June 30, 1953 L. BROOK 2,643,500

WRAPPING MACHINE

Filed April 21, 1952 3 Sheets-Sheet 1

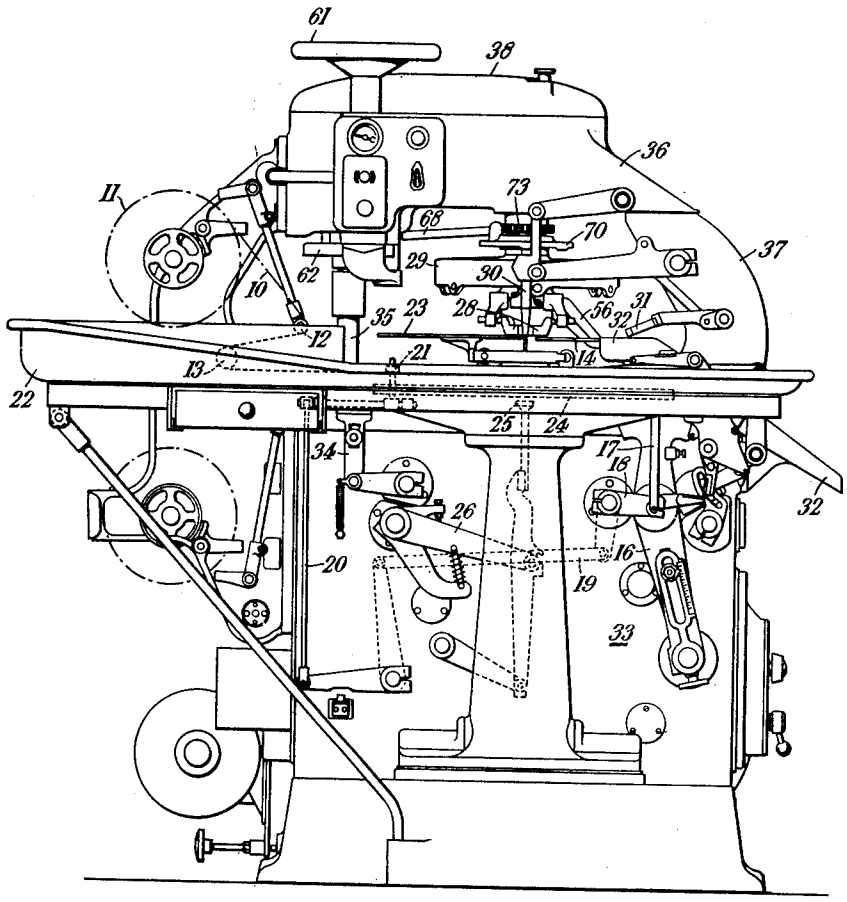


Fig. 1.

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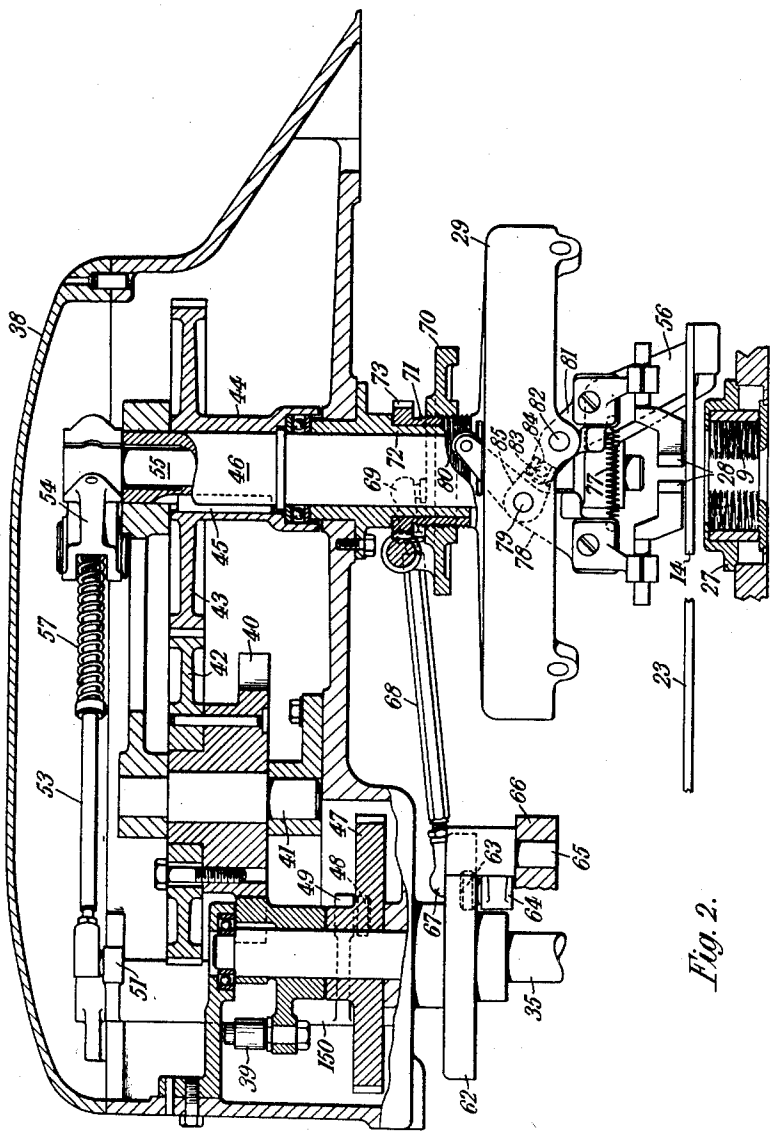


Fig. 2.

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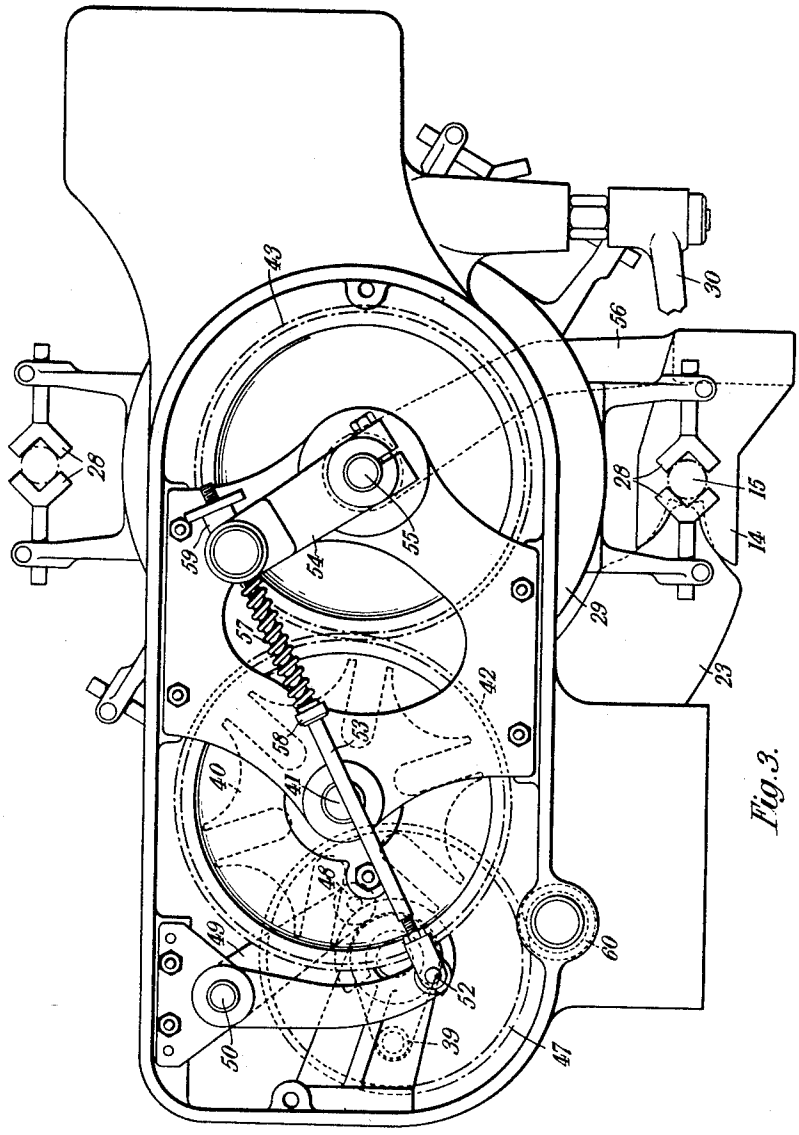


Fig. 3.

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2,643,500

WRAPPING MACHINE

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Application April 21, 1952, Serial No. 283,334
In Great Britain April 18, 1951

5 Claims. (Cl. 53—126)

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In bunch wrapping machines, articles to be wrapped are lifted in succession from a feed disc, by a lifting plunger, each article being carried, together with a wrapper fed into position above it, through an orifice (usually lined with an annular brush) and into grippers on a carrier head.

As the result of the passage of the article through the orifice, the wrapper is draped about it in the form of a downwardly open cup, and the depending portion of the wrapper at one side of the article is folded up against the base of the article, after it has been gripped by the grippers and the lifting plunger has retired, by a moving first folder. The depending portion of the wrapper at the other side of the article is thereafter folded against the base of the article by a fixed folder over which the article is traversed by movement of the carrier head on its way to a sealing station at which the folded pleats of wrapper are pressed against the base of the article by a heater pad.

The carrier head revolves about a vertical axis and it is necessary to impart intermittent rotation to it and also to impart opening and closing movement at appropriate times to the grippers on the carrier head.

Recently a bunch wrapping machine has been developed having a suspended carrier head, the rotary movement being imparted to the carrier head and the opening and closing movements being imparted to the grippers from a top gear box beneath which the carrier head is suspended. This arrangement has the advantage of affording minimum obstruction at the sides of the carrier head and facilitates the disposition of the heater pad operating mechanism and also of mechanism for actuating an ejector plunger for discharging the wrapped articles from the carrier head and a top plunger which coacts with the lifting plunger during the lifting of the articles into the grippers on the carrier head.

The invention provides a wrapping machine organised for bunch or twist wrapping and having a suspended carrier head, a gear box above the carrier head, a tubular shaft depending from the gear box and serving to impart intermittent rotation to the carrier head, and a spindle depending through the tubular shaft and carrying the first folder, the spindle coacting with a cam in the gear box to impart operating movement to the first folder. The operation of the first folder from the top gear box gives further clearance for coaction of other parts with the carrier head.

One specific embodiment of confectionery

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wrapping machine according to the invention, which is interchangeable from bunch to twist wrapping as described in my copending U. S. Application, Serial No. 283,332, will now be described in detail, by way of example, with reference to the accompanying drawings. The first folder operates in the same way whichever mode of wrapping is selected. In the drawings:

Fig. 1 is a side elevation of the machine,

Fig. 2 is a vertical section, on a larger scale, through the top gear box, and

Fig. 3 is a plan view of the top gear box with the cover removed.

Like reference numerals indicate like parts throughout the figures.

Considering first of all Fig. 1, a web 10 of wrapping material is periodically fed by a picker (not shown) from a reel 11 over rollers 12, 13 and along a feed table to a pair of cutting knives. The knives (also not shown) are periodically operated, as fully described in U. S. application, Serial No. 283,332, to sever a wrapper from the leading edge of the web. A second reel 111 of wrapper is provided for use when the reel 11 is exhausted.

The picker-actuating mechanism is fully described in U. S. application, Serial No. 283,332 and it will be sufficient to explain here that a bell crank 16 is periodically oscillated by a cam to impart forward and return strokes to the picker, while a link 17 is periodically raised and lowered by a cam-operated lever 18 to close and open the picker jaws. The lever 18 is coupled by a linkage 19 and a rod 20 to a clamp 21 which is lowered to clamp the web of wrapping material when the knives are operating and is moved to inoperative position when the picker jaws close to feed the wrapper forward.

The tablets to be wrapped are fed by hand in succession from a hopper 22 into recesses in a horizontal feed disc 24, which is intermittently rotated, in an anticlockwise direction as seen from above, to bring the tablets in succession into position above a lifting plunger 25. This is periodically lifted by a cam-operated linkage 26 to lift a tablet, and the wrapper which has been fed by the picker into position above it, through an annular brush 9, Fig. 2, contained in a member 27 and into a pair of grippers 28 on a carrier head 29, a cam-operated top plunger 30 having previously descended through the brush to press the wrapper against the tablet during its transit through the brush. The carrier head 29 is intermittently rotated and the wrapping of the tablets is completed on the carrier head as

described in U. S. application, Serial No. 283,332.

After the grippers 28 have closed on a tablet 15, lifted into them by the lifting plunger at the loading station, a first folder 14 (Figs. 2 and 3) is moved, as later described, across the base of the tablet to fold part of the depending wrapper against it. The carrier head, which is intermittently rotated about a vertical axis by a Geneva mechanism, also as later described, then carries the tablet on to a heating station, the tablet moving over a fixed folder plate 23 which folds the remaining dependent portion of the wrapper against its base.

As described in U. S. application, Serial No. 284,996, at the heating station a heater is pressed against the base of the tablet to produce a heat seal between the pleats of wrapper folded against the base, and a top padder presses against the top of the tablet. At the next station to which the tablet is moved by the carrier head, a cooling pad is pressed against the base of the tablet and a top padder against its top. At the next station a cooling pad is pressed against the base of the tablet. At the next and last station, the gripper jaws are opened by their cam and an ejector 31 (Fig. 1) ejects the wrapped and heat sealed tablet down a chute 32.

The machine has a bottom gear box 33, disposed beneath the feed disc 24 and containing cams for operating the wrapper feed mechanism, 16, 17, the lifting plunger 25, the top plunger 30 and ejector 31, a bar 34 for actuating the knives, and the heater mechanism. A vertical shaft 35 driven from the bottom gear box extends upwardly into a top gear box 36, supported by a pillar 37 and fitted with a removable cover 38. The vertical shaft 35 carries a crank pin 39 which periodically engages a Geneva wheel 40, rotatably mounted on a shaft 41 and bolted to a gear wheel 42 also mounted to turn on the shaft 41.

The gear wheel 42 meshes with a gear wheel 43, the hub 44 of which is keyed, by a key 45, to a tubular shaft 46, to the lower end of which is fixed the carrier head 29. Intermittent rotation is therefore imparted to the carrier head 29 to bring the six pairs of grippers 28 carried thereby successively into position above the lifting plunger 25 (Fig. 1).

The vertical shaft 35 carries a cam 47, coacting with a follower 48 on an arm 49 integral with the lower end of a sleeve 150 mounted to turn on a fixed pin 50. Integral with the upper end of the sleeve 150 is an arm 51, pivotally connected, at its end 52, to a rod 53. The rod 53 passes through a hole in an arm 54 fixed to the upper end of a shaft 55 nested within and projecting downwardly from the tubular shaft 46. At its lower end, the shaft 55 carries an arm 56 to which is fixed the first folder 14. A spring 57 is mounted in compression between a collar 58 on the rod 53 and the end of the arm 54. The first folder 14 is therefore driven on its forward stroke, to the position shown in Figs. 2 and 3, through the spring 57, which can yield in the event of obstruction to movement of the folder. An abutment 59 on the rod 53 coacts with the arm 54 to impart a positive return stroke to the folder 14. This, as above stated, moves across beneath the tablet 15 held in the grippers 28 after the lifting plunger 25 has descended sufficiently to permit of movement across its path of the first folder, and thereafter retires to its initial position prior to the next downward stroke of the top plunger 30.

The cam 47 has gear teeth on its outer periphery meshing with a pinion 60 (Fig. 3) on the lower end of a shaft which can be turned by a hand wheel 61 for the purpose of actuating the machine manually.

Also mounted on the vertical shaft 35, immediately below the top gear box 36, is a cam 62, coacting with a follower 63 on an arm 64, mounted on a pin 65 pivoted to a member 66 of the machine framework. The end of the arm 64 is connected by a ball joint 67 to a rod 68. A ball joint 69 connects the other end of the rod 68 to a gripper-actuating cam 70 which is in screw-threaded engagement with a sleeve 71 mounted to rotate on a sleeve 72 which forms a bearing for the lower end of the tubular shaft 46. The sleeve 71 is integral with a worm wheel 73, meshing with a worm 74 on a spindle 75 supported in brackets on the cam 70. By rotating the spindle 75 the cam 70 can be given a vertical adjustment in relation to the sleeve 71.

Each pair of grippers 28 is urged by a spring 77 to the closed position. The left hand gripper 28, as seen in Fig. 2, is supported on an arm 78, pivoted at 79 to the carrier head 29 and carrying a follower 80 coacting with the cam 70. The right hand gripper 28 is supported on an arm 81, pivoted at 82 to the carrier head 29 and carrying a pin 83 engaging a slot 84 in an arm 85 fixed to the arm 78.

The gripper actuating cam 70 is periodically rocked by the cam 62 to bring a high portion opposite the follower 80 of the grippers at the charging station above the brush 9, thereby opening the grippers, and is thereafter rocked back again to allow the spring 77 to close the grippers after a tablet has been lifted through the brush and into position between the grippers.

What I claim as my invention and desire to secure by Letters Patent is:

1. In a wrapping machine, comprising a carrier head mounted to rotate intermittently on a vertical axis, a plurality of pairs of grippers on said carrier head, means at a loading station for lifting in succession into said grippers, as they dwell at the loading station, an article to be wrapped and a wrapper draped around and depending from said article, and a folder at said loading station for folding part of the wrapper against the base of the article held by the grippers dwelling at said loading station, the combination with said carrier head and folder of a gear box disposed above the carrier head, a vertical tubular shaft depending from said gear box, said tubular shaft being connected to and constituting the sole support for the carrier head, mechanism in said gear box for imparting intermittent rotation to said tubular shaft, a spindle housed within said tubular shaft and connected at its lower end to said folder, and means in the gear box for periodically oscillating said spindle to move the folder to and fro in relation to the grippers dwelling at the loading station.

2. In a wrapping machine, comprising a carrier head mounted to rotate intermittently on a vertical axis, a plurality of pairs of grippers on said carrier head, means at a loading station for lifting in succession into said grippers, as they dwell at the loading station, an article to be wrapped and a wrapper draped around and depending from said article, and a folder at said loading station for folding part of the wrapper against the base of the article held by the grippers dwelling at said loading station, the combination with said carrier head and folder of a

gear box disposed above the carrier head, a vertical tubular shaft depending from said gear box, said tubular shaft being connected to and constituting the sole support for the carrier head, a Geneva wheel in said gear box, gearing in the gear box connecting the Geneva wheel to the tubular shaft, a driving shaft in said gear box, a crank pin on said driving shaft coacting with said Geneva wheel to impart intermittent rotation to said tubular shaft, a spindle housed within said tubular shaft and connected at its lower end to said folder, and means in the gear box for periodically oscillating said spindle to move the folder to and fro in relation to the grippers dwelling at the loading station.

3. In a wrapping machine, comprising a carrier head mounted to rotate intermittently on a vertical axis, a plurality of pairs of grippers on said carrier head, means at a loading station for lifting in succession into said grippers, as they dwell at the loading station, an article to be wrapped and a wrapper draped around and depending from said article, and a folder at said loading station for folding part of the wrapper against the base of the article held by the grippers dwelling at said loading station, the combination with said carrier head and folder of a gear box disposed above the carrier head, a vertical tubular shaft depending from said gear box, said tubular shaft being connected to and constituting the sole support for the carrier head, mechanism in said gear box for imparting intermittent rotation to said tubular shaft, a spindle housed within said tubular shaft and connected at its lower end to said folder, a cam in said gear box, a rod in said gear box operatively associated with said cam for reciprocation thereby, an arm on the upper end of said spindle, a spring coupling the rod to the arm and serving periodically to oscillate said spindle in the direction to move said folder into position beneath the grippers dwelling at the loading station and an abutment on the rod for imparting positive return movement to said spindle and folder.

4. In a wrapping machine, comprising a carrier head mounted to rotate intermittently on a vertical axis, a plurality of pairs of grippers on said carrier head, springs on said carrier head for urging each pair of grippers to the closed position, means at a loading station for lifting

in succession into said grippers, as they dwell at the loading station, an article to be wrapped and a wrapper draped around and depending from said article, and a folder at said loading station for folding part of the wrapper against the base of the article held by the grippers dwelling at said loading station, the combination with said carrier head and folder of a gear box disposed above the carrier head, a vertical tubular shaft depending from said gear box, said tubular shaft being connected to and constituting the sole support for the carrier head, mechanism in said gear box for imparting intermittent rotation to said tubular shaft, a spindle housed within said tubular shaft and connected at its lower end to said folder, means in the gear box for periodically oscillating said spindle to move the folder to and fro in relation to the grippers dwelling at the loading station, a gripper actuating cam mounted for rotation on said tubular shaft between said gear box and said carrier head, followers coacting with the cam and connected to the pairs of grippers and mechanism for periodically rocking said cam to and fro to open and close the grippers at the loading station.

5. In a wrapping machine, a combination as claimed in claim 4, comprising a vertical driving shaft for driving said gear box, said vertical shaft being offset laterally from the carrier head, a crank pin on said driving shaft, a Geneva wheel coacting with said crank pin and geared to said tubular shaft, a cam on said driving shaft, a linkage operated by said cam for imparting oscillating movement to said spindle, a further cam on said driving shaft, and a linkage operated by said further cam for imparting oscillating movement in relation to the tubular shaft to said gripper actuating cam.

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