

Nov. 5, 1957

R. GUILLEMINOT ET AL

2,811,916

PACKAGING MACHINE

Filed June 30, 1954

8 Sheets-Sheet 1

FIG. 1

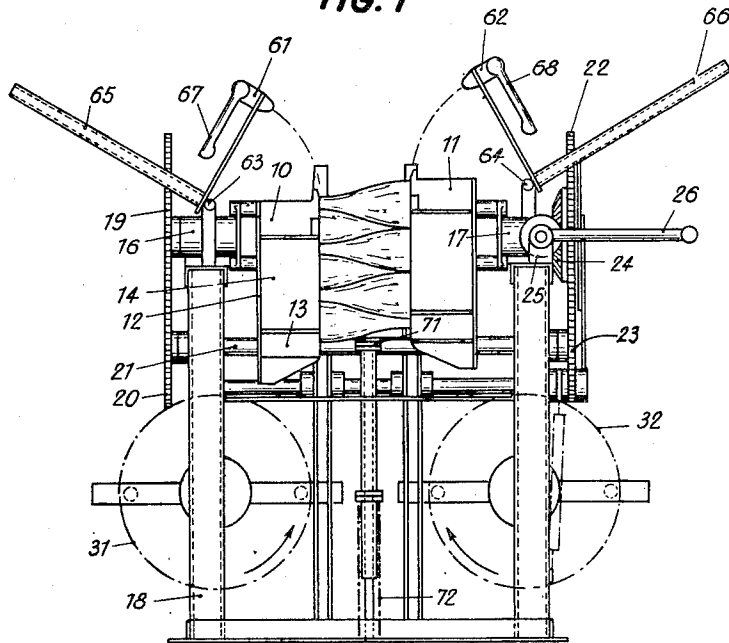
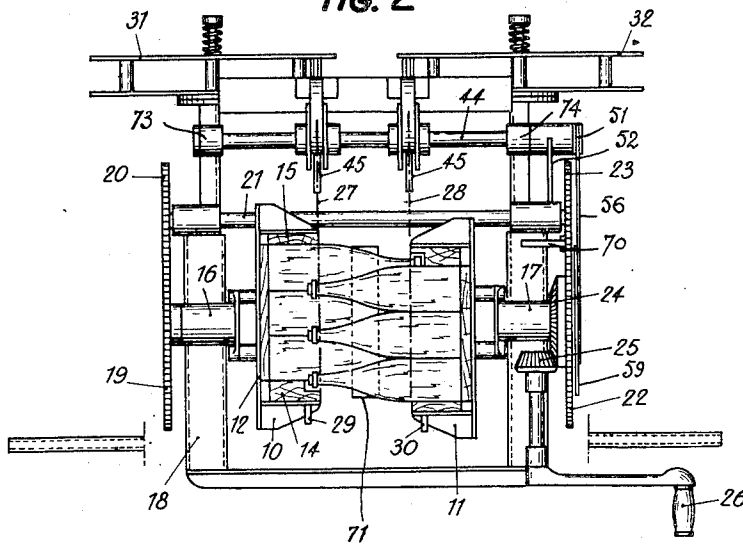


FIG. 2



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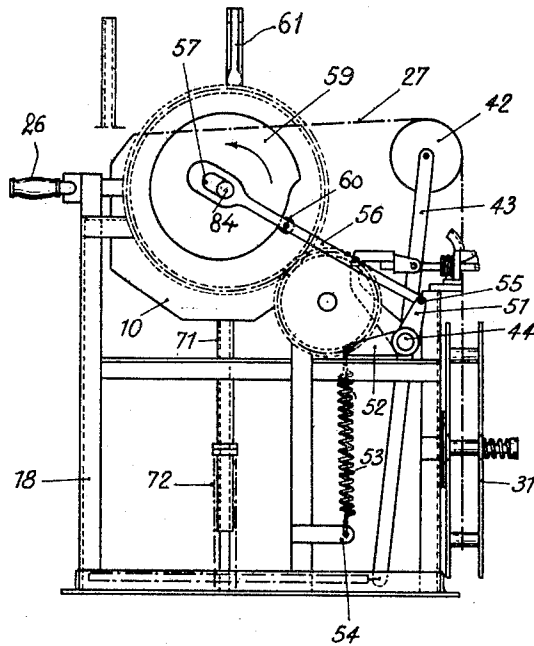
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Fig. 3



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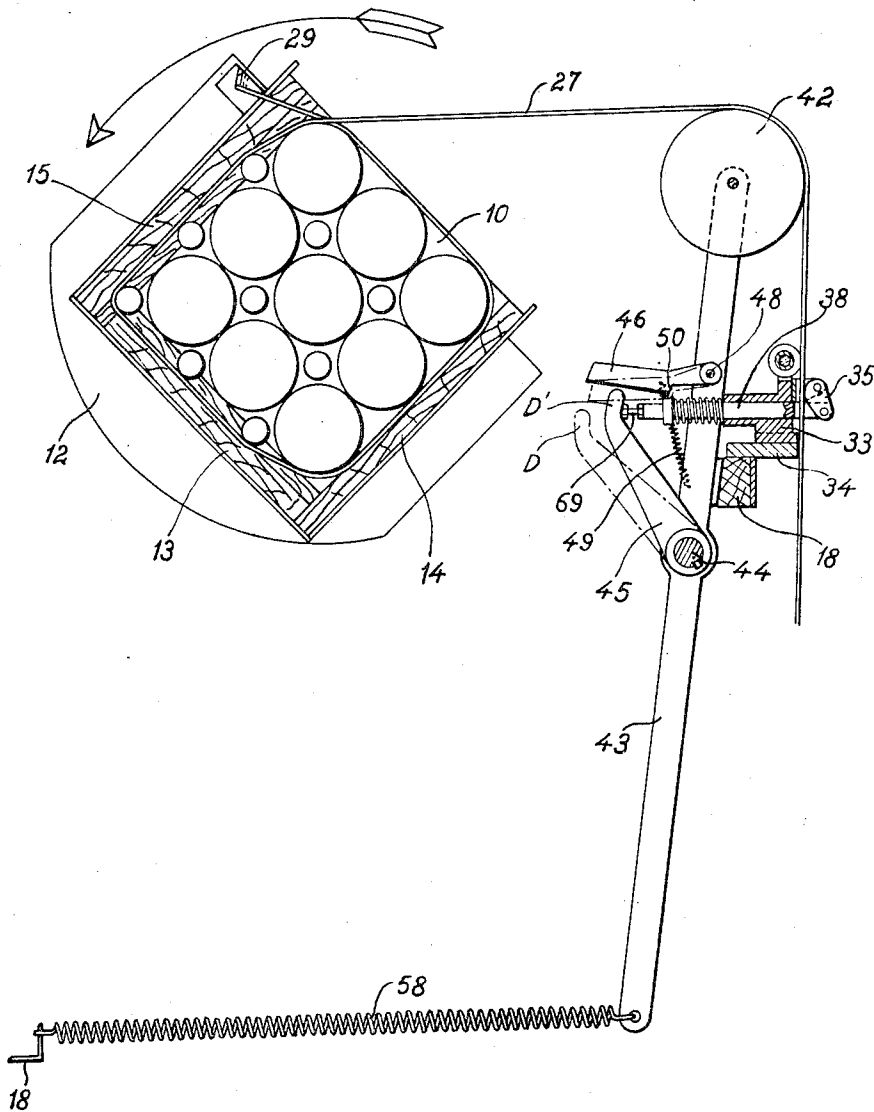
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Fig. 4



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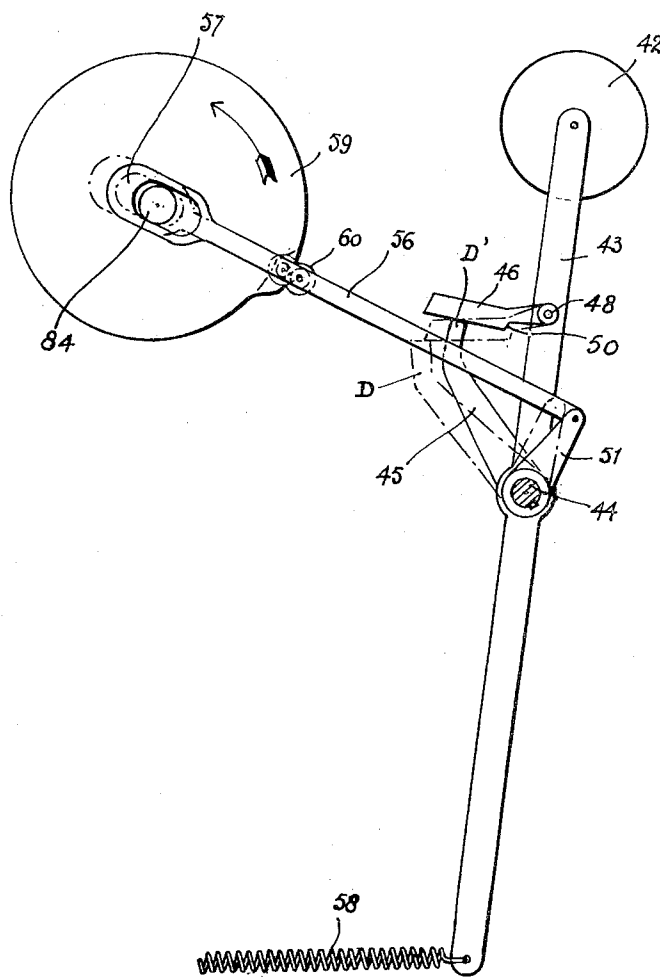
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FIG. 5



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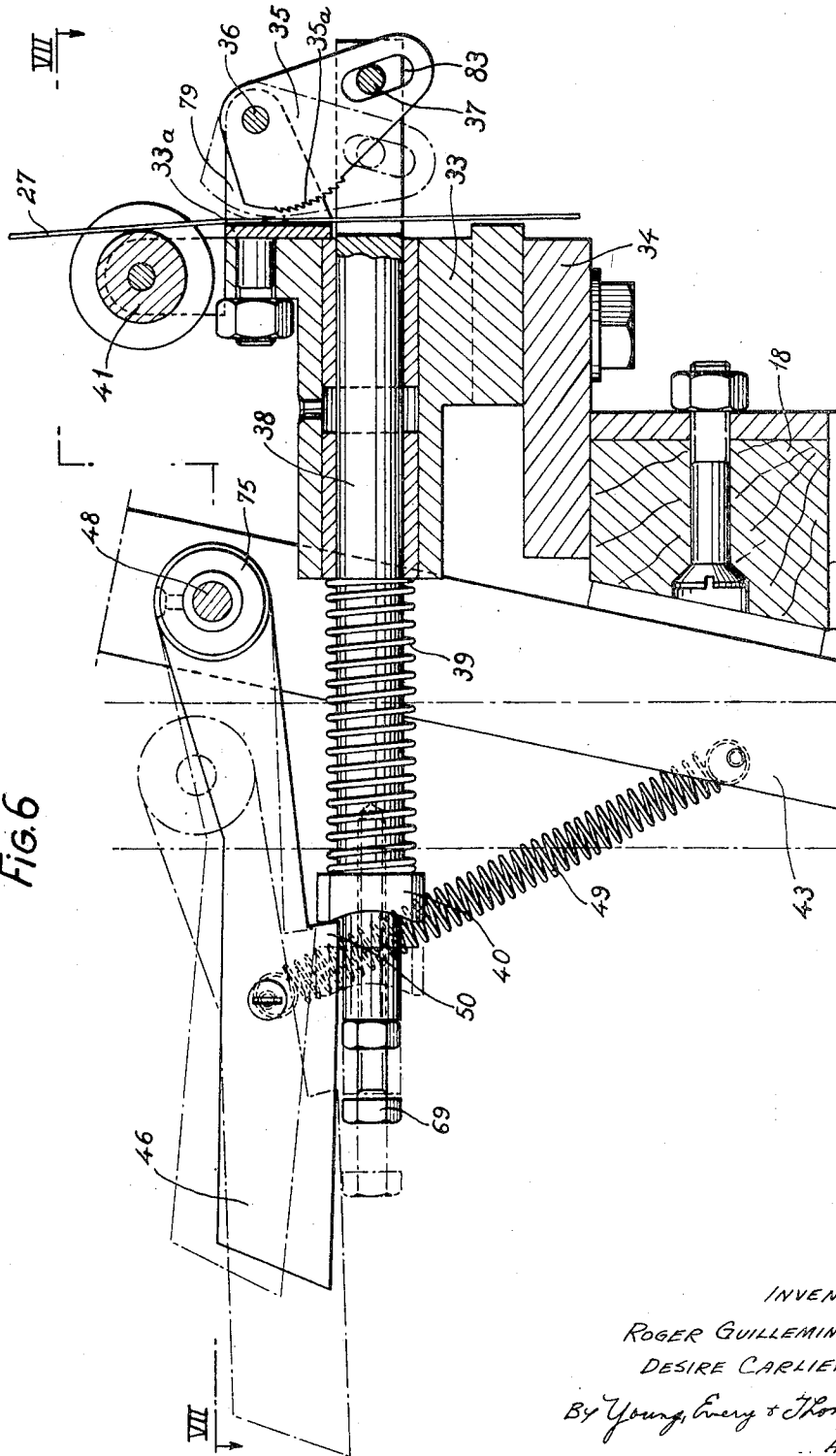
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Fig. 6



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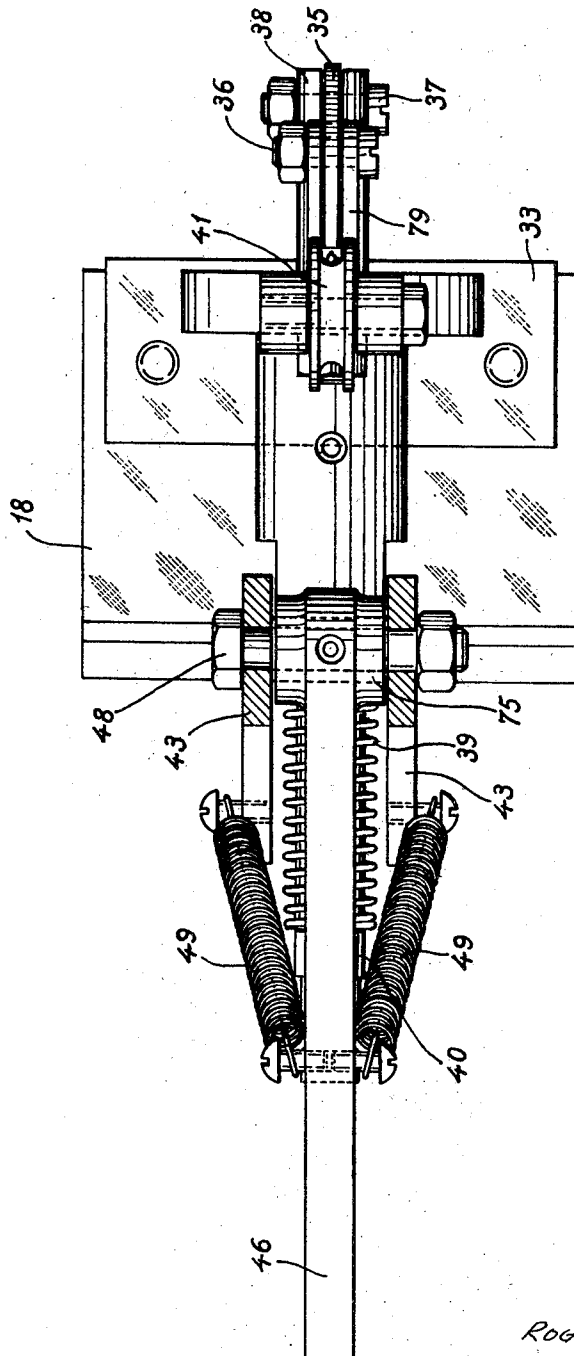
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FIG. 7



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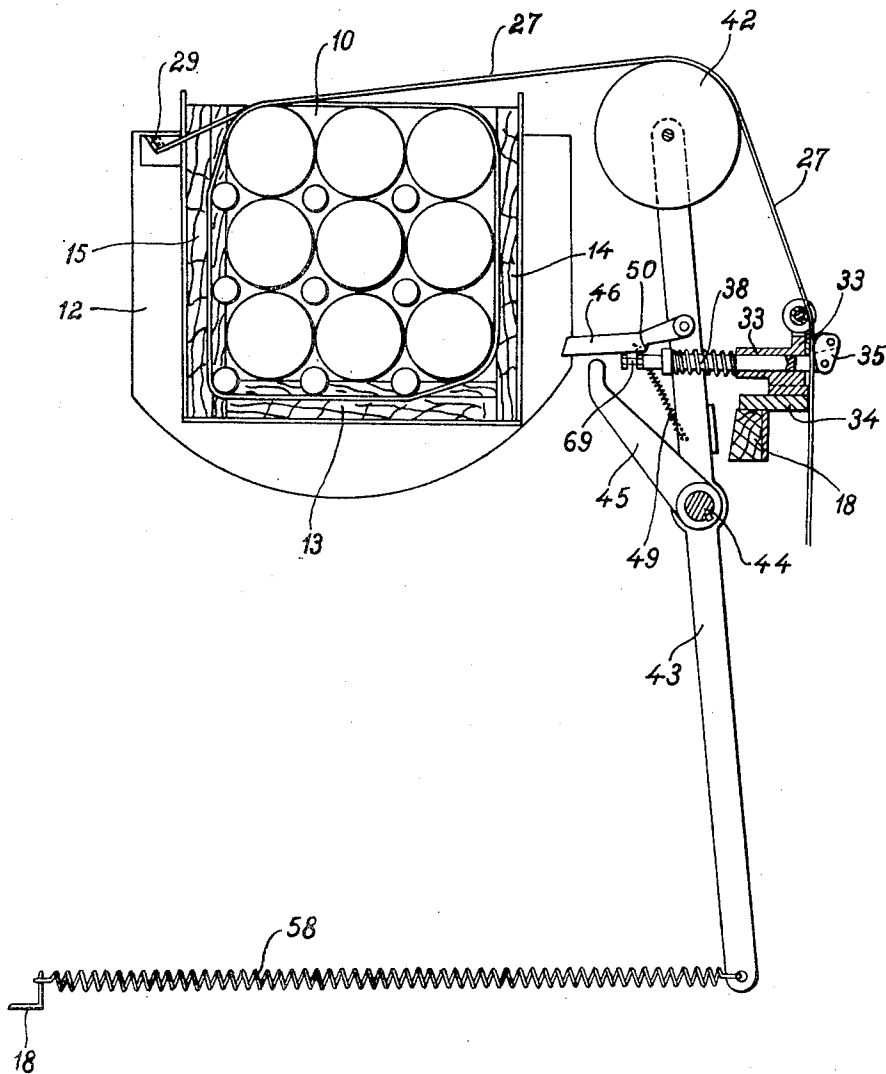
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Fig. 8



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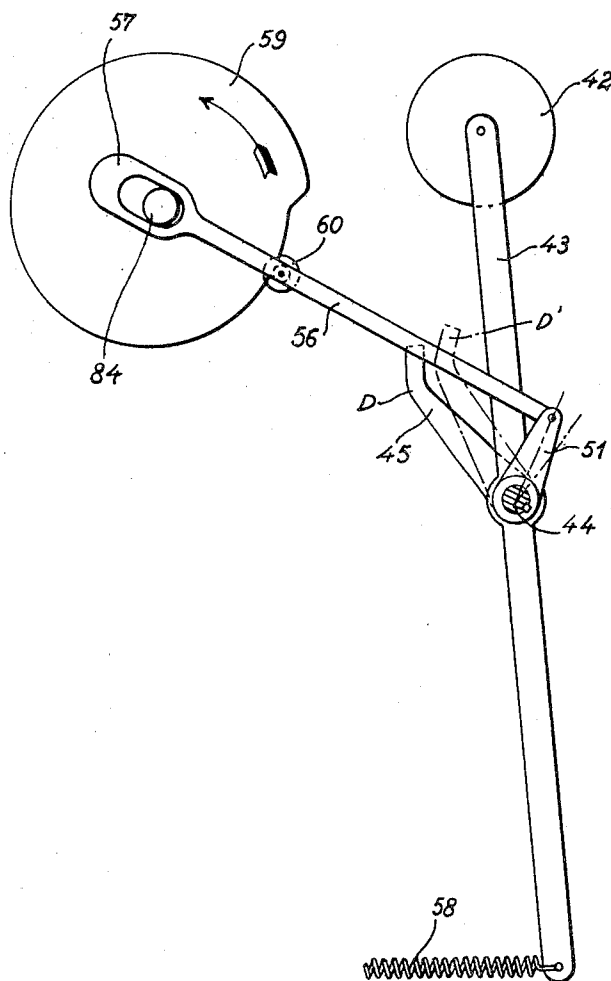
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Fig. 9



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2,811,916

PACKAGING MACHINE

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Application June 30, 1954, Serial No. 440,484

Claims priority, application France July 1, 1953

4 Claims. (Cl. 100—15)

The present invention relates to a machine intended for packaging any articles such as bottles, or flasks, receptacles, tubes, etc.

This machine is of the type in which the articles to be packaged are arranged in twin rotary cradles, and comprising a device for delivering spaced binding wires round the articles carried by the cradles, and a device for tightening the wires during the final stage of the cycle of rotation of the cradles.

It is a feature of the invention that the device for tightening and restraining each binding wire consists of a pulley for unwinding the wire carried by a resiliently restored rocking lever and of a jaw brought into action to grip the wire, and of a ratchet mechanism controlled by the rotation of the cradles.

The accompanying drawings illustrate by way of example, one embodiment of the machine according to the invention. In the example selected, the machine is intended for packaging bottles, by the method described in the U. S. patent application filed in U. S. A. on August 5, 1953, under No. 372,549, now Patent No. 2,755,923. But it is understood that the machine may be used, with the necessary adaptations, for packaging any other articles.

Figure 1 is a view of the machine in side elevation,

Figure 2 is a plan view, the binding devices being removed,

Figure 3 is a view in side elevation,

Figure 4 shows a side elevation to a larger scale, of the mechanism for clamping the binding wires,

Figure 5 is a partial view similar to that shown in Figure 4, and showing the control of the mechanism for clamping the wires,

Figure 6 is a partial view in cross-section to a larger scale of the arrangement shown in Figure 4,

Figure 7 is a cross-sectional view taken along line VII—VII of Figure 6,

Figure 8 shows the same mechanism in the position immediately following that shown in Figure 4,

Figure 9 is a partial view showing the control of the mechanism in the position shown in Figure 8.

The machine consists of twin cradles 10 and 11 supporting the bottles to be packaged. The cradle 10 comprises a vertical base 12 and three side members 13, 14, 15, the fourth side remaining open for the passage of the bottles. The cradle 11 is made in the same way with a vertical base and three side members, the fourth side remaining open.

Each of the cradles 10 and 11 is shaped and dimensioned according to the features of the articles to be packaged, hence, in the case illustrated, according to the shape of the bottles and their overlapping arrangement. In this case the cradles are preferably made of metal lined with resilient material such as wood.

The base 12 of the cradle 10 carries a shaft 16, and the base of the cradle 11 carries a shaft 17, the two shafts 16 and 17 having the same axis of rotation. These

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shafts are mounted in suitable bearings resting on the frame 18.

The shaft 16 carries a gear 19 engaging with a gear 20 carried by the shaft 21. The shaft 17 carries a gear 22 engaging with the gear wheel 23 likewise keyed to the shaft 21. The combination of these gears ensures the simultaneous rotation of the two cradles 10 and 11.

These gears are controlled by a bevel gear 24 fixed to the shaft 17 engaging with a bevel gearwheel 25 rigidly secured to the operating handle 26. The gears 24 and 25 are provided to ensure suitable reduction so as to ensure operation with a limited amount of effort. For example, two turns of the handle 26 cause the cradles 10 and 11 to make one synchronised revolution.

As can be seen, the two cradles 10 and 11 are spaced apart leaving a gap between them for the passage of the packaging bond or bonds, which wind round the bottles without encountering any obstacle in the vertical plane. Said bonds may, for example, be two metal wires 27, 28.

Each of the cradles 10 and 11 carries a device 29 and 30 respectively, intended to receive and hold the extremity of the wire 27 or 28. This device may be of any suitable form.

Each of the wires 27 or 28 is taken from a reel 31 or 32 respectively, rotatably mounted on the frame 18. A mechanical clamping device is provided in the case of each wire, this device being described below with reference to the wire 27, it being understood that the same arrangement will apply to the wire 28.

The clamping device comprises an anvil-support 33 (see Fig. 4) fixed on the bracket 34 which is mounted on the frame 18. The portion of the anvil which makes contact with the wire 27 is indicated at 33a on Fig. 6.

This portion 33a cooperates with a jaw 35 pivotally-mounted on the pivot axis 36 which is carried on the extensions 79 rigidly fixed to the member 33. The jaw 35 has a serrated portion 35a.

On the lower end of jaw 35 is a slot 83 in which is positioned a pin 37 mounted on rod 38, which is adapted to slide horizontally. The rod 38 is urged towards the left, as seen in Fig. 6, by means of a spring 39 bearing against the abutment or plate 40 which is rigidly fixed to the rod 38.

At the extremity of the rod 38 there is provided an adjusting screw 69. A guiding member for the wire, a small roller, for example, is provided at 41.

In order to guide the wire 27 when it leaves the anvil 33 and the jaw 35, a pulley 42 is carried by the double arm 43 which is pivotally mounted on the shaft 44. This shaft is carried in two bearings 73, 74, fixed to the frame 18. At its lower extremity, the arm 43 is coupled to one end of a return spring 58 which is fixed at its other end to the frame 18.

On the shaft 44 is keyed the lever 45, the extremity of which is slightly angled. On this extremity of the lever 45 is supported a finger 46 rigidly fixed to a sleeve 75 adapted to pivot at 48 on the arm 43. Two springs 49 fixed to the finger 46 and also coupled to the arm 43 urge finger 46 downwardly. Finger 46 is provided at 50 with a hook which is intended to engage with the plate 40 on the rod 38.

On the shaft 44 is also keyed a double lever 51, 52. The spring 53 has one end attached to the lever 52 and is fixed at its other end at 54 to the frame 18 (see Fig. 3). The lever 51 is pivotally coupled at 55 to an arm 56. The arm 56 is provided at its extremity opposite to 55 with a widened portion provided with an elongated slot 57, which is engaged on the shaft 84, the latter being rigidly fixed to the cradle 11 and arranged coaxially with the shaft 17.

The shaft 84 carries a cam 59 which rotates with it. A rotatable roller 60, which is carried on the arm 56 engages the surface of this cam.

Binding devices 61, 62, of known type, are located at the upper part of the machine. Each of these devices is mounted on hinges 63 and 64 and is lowered at the desired moment upon the wires to be bound, by the levers 65, 66. The binding operation of the devices 61, 62, is effected by means of the levers 67 and 68.

In order to make up a package of bottles, namely a package of 18 bottles in the case of the example chosen, the bottles are placed in the cradles 10 and 11 in two interpenetrated piles, the necks of one pile being located in the empty spaces between the bottle necks of the other pile. The ends of the wires 27 and 28 are fixed in position at 29 and 30. By actuating the crank-handle 26, the whole assembly of the two cradles is given one complete turn, which unwinds the wires from the reels 31 and 32, while retaining the bottles in position during this rotational movement.

When the assembly of the two cradles has turned through three quarters of one turn (see Figs. 4 and 5), the roller 60 which is engaged on the cam 59, moves away from the axis of the cam and causes a pivotal movement of the lever 51 with a resulting movement of the shaft 44.

As it pivots, the shaft 44 drives the lever 45, which passes from the position D to the position D'. This movement of the lever 45 raises the finger 46 and disengages the hook 50 from the member 40 which frees the rod 38, the latter then being pushed over to the left (the position shown in dotted lines in Fig. 6) by the spring 39. The rod is thus moved until its extremity, the screw 69, comes up against the lever 45 (in the position D' shown in Fig. 4). This slight displacement is regulated by means of the screw 69 so that it is insufficient to lock the jaw 35 on the anvil 33. The wire 27 can thus continue to slide over the anvil 33.

The rotation of the frames 10 and 11 and of the cam 59 continues and the roller 60 passes into the reentrant portion of the cam, thus moving closer to the shaft 84. This movement causes displacement of the arm 56 which causes the lever 51 to pivot and thus also rotates the shaft 44 and the lever 45. The latter returns abruptly to its initial position at D.

The pivotal movement of the lever 45 frees the extremity 69 of the rod 38. The latter moves towards the left under the action of the spring 39, rotating with it the shaft 37 which causes the jaw 35 to pivot and the latter is thus forced against the anvil 33, thus gripping the wire 27 (the position shown in chain-dotted lines in Fig. 6).

The cradle 11 continues its rotation (see Fig. 8), the wire 27 being gripped fast by the jaw 35. The tension applied to the wire 27, which is gripped in this way, forces the arm 43 and the pulley 42 to pivot about the shaft 44. This pivotal movement stretches the spring 58 and this produces by reaction the tension effort on the wire 27.

A suitable stop device 70, for example of the spring type, may be provided in order to maintain the cradle in position at the end of its rotational movement, the wire 27 remaining tightly gripped and tensioned.

The winding and tightening of the wires 27, 28 having thus been ensured, the tying devices 61 and 62 are lowered onto them by means of the levers 65, 66. An alternating movement of the lever 67 and 68 enables the wires to be tied and cut in the known manner.

The cutting of the wires releases the spring 58, restoring the double lever 43 to its initial position. The wires are still held by the jaw 35. In its return movement the lever 46 engages the abutment or stop 40 which moves the rod 38 which releases the jaw 35. The wires

27—28 can then be picked up again and attached at 29 and 30 for a fresh operation.

The gap between the two cradles 10 and 11 may comprise a support 71 having a spring 72, to facilitate placing the bottles in position.

What we claim is:

1. A machine for packaging bottles and similar articles, comprising a frame, two cradles rotatably mounted on the said frame, means for causing the said cradles to rotate through one single turn, two reels each delivering a binding wire, a clamping device on each of said cradles for the extremity of the wire delivered by one of the said reels, a device for tensioning and clamping each said binding wire, the last-mentioned device comprising a pivoted lever having a restoring spring, the said lever carrying a pulley for guiding the wire, an anvil rigidly fixed to the said frame, a jaw adapted to clamp the wire to the said anvil by pivotal movement, a mechanism carried by the said lever and actuating the said jaw, and means for controlling the said mechanism, the last-mentioned means being operated by the rotation of the said cradles.

2. A machine for packaging bottles and similar articles, comprising a frame, two cradles rotatably mounted on the said frame, means for causing the said frames to rotate through one single revolution, two reels each delivering a binding wire, a clamping device on each of said cradles for the extremity of the wire delivered from one of the said reels, a tensioning and clamping device for each said binding wire, the last-mentioned device comprising a lever adapted to pivot about a fixed axis on said frame, a restoring spring for the lever, the said lever carrying a guiding pulley for the said wire, an anvil rigidly fixed to the frame, a jaw to clamp the wire on the said anvil, a rod attached to the said jaw, a stop member on the said rod, a spring around the rod tending to urge the jaw into clamping engagement with the wire, a hook pivotally mounted on the said lever and engageable with the stop member of the rod, a finger on said hook and serving as an abutment for the said rod when the hook is disengaged, a second lever adapted to pivot about said axis and adapted to actuate the said finger and to liberate the said rod whereby said jaw is moved to clamp the wire, and means for operating the said second lever in cooperation with the rotation of the said cradles.

3. A machine for packaging bottles and similar articles, comprising a frame, two cradles rotatably mounted on the said frame, means for causing the said cradle to rotate through one single revolution, two reels each delivering a binding wire, an attachment device on each of said cradles for the extremity of the wire delivered by one of the said reels, a tensioning and clamping device for each said binding wire, the last mentioned device comprising a lever adapted to pivot about a shaft on the frame and having a restoring spring, the said lever carrying a guiding pulley for the said wire, an anvil rigidly fixed to the said frame, a jaw to clamp the wire on the said anvil, a rod attached to the said jaw, a stop member on the said rod, a spring around the rod tending to urge the jaw into clamping engagement with the wire, an attachment member on the rod, a hook pivotally mounted on the said lever and engageable with the said stop member of the rod, a finger on said hook and serving as an abutment for the said rod when the hook is disengaged, a second lever adapted to pivot about said shaft and adapted to actuate the said finger and to free the said rod, an arm hingedly fixed on the said second lever and carrying a roller, and a cam rotatably driven with the said cradles and against which the said roller is engaged, the movements of the said cam being adapted to cause pivotal movement of the said second lever and to free the said rod, thereby insuring the clamping of the wire by the said jaw.

4. A machine for packaging bottles, comprising a frame, two spaced cradles mounted on said frame for rotation

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about a common axis, means to cause said cradles to rotate through a single revolution, two reels associated with said frame for delivering binding wire during rotation of said cradles, a clamping device on each of said cradles each adapted to clamp one of said wires, and devices for tensioning said wires during their delivery, each of said tensioning devices comprising a lever pivotable about a second axis generally parallel to the axis of said cradles, a pulley rotatably supported at the upper end of said lever about a third axis generally parallel to said other axes, a spring urging the upper end of said lever away from said cradles, an anvil rigidly fixed to said frame and a movable jaw in juxtaposition therewith, said wire passing between said anvil and jaw, means urging

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jaw towards said anvil, means deterring said jaw, and means responsive to the rotation of said cradles for releasing said deterring means, whereby upon substantial completion of said revolution, and said release means will release said said deterring means and thereby permit said jaw to clamp said wire, further rotation of said cradles causing said lever to pivot against the urging of its spring, thus maintaining tension on said wire.

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