Oct. 11, 1955 L. BROOK 2,720,069

WRAPPING MACHINES

Filed April 29, 1952 4 Sheets-Sheet 1

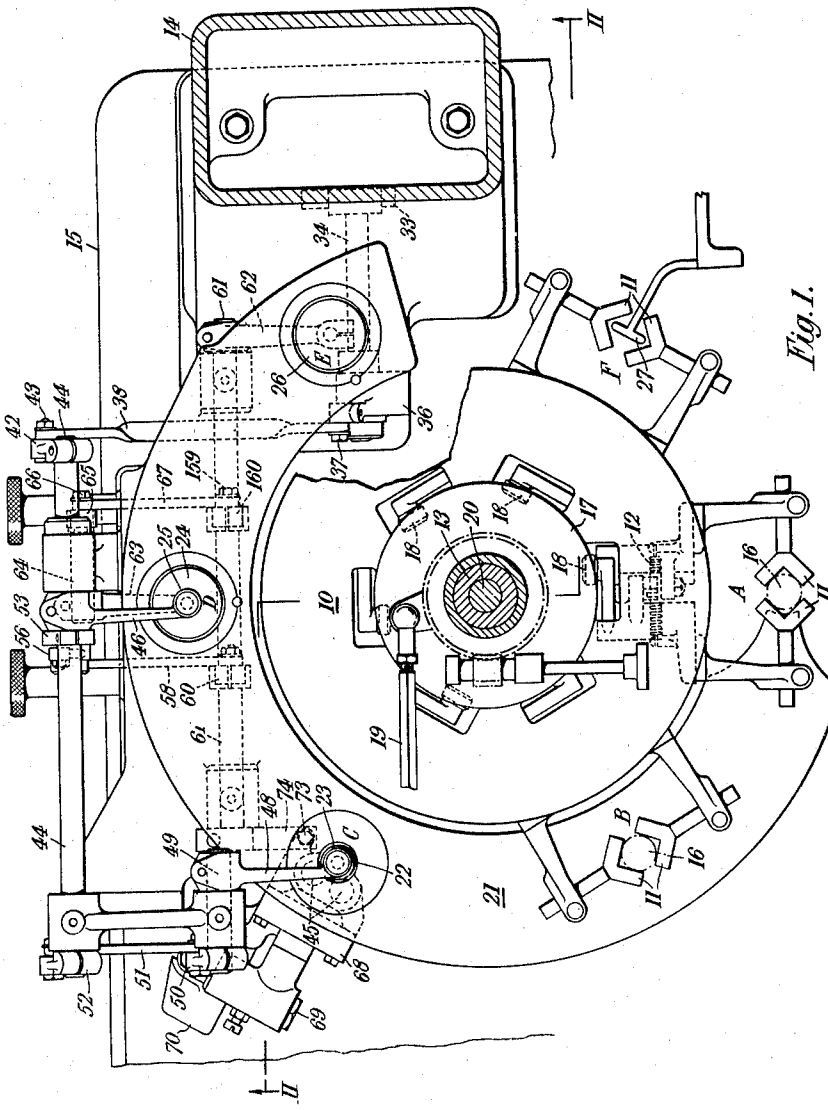


Fig. 1.

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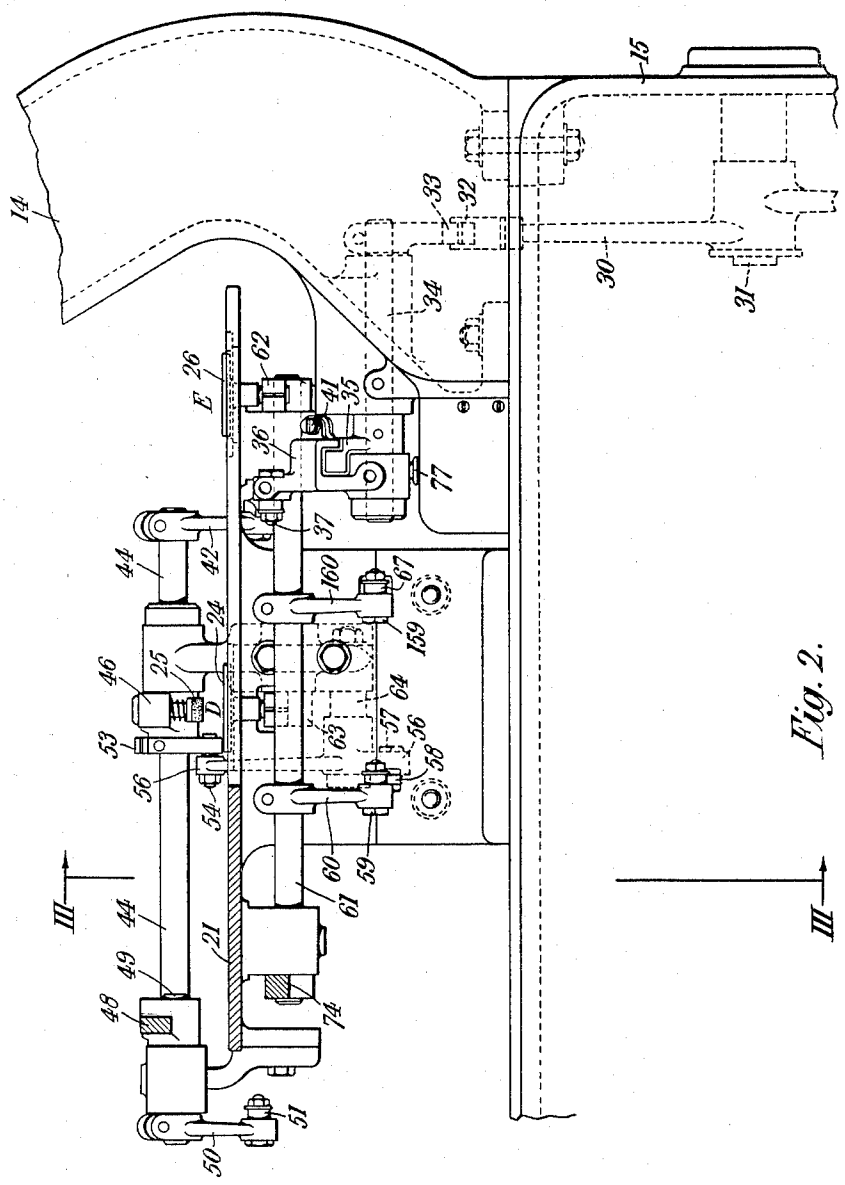


Fig. 2.

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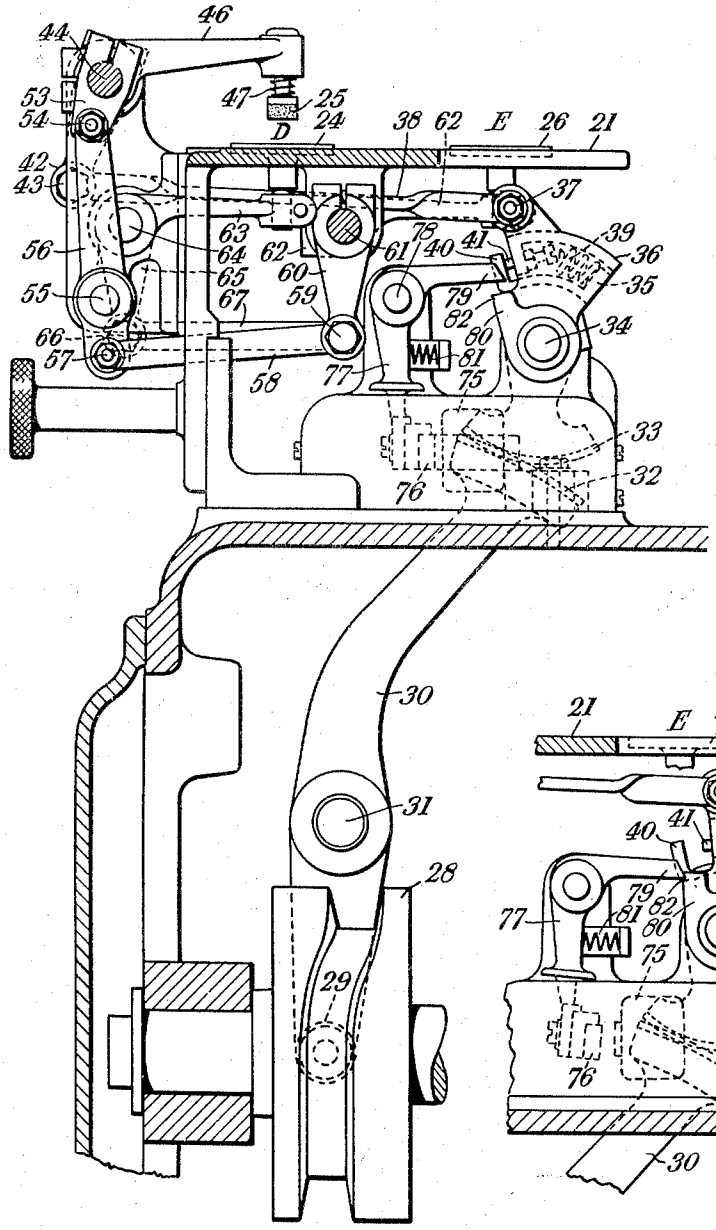


Fig. 3.

Fig. 4.

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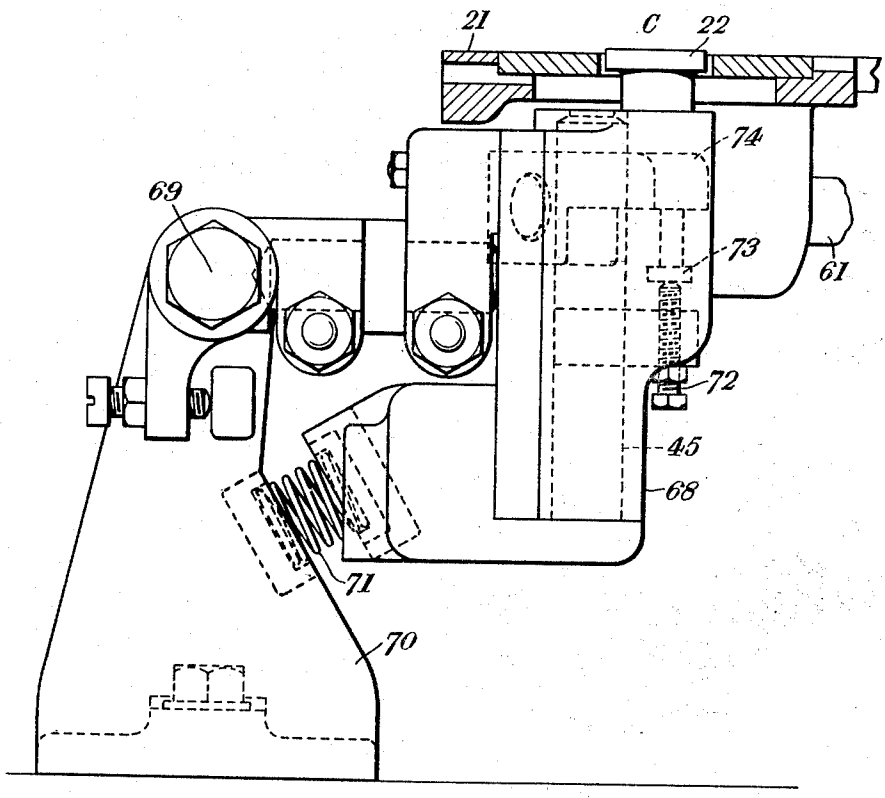


Fig. 5.

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WRAPPING MACHINES

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Application April 29, 1952, Serial No. 284,996

6 Claims. (Cl. 53—126)

This invention relates to bunch wrapping machines of the type in which articles are lifted in succession by a lifting plunger from a feed disc, each carrying a wrapper with it, through a hole, preferably lined with an annular brush, and into grippers carried by an intermittently rotating carrier head. The passage of the article through the hole drapes the wrapper around it in the form of a cup open at its lower end and a first folder operates, after the article has been received by the grippers and the lifting plunger has retired, to fold the downwardly depending wing of wrapper at one side of the article against the base thereof. The carrier head then moves, carrying the article over a fixed folder plate which folds the rest of the depending portion of the wrapper against the base of the article.

It is customary in such machines to use wrappers of waxed paper or other heat sealing material and to provide a heater which is brought into contact with the base of the article to heat seal the pleats of wrapper folded against the base. It is necessary thereafter to cool the heated portions of the wrapper and provision has been made, in a bunch wrapping machine in which the articles are discharged from the carrier head at a station immediately following the sealing station, for a cooling pad to be moved into contact with the base of the article as it is discharged from the carrier head on to a travelling belt located slightly below the carrier head. This is not wholly satisfactory because the pleats of the wrapper have not been cooled sufficiently by the time they arrive at the discharge station to obviate all risk of disturbance of the pleats. Moreover, it is in conflict with the recognised practice that, in wrapping machines required to handle articles of irregular shape, the hold of the carrier head or other grippers on the article should be maintained until wrapping is completed.

According to the invention, wrapping of the articles is completed on the carrier head, which is arranged to move the articles in succession to a heating station and then to a cooling station on their way from the station at which they are loaded into the carrier head to the station at which they are discharged from the carrier head, and the machine includes a heater at the heating station and a cooling pad at the cooling station which are raised simultaneously into contact with the bases of the articles at their respectively stations by mechanism deriving movement from a single cam. Preferably, top pressers, deriving movement from the same cam, are brought into contact with the upper faces of the articles at the heating and cooling stations simultaneously with the movement of the heater and cooling pad against their bases. This ensures effective wrapping and the formation of an effective heat seal.

By completing the wrapping on the carrier head, I ensure that the pleats will have cooled sufficiently by the time the article reaches the discharge station to obviate any risk of disturbance of the pleats during discharge of the article, and I prefer to arrange for the article to be brought by the carrier head to two successive

cooling stations, at each of which a cooling pad is pressed against the base of the article.

One embodiment of bunch wrapping machine for confectionery according to the invention will now be described in detail, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 is a plan view of the carrier head and of the associated heating and cooling mechanism,

Fig. 2 is a section on the line II—II in Fig. 1, but with the carrier head omitted,

Fig. 3 is a section on the line III—III in Fig. 2,

Fig. 4 is a view of part of the mechanism shown in Fig. 3, but with the trip mechanism engaged, and

Fig. 5 is a side view of the heater and associated mechanism.

Like reference characters designate like parts throughout the figures.

The machine is of the construction described in U. S. application Serial No. 283,332, now Patent No. 2,676,441, and comprises a carrier head **10**, carrying six pairs of grippers **11**. The grippers **11** are pivotally mounted on the carrier head and are urged to closed position by springs **12**. The carrier head **10** is suspended, by a tubular shaft **13**, from a top gear box, not shown, but supported by a pillar **14** (Figs. 1 and 2) extending upwardly from the machine frame **15**. A Geneva mechanism in the top gear box imparts intermittent rotation to the tubular shaft **13** to move the grippers **11** successively to stations A, B, C, D, E and F (Fig. 1).

At the loading station A a tablet **16** to be wrapped and a wrapper, of waxed paper or other heat sealing material, are lifted by a cooperating lifting plunger and top plunger through a brush and into the grippers **11** dwelling at station A, this mechanism being described in U. S. application Serial No. 283,332, now Patent No. 2,676,441. The wrapper is thus draped partly around the tablet. A gripper opening cam **17** coacts with followers **18** associated with the grippers **11** and maintains the grippers at station A open while the tablet is being lifted to position between them. The cam **17** is then rocked in relation to the shaft **13**, by a link **19** actuated by a cam, as described in U. S. application Serial No. 283,334, now Patent No. 2,643,500, to cause the grippers to close on the tablet. A shaft **20**, nested within the shaft **17**, is then rocked by another cam to cause a first folder to move across the base of the tablet held by a gripper at station A, to fold a part of the depending wrapper against the base of the tablet. The carrier head **10** then moves to carry the tablet to station B. During this movement the base of the tablet is moved over a fixed folder plate which folds the remaining depending portion of the wrapper against the base. Station B is an idle station, but further rotation of the carrier head **10** brings the tablet in succession to stations C, D and E and finally to a discharge station F. During its passage to stations C, D and E the base of the tablet is traversed along a stationary plate **21**.

At station C, a heater **22** (see also Fig. 5) is lifted against the base of the tablet to heat seal the pleats formed in the wrapper folded against said base, and at the same time a top presser **23** (Fig. 1) is pressed against the top of the tablet. At station D, a cooling pad **24** is lifted against the base of the tablet and a top presser **25** is lowered into contact with its top surface. At station E, a cooling pad **26** is raised into contact with the base of the tablet. The gripper jaws dwelling at stations C, D and E are omitted from Fig. 1 for clarity. When the tablet reaches the discharge station F, the grippers **11** are opened by the cam **17** and a cam operated ejector **27** ejects the wrapped tablet into a discharge chute, not shown. If desired a top presser can be added at the second cooling station E.

Movement is imparted to the heating and cooling mechanisms at stations C, D and E by the mechanism now to be described. This mechanism is shown, in Figs. 1, 2, 3 and 5, in the position which it occupies when the heating and cooling members have been moved to their operative positions.

A cam **28**, Fig. 3, in a bottom gear box, coacts with a follower **29** on a lever **30**, pivotally mounted at **31** and formed at its upper end with gear teeth **32**. The gear teeth **32** mesh with a quadrant **33** fixed to a spindle **34**. Fixed to the spindle **34** is an arm **35**, and loose on the spindle **34** is an arm **36** pivoted, at **37**, to a link **38**. A compression spring **39**, in a curved pocket between the arms **35**, **36**, serves to drive the arm **36** from the arm **35** when the latter is rocked anti-clockwise, to the position shown in Fig. 3. On the return, or clockwise, stroke of the arm **35**, the arm **36** is returned positively by a lug **40** on the arm **35** which coacts with a screw **41** projecting from the arm **36**. The link **38** serves, as later described, to actuate the heating and cooling mechanism, and the spring **39** drives the link **38** in the direction to move the heater **22** towards the article at the heating station C and can yield in the event of obstruction to movement of the heater **22** or other parts operated by the link **38**.

The link **38** is connected by a pin **43** to an arm **42** fixed to a shaft **44**. To the shaft **44** is fixed an arm **46** carrying the top presser **25** at the first cooling station D, a spring **47** being disposed between the top presser **25** and the arm **46**. Movement of the link **38** to the left as seen in Fig. 3, rocks the shaft **44** clockwise to lower the top presser **25** to the position shown.

The top presser **23** at the heating station C (Fig. 1) is carried by an arm **48** fixed to a spindle **49**, carrying an arm **50** (see also Fig. 2) connected, by a link **51**, to an arm **52** fixed to the shaft **44**. When therefore the shaft **44** is rocked clockwise, as seen in Fig. 3, to lower the top presser **25** it also lowers the top presser **23**.

The bottom cooler pads **24**, **26** receive a considerably smaller movement than the top pressers **23**, **25** and this movement is imparted to them through a linkage shown most clearly in Fig. 3. An arm **53** fixed to the shaft **44** is connected by a pin **54** to an arm **56** pivoted at **55** to the machine frame and joined, by a pin **57** to a link **58** coupled, by a pin **59**, to an arm **60** fixed to a shaft **61**. The cooler pad **26** at the second cooling station E is mounted on an arm **62** fixed to the shaft **61**. Clockwise movement of the shaft **44**, as seen in Fig. 3, is thus effective to rock the shaft **61** counter-clockwise and therefore to raise the cooler pad **26** to the position shown in Fig. 3.

The cooler pad **24** at the first cooling station D is carried by an arm **63**, mounted to turn on a centre **64** and fixed to an arm **65** pivoted, by a pin **66**, to a link **67** pivoted at its other end by a pin **159** (Fig. 1) to an arm **160** fixed to the shaft **61**. The cooler pad **24** will therefore move up with the cooler pad **26**.

As shown in Fig. 5, the heater **22** is supported by a bracket **68** containing twin electrically heated cartridges **45** and pivoted by a pin **69** to an upstanding bracket **70** on the machine frame. A spring **71** disposed between the brackets **68**, **70** tends to lift the heater **22** to the position shown in Fig. 5. The bracket **68** carries a screw **72** which coacts with a tappet **73** projecting downwardly from an arm **74** fixed to the end of the shaft **61** (see Fig. 1). When the shaft **61** rocks anti-clockwise, to the position shown in Fig. 3, to raise the cooler pads **24**, **26**, the tappet **73** is lifted, allowing the spring **71** to lift the heater **22** to the operative position shown in Fig. 5. On clockwise movement of the shaft **61** to lower the cooler pads **24**, **26** the tappet **73** depresses the screw **72**, so moving the heater **22** away from the base of the tablet at the heating station C.

The machine includes an electrically controlled trip mechanism, described more fully in U. S. application Serial No. 284,995, now Patent No. 2,639,568, which serves in the event of current being cut off from an electric motor driving the machine, to prevent the arm **36** (Fig. 3) from moving sufficiently to bring the heater **22** into contact with the base of the tablet at the heating station C.

A solenoid **75** is connected in parallel with the motor across the motor supply terminals and its armature **76** is connected to a bell crank lever **77** pivotally mounted at **78**. When the machine is running the solenoid is energised and the bell crank **77** is held in a position, shown in Fig. 3, in which a catch piece **79** on its free end is clear of a trip piece **80** fixed to the arm **36**. As soon as the current supply to the motor is interrupted, the solenoid is de-energised and the bell crank **77** is rocked by a spring **81** to the position shown in Fig. 4. The machine will always overrun by at least one cycle after the stop button has been pressed, and this will ensure that the catch piece **79** can engage a notch **82** in the trip piece **80**, as shown in Fig. 4, and so prevent the arm **36** from following the movement imparted to the arm **35**. The heater **22** is thus prevented from rising to its operative position.

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

1. In a bunch wrapping machine, the combination with a carrier head mounted to rotate on a vertical axis and carrying a plurality of pairs of grippers for receiving in succession at a loading station articles, each with a wrapper draped around it in the form of a cup open at its lower end, of folding means for folding the dependent pleats of wrapper against the bases of the articles, means for imparting intermittent rotation to said carrier head to bring the wrapped articles in succession to a heating station, a heater at said heating station, a first cooling station, a second cooling station and a discharge station, a pair of cooling pads one located at each cooling station, a pair of top pressers, one located at the heating station and the other at the first cooling station, a cam and mechanism operable by said cam, while said carrier head is dwelling, for simultaneously moving said heater and said cooling pads upwards and said top pressers downwards into contact with the articles at their respective stations and thereafter retracting said heater, said cooling pads and said top pressers from said articles.

2. In a bunch wrapping machine, the combination with a carrier head mounted to rotate on a vertical axis and carrying a plurality of pairs of grippers for receiving in succession at a loading station articles, each with a wrapper draped around it in the form of a cup open at its lower end, of folding means for folding the dependent pleats of wrapper against the bases of the articles, means for imparting intermittent rotation to said carrier head to bring the wrapped articles in succession to a heating station, a cooling station and a discharge station, a heater at the heating station, a cooling pad at the cooling station, a cam, a shaft, a linkage coupling said shaft to said cooling pad, mechanism operable by said cam, while said carrier head is dwelling to rock said shaft to and fro and thereby through said linkage to move said cooling pad into and out of contact with the base of the article at the cooling station, a spring urging said heater into position to contact the base of the article at the heating station, and a tappet on said shaft for normally retaining the heater in inoperative position, said tappet freeing the heater for movement to operative position when said shaft is rocked.

3. In an electrically driven bunch wrapping machine, a combination as claimed in claim 2, comprising a yielding connection for imparting rocking movement to said shaft from said cam, and a normally ineffective electrically controlled trip mechanism arranged, on stoppage of the machine, to intercept said shaft and retain said tappet in position to hold said heater in inoperative position.

4. In a bunch wrapping machine, the combination with a carrier head mounted to rotate on a vertical axis and carrying a plurality of pairs of grippers for receiving

in succession at a loading station articles, each with a wrapper draped around it in the form of a cup open at its lower end, of folding means for folding the dependent pleats of wrapper against the bases of the articles, means for imparting intermittent rotation to said carrier head to bring the wrapped articles in succession to a heating station, a cooling station and a discharge station, a heater at the heating station, a cooling pad at the cooling station, a cam, and mechanism operable by said cam, while said carrier head is dwelling, for moving said heater and cooling pad simultaneously into contact with the bases of the articles at their respective stations and thereafter lowering said heater and cooling pad to inoperative positions, said cam-operated mechanism comprising a pair of arms mounted to turn on a common center, means actuated by the cam for imparting positive rocking movement to one of said arms, an operative connection between the other arm and the heater and cooling pad which is effective on rocking movement of said other arm, to cause movement of the heater and cooling pad to and from operative position, a spring connecting said arms and constituting a driving connection therebetween for moving the heater and cooling pad to operative position and coacting abutments on the arms constituting a driving connection between them for moving the heater and cooling pad to inoperative position.

5. In a bunch wrapping machine, the combination with a carrier head mounted to rotate on a vertical axis and carrying a plurality of pairs of grippers for receiving in succession at a loading station articles, each with a wrapper draped around it in the form of a cup open at its lower end, of folding means for folding the dependent pleats of wrapper against the bases of the articles, means for imparting intermittent rotation to said carrier head to bring the wrapped articles in succession to a heating station, a cooling station and a discharge station, a heater at the heating station, a cooling pad at the cooling station, a pair of top pressers, one located at the heating station and the other located at the cooling station, a cam, and mechanism operable by said cam, while said carrier head is dwelling, for simultaneously moving said heater and said cooling pad upwards and said top pressers downwards into contact with the articles at their respective

stations and thereafter retracting said heater, said cooling pad and said top pressers from said articles, said cam operated mechanism comprising a first shaft, an arm fixed to said shaft carrying the top presser at the cooling station, a further arm on said shaft for imparting movement to the top presser at the heating station, means operable by the cam for rocking said shaft to and fro, a second shaft linked to and arranged to rock with said first shaft, a tappet on said second shaft for normally retaining the heater in inoperative position, said heater being movable by spring action into operative position on rocking of said second shaft, a third shaft linked to and arranged to rock with said second shaft and an arm fixed to said third shaft and carrying the cooling pad.

6. In a bunch wrapping machine, the combination with a carrier head mounted to rotate on a vertical axis and carrying a plurality of pairs of grippers for receiving in succession at a loading station articles, each with a wrapper draped around it in the form of a cup open at its lower end, of folding means for folding the dependent pleats of wrapper against the bases of the articles, means for imparting intermittent rotation to said carrier head to bring the wrapped articles in succession to a heating station, a cooling station and a discharge station, a heater at the heating station, a cooling pad at the cooling station, a pair of unheated top pressers, one located at the heating station and the other located at the cooling station, a cam, and mechanism operable by said cam, while said carrier head is dwelling, for simultaneously moving said heater and said cooling pad upwards and said top pressers downwards into contact with the articles at their respective stations and thereafter retracting said heater, said cooling pad and said top pressers from said articles.

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