoted to said heads adapted to embrace the projecting ends of the label, means for reciprocating said heads and means for actuating said fingers to fold the ends of the label onto the ends of the cans.

4. In a label-folding machine, the combination of a carrier adapted to receive the labeled cans, means for applying adhesive to the ends of the cans, reciprocatory heads with which the ends of the can are brought into alinement after the adhesive is deposited thereon, movable fingers in said heads adapted to engage and fold the projecting ends of the label and carry said folded ends into contact with the adhesive on the can and means for reciprocating said heads and imparting a movement to said fingers.

5. The combination of a movable carrier, adapted to receive the labeled cans, means for folding the projecting ends of the label onto the ends of the can, reciprocatory compressors, with which the ends of the labeled cans are brought into alinement, said compressors comprising rubber or elastic cups adapted to engage the margins of the folded ends of the label and a central block within said cups adapted to be brought forcibly into contact with the label's folded ends.

6. In a labeler and wrapper, the combination with the label-applying mechanism of the label folding or wrapping mechanism, the label-applying mechanism having a continu-

ous movement, the wrapping or folding mechanism adapted to have an intermittent movement, means connecting the label-applying mechanism with the wrapping or folding mechanism adapted to be actuated by the passage of the cans from the label-applying mechanism to impart an intermittent movement to said wrapping or folding mechanism.

7. In a label-wrapping machine, the combination of a rotary carriage adapted to contain the labeled cans, reciprocatory rods on each side of said carrier carrying adhesive-applying, label-folding and label-compressing devices, means for reciprocating said devices simultaneously, means for rotating the carriage intermittently to bring each can in succession into alinement with said operative devices and means for arresting the movement of said carriage while said operative devices are in action.

8. The combination of the label folding or wrapping mechanism, the continuously-operating labeling mechanism, gearing connecting the label-folding mechanism with the labeling mechanism, said gearing being normally at rest, a lever adapted to throw said gearing into action said lever extending into the path of the rolling cans whereby the passage of each can through the labeler imparts a movement to the label-folding mechanism.

9. A label-folder comprising reciprocatory heads carrying pivoted fingers adapted to embrace the projecting ends of the label, said fingers being mounted to describe a circle in said heads their free ends being adapted to swing inwardly into channels in the head's center, a sliding collar on the stem of said heads, pivoted bars connecting said collar with said fingers and means for sliding said collar to impart a movement of the fingers, substantially as specified.

10. In a label-folding machine, the combination with the operative parts and movable carriage, of the reciprocatory heads, each head having a series of pivoted fingers therein set in a circle, whose free ends embrace the projecting ends of the label on the can, curved bars pivoted to the rear ends of said fingers and to a collar mounted to slide upon the stem of said heads, said collar being adapted to move with said head and to have a movement independent thereof.

11. The combination with the label folding and compressing machine, of the glue-containing cylinders adapted to be brought into contact with the ends of the can, movable pistons in said cylinders, spring-actuated valves seated in the pistons of said cylinders having projecting stems which extend through the end of the cylinders whereby the valves are unseated when the cylinders are brought into contact with the ends of the can.

12. In a label-folder, the combination of the reciprocatory adhesive appliers, folding-heads and label-compressors adapted to be reciprocated in unison, a carriage located between said reciprocatory parts and adapted to contain a plurality of cans and support said cans with their ends in alinement with said reciprocatory parts, means for operating said parts to cause them to act upon the plurality of cans simultaneously and means for moving said carriage to bring each can in succession into position to receive the operation of said parts.

13. In a label-folding machine, the combination with the label folding and compressing means of a carriage rotating about a central axis having a series of saddles in its periphery adapted to receive the cans and means for adjusting said saddles radially of said carriage.

14. In a label-folding machine, the combination with the adhesive-applying, label folding and compressing mechanism of the movable cross-bars for imparting a reciprocation to said mechanism, pivoted angle-levers for imparting movement to said cross-bars, a cross-head adapted to reciprocate vertically, and carry horizontally-adjustable couplings mounted on said cross-head, said couplings being movably attached to the end of said levers.

In testimony whereof we sign this specification in the presence of two witnesses.

FRED H. KNAPP.
CLARENCE W. BLACKSTONE.

Witnesses:
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