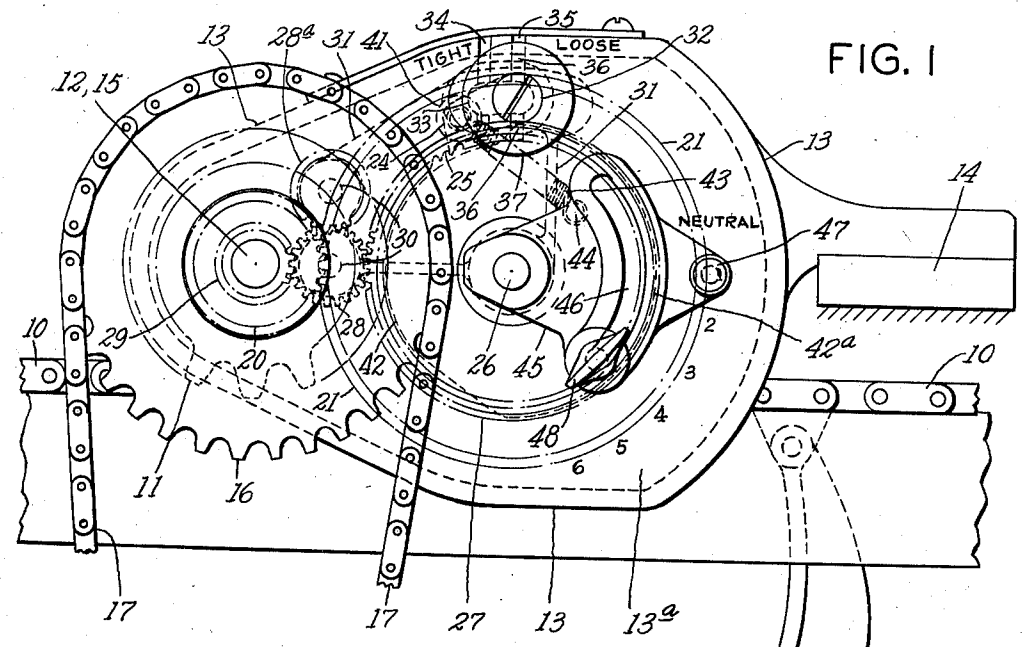
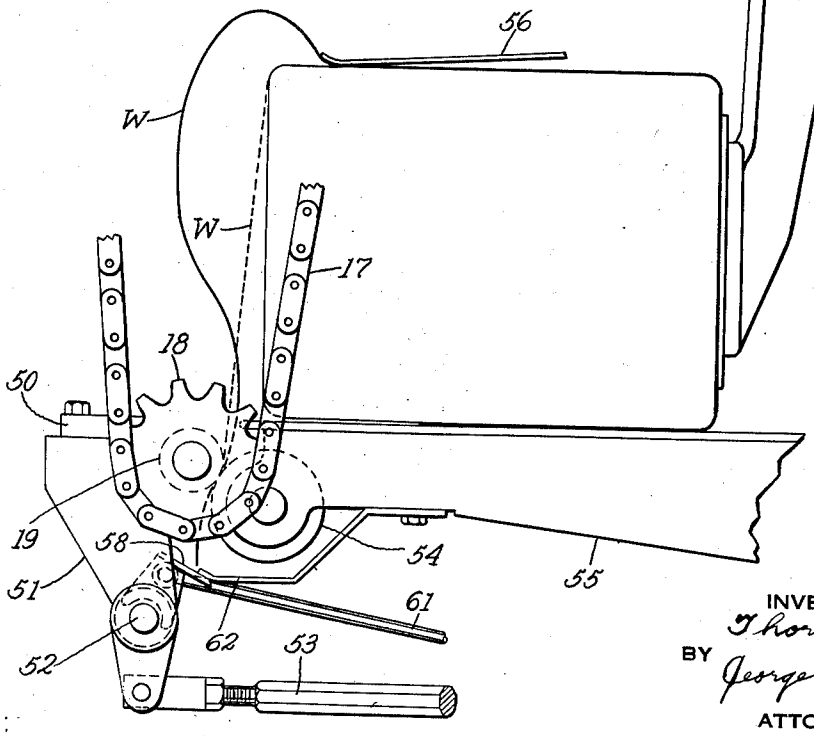
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TIGHT AND LOOSE WRAP

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FIG. 1





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FIG. 2

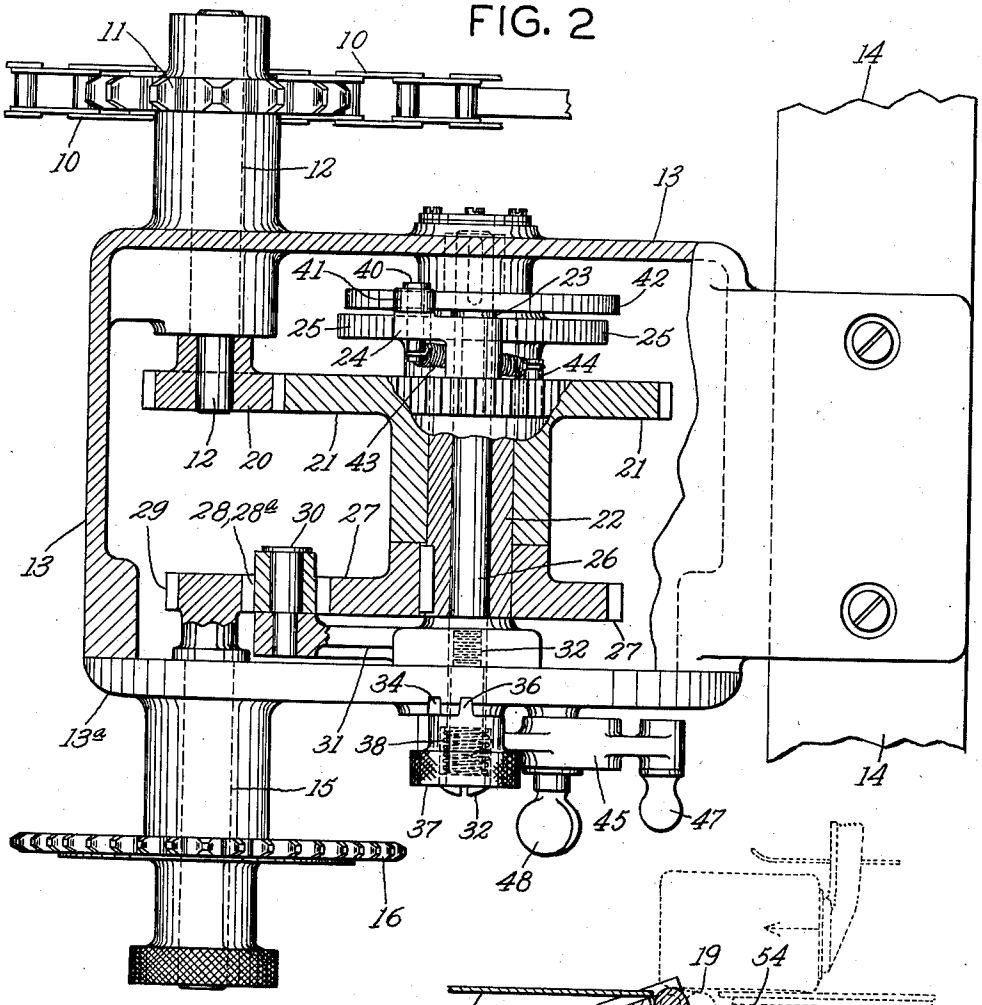
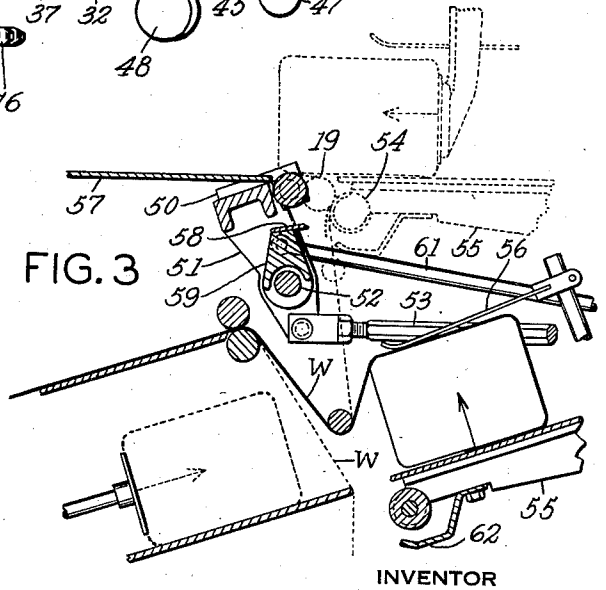


FIG. 3



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TIGHT AND LOOSE WRAP

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19 Claims. (Cl. 271—2.1)

This invention relates to an improvement in wrapping machines, more particularly to an improved device for controlling the feed of the wrapping material, and its main object is to enable the attendant of the machine to regulate the feeding of the wrapping material to such an extent that any degree of tightness or looseness on the finished wrap may be obtained without stopping the machine.

The invention is applicable to wrapping machines of the type in which the article wrapping mechanism operates to pull from a source of supply just enough wrapping material to wrap the article with a moderate tightness, such for instance as the one disclosed in Patent No. 1,626,379 to H. Y. Armstrong, issued April 26, 1927. In such machines the loaf is usually pushed into and thereby enfolded in the leading end of the web of wrapping material, and this movement of the loaf serves to pull off from the roll or other source of supply a sufficient length of material to wrap the article with a moderate tightness. For some purposes a tighter or looser wrap is desired. To this end, in the particular embodiment of the invention selected for illustration herein, there is provided a pair of rolls engaging a portion of the wrapping material trailing the length enfolding the article, and reversible mechanism for intermittently driving one of said rolls in the direction of travel of the wrapping material to pull from the roll a length of wrapping material in addition to that drawn off during the enfoldment of the article and thereby obtain a loose wrap, or counter to the travel of the wrapping material to pull back the slack formed in the length enfolding the article and thus assure a tight wrap. The desired degree of tightness or looseness is obtained by driving the roll for a greater or lesser part of the wrapping machine cycle, and for this purpose the drive is adjustable to stop the rotation of the roll at any desired point in the cycle.

Heretofore continuously driven rolls engaging the wrapping material have been employed to govern the tightness or looseness of the wrap, depending upon their direction of rotation. However, due to their continuous motion they acted during the enfoldment of the article to assist in pulling off the wrapping material from the roll for the production of a loose wrap, or retard the withdrawal of the wrapping material from the roll during enfolding operation and thereby produced tight wrapping. It was found difficult to achieve the desired tightness or looseness of the wrap with this arrangement, because of the differing physical properties of various wrapping materials, and the same material under different temperature conditions. These differences caused variations in the tightness and looseness of the wrap due to the increased or diminished movement of the roll on the wrapping material.

Other devices utilized continuously driven rolls which were mounted on cam-actuated rocking frames and thereby intermittently moved into contact with the wrapping material after the enfoldment of the article therein. Although some of them employed reversible drives to rotate the rolls in either direction for the production of a tight or loose wrap, and where equipped with adjustable connections to the actuating cam designed to permit regulation of the degree of tightness of the wrap, they were unsatisfactory because the adjustment provided could not be effected without stopping the machine. Moreover, the adjustment was a laborious operation which took so long that the consequent loss of production of wrapped loaves was appreciable. With a device constructed according to present invention, however, the necessary adjustments may be accomplished without stopping the machine.

With these and other objects not specifically mentioned in view, the invention consists in certain constructions and combinations hereinafter fully described and then specifically set forth in the claims hereunto appended.

In the accompanying drawings which form a part of this specification and in which like characters of reference indicate the same or like parts:

Fig. 1 is a side elevation of a device embodying the invention, showing the same adjusted to produce a "moderately tight wrapped" package;

Fig. 2 is a plan view partly in cross section showing the drive for changing into different conditions of wrapping; and

Fig. 3 is a detail side elevation showing an article in two different stages during the enfolding operation.

Referring to the drawings, the invention is embodied in a bread wrapping machine of standard construction wherein the continuously traveling endless pusher chain 10 of the wrapping machine runs over a sprocket 11 fast to the shaft 12 journaled in a bearing on one side wall of the gear housing 13. The latter is suspended from the cross bar 14 carried by the side frames (not shown) of the wrapping machine. In the bearing on the other side wall of gear housing 13 is a shaft 15 on the outer end of which is

mounted a sprocket 16 over which runs a chain 17 which drives sprocket 18 on the feed roller 19.

A spur gear 20 attached to the inner end of shaft 12 drives a spur gear 21 which is free to revolve on a sleeve 22. Gear 21 is provided with a stud 23 on which is pivotally mounted a cam actuated pawl 24 which intermittently drives a ratchet wheel 25 keyed on the sleeve 22. Sleeve 22 is loosely mounted on the shaft 26 and on its inner end is fastened a gear 27 which meshes with an intermediate gear 28 which is normally in mesh with gear 29 which is part of shaft 15. When the gearing is meshed in this manner the sprocket 16 will drive the feed roller 19 in a direction to effect loose wrapping of the loaf, as will be presently described. Gears 28 and 28*a* are mounted on studs 30 supported in a quadrant 31 pivotally mounted on shaft 26. In the upper portion of quadrant 26 is fixed a stud 32 which projects through and is guided in an elongated slot 33 provided in the gear housing cover 13*a*. When the gear 28 which is constantly in mesh with a gear 28*a*, is swung downward the latter is meshed with gear 29, while the gear 28 is moved out of engagement therewith; whereby gear 27 drives gear 28 which in turn drives gear 28*a* which is now in mesh with gear 29, and thus driving the sprocket 16 in the opposite direction to effect tight wrapping of the loaf, as will be presently described.

The upper central portion of cover 13*a* has two vertical slots 34 and 35 which are each adapted to receive the projection 36 of the knurled knob 37. The hub of knob 37 is counterbored to admit the head of the stud 32, and a compression spring 38 seated against the stud head maintains the projection 36 in engagement with either of the slots 34 or 35 depending in which position the knob may be set, to obtain tight or loose wrapping respectively. In Fig. 1 the knob is seen set in slot 35 which permits the gear train to drive the feed roller 19 to effect loose wrapping of the loaf. When said knob is pulled outward against the tension of spring 38 and its projection 36 is slipped into slot 34, the quadrant 31 being swung downward about its pivot and the feed roller is then driven in the opposite direction to effect tight wrapping of the loaf.

The pawl 24 carries a stud 40 equipped with a cam roller 41 engaging a plate cam 42 fast on shaft 26. A spring 43 stretched between stud 40 and a stud 44 carried by gear 21, tends to hold the cam roller in engagement with the cam. An arm 45 fast on the inner end of shaft 26 is provided with a slot 46 which permits the arm to be moved by means of a knob 47 through the range from neutral to "6" over the dial on the face of cover 13*a*. A thumb screw 48 carried by cover 13*a* engages in the slot 46 and locks the arm 45 in position when it has been set for the type of wrap desired. The movement of arm 45 also adjusts the position of cam 42 relative to the roller 41 on pawl 24 whereby the feed of the wrapping material may be increased or decreased as will be presently described.

Roller 19 is journaled in bearings 50 of oscillating frame 51 which is fulcrumed on rod 52 and periodically actuated by connecting rod 53 operated from a cam or by other suitable means (not shown) to swing the feed roller 19 in and out of position to coact with the idle roller 54 on swinging lifter table 55, as shown in dotted lines in Fig. 3, while the lifter table is in a raised position.

Referring now to Fig. 1 of the drawings, an article, in the present case a loaf of bread, is shown partially enfolded in a wrapper. It may be noted that the loaf is partially enwrapped in the leading end of the web of wrapping material by pushing it from the infeed runway on to the lifter table while the latter is in its lower position, the movement of the loaf serving to fold the web about three sides thereof and pull off the web from the roll of wrapping material (not shown). Since the web is pulled against the resistance of the roll of wrapping material and the web guiding means (not shown), it is drawn quite tightly about the loaf. The web is pressed against the top of the loaf by a spring finger 56 supported on an upright rod of the lifter table 55. As the lifter table swings to its upper position, it pulls off more wrapping material from the roll, leaving the web W in the dotted position shown in Fig. 1. Up to this time the wrapping mechanism has pulled off a length of material just sufficient to wrap the loaf to produce a "moderately tight wrapped" or average wrapped package if the knob 47 of arm 45 is left in the "neutral" position.

When the lifter table is swung into the raised position shown in Fig. 1, the feed roller 19 pinches the wrapping material W against feed roller 54, and if the knob 37 is set in slot 35 the roller 19 will be driven counter-clockwise and thus coact with the roller 54 to feed an additional length of wrapping material for loose wrapping of the article. For any desired degree of loose wrapping of the article the knob 47 is moved through the range indicated by numerals 1 to 6 inclusive, visible on the cover 13*a*. If placed at "6", the high portion 42*a* of cam 42, which holds the pawl 24 disengaged from the ratchet 25, is at its lowest position, thus allowing the pawl to engage said ratchet at its earliest stage whereby the gear train rotates roller 19 and feeds the maximum length of wrapping material. When the knob 47 is moved towards number "1" the cam will be gradually set to hold the pawl out of engagement with the ratchet a greater length of time, thereby decreasing the additional length of wrapping material fed to the article. While the desired additional length of web is being fed by the rollers 19 and 54, the loaf is advanced from the lifter table 55 on to the sealing table 57 by means of a pusher on the traveling chain 10. During this advance the web is cut by a knife 58 carried by blocks 59 loosely mounted on the pivot of frame 51 and actuated by a connecting rod 61 from a cam (not shown) to sever the web upon the ledger plate 62, and the roller 19 is held in contact with the wrapper. As the enfolded article is advanced over the sealing table, this excess material is wiped under its bottom to form the bottom seam, the roller 19 being free to turn in the direction of movement of the wrapping material due to the fact that the pawl 24 is out of engagement with ratchet 25 at this time. Accordingly, no tension is applied to the wrapper during the final stages of the operation of enfolding the loaf in the wrapper, and a "loose wrapped" package will result after the loosely enwrapped loaf is subjected to the usual end folding and sealing operations.

If the knob 37 is moved to slot 34 the mesh of the gear train will be changed and as a result, sprocket 16 and roller 19 will be driven in the opposite direction from the case just described. The slack in wrapping material W indicated in Fig. 1 will then be drawn taut by the coaction of the roller 19 with the roller 54 on lifter table 55, as indicated (by dotted lines) in Figs. 1 and 3; and the final result would be a "tight wrapped" package. If knob 47 is placed at "6", the roller

19 which now rotates in a clockwise direction will commence to turn at its earliest stage, resulting in a very tight wrap of the package. In moving the knob 47 towards "1", the driving of roller 19 will be delayed and a greater length of the wrapping material would pass with no resistance between rollers 19 and 54, until roller 19 commences to rotate; and in this manner the tightness of the wrapped package can be varied. It may be noted that the roller 19 is free to turn in the direction of movement of the wrapping material until the pawl 24 engages ratchet 25, whereupon the driving of the roller 19 is begun and the slack is drawn to the desired tautness, following which the driving of the roller 19 is interrupted. In practice with various sizes of packages, it will not be necessary to set the knob at the extreme position at "6" for the tightest wraps, as the driving of the roller 19 should be stopped when the slack has been pulled to taut position shown in dotted lines in Fig. 1, which may occur at intermediate positions of the knob for some package sizes.

Should the knob 47 be left at "neutral" position, the portion 42a of cam 42 will hold the pawl and ratchet disengaged, whereby no power will be transmitted to sprocket 16 and as roller 19 would not be rotated in either direction during the feeding period, the wrapping material would pass with no resistance, between rollers 19 and 54 and the result would be a "moderately tight" wrapped or "average wrapped" package. When the knob 47 is at "neutral", the knob 37 can be in either "tight" or "loose" position, as the web W is severed from the reel shortly before the pawl engages the ratchet, thus the turning of roller 19 in either direction would have no effect on the web.

While the invention is illustrated in conjunction with bread wrapping machinery its usefulness is not limited thereto as it may be used with wrapping and packaging machines for various products.

What is claimed is:

1. The combination with means operating intermittently to draw a web of wrapping material from a roll, of a rotatable member engaging said web to feed the same, and mechanism for intermittently driving said member while the operation of said means is interrupted to govern the tautness of the wrapping material, said mechanism being adjustable to vary the driven period of said member and thus regulate the tautness of the web.

2. The combination with mechanism operating to draw a web of wrapping material from a roll, of intermittently moving means operating on the web to control the tautness thereof, said means being reversible, and mechanism coacting with said moving means to vary the extent of its movement in either direction to regulate the tautness of the web.

3. The combination with means operating intermittently to draw a web of wrapping material from a roll, of a rotatable member engag'ng said web to feed the same, mechanism for intermittently driving said member in either direction while the operation of said means is interrupted to regulate the tautness of the web, and a device for varying the driven period of said member.

4. The combination with article wrapping mechanism operating to enfold an article in wrapping material, of moving means operating on the wrapping material to control the tightness thereof about the enfolded article, said means being adjustable and reversible to vary the direction and extent of the movement to impart an increased or diminished tautness to the wrapping material within a given range.

5. In a wrapping machine, the combination with article wrapping mechanism operating to pull from a source of supply of wrapping material a length thereof sufficient to enfold the article, of a feed roller engaging the wrapping material, and means operative to drive said roller either toward the enfolded article or away from the article, said means including a gear train driving said rollers, a pivoted arm carrying one of the intermediate gears of said train, and an idler gear carried by said arm and meshing said intermediate gear, whereby said arm may be swung to bring said intermediate gear out of mesh with its driving gear in said train and mesh said idler gear with said driving gear to reverse the direction of rotation of said roller.

6. In a wrapping machine, the combination with article wrapping mechanism operating to pull from a source of supply a length of wrapping material sufficient to enfold the article, of a pair of feed rollers coacting to feed the wrapping material, means operative to drive one of said rollers away from the enfolded article to produce a tightly wrapped package, and a device for adjusting said means to vary the tightness of the wrap.

7. In a wrapping machine, the combination with article wrapping mechanism operating to pull from a roll a sufficient length of a web of wrapping material to enfold the article, of a pair of feed rollers coacting to feed the web, means operating to intermittently drive one of said rollers either toward the enfolded article to feed an additional length of material, or away from the article to draw the web taut, a device for moving said rollers relatively to grip or release the web, said means being adjustable to regulate the extent of the intermittent movement of the driver roll in either direction to vary the extent of said additional length or the degree of tautness of the web, and a periodically actuated cutter operating to sever the web.

8. In a wrapping machine, the combination with article wrapping mechanism operating to pull from a roll a sufficient length of a web of wrapping material to enfold the article, of a pair of feed rollers coacting to feed the web, means for intermittently driving one of said feed rollers toward the enfolded article to feed an additional length of wrapping material, a device for regulating the extent of the intermittent movement of said driven roll to increase or diminish said additional length, and a cutter for severing the web.

9. The combination with a pair of feed rollers coacting to feed a web of wrapping material, of mechanism for intermittently driving one of said rollers in either direction, and a device for adjusting said means to vary the extent of rotation of the driven roller in either direction.

10. The combination with a pair of feed rollers coacting to feed a web of wrapping material, of mechanism for intermittently driving one of said rollers in either direction, and a device for adjusting said means to vary the extent of rotation of the driven roller in either direction, said device being operative to incapacitate said mechanism.

11. The combination with a pair of feed rollers coacting to feed a web of wrapping material, of

mechanism for intermittently driving one of said rollers in either direction, and a device for adjusting said means to vary the extent of rotation of the driven roller in either direction, said mechanism including a continuously driven rotary member, a ratchet, a driving connection between said ratchet and driven roller, and a pawl carried by said member and normally engaging said ratchet, and said device including a stationary cam having a surface adapted to disengage said pawl from its ratchet, and means for varying the position of said cam to govern the point of disengagement of the pawl from its ratchet and thereby regulate the extent of feeding of the web.

12. The combination with a pair of feed rollers coacting to feed a web of wrapping material, of mechanism for intermittently driving one of said rollers in either direction, and a device for adjusting said means to vary the extent of rotation of the driven roller in either direction, said mechanism including a continuously driven rotary member, a ratchet, a driving connection between said ratchet and driven roller, and a pawl carried by said member and normally engaging said ratchet, and said device including a stationary cam having a surface adapted to disengage said pawl from its ratchet, and means for varying the position of said cam to govern the point of disengagement of the pawl from its ratchet and thereby regulate the extent of feeding of the web, said cam and means being so constructed and arranged that the cam may be set to totally incapacitate said mechanism.

13. The combination with means operating intermittently to draw a web of wrapping material from a roll, of a rotatable member engaging said web to feed the same, and mechanism for intermittently driving said member in either direction while the operation of said means is interrupted, said mechanism being adjustable to vary the driven period of said member and thus to regulate the tautness of said web.

14. The combination with mechanism operating intermittently to draw a web of wrapping material from a roll, of means operating on the web to control the tautness thereof, said means being reversible and adjustable to vary the tautness of the web when operating in either direction.

15. In a wrapping machine, the combination with article wrapping mechanism operating to pull from a source of supply of wrapping material a length thereof sufficient to enfold the article, of a pair of feed rollers coacting to feed the wrapping material, means operative to drive one of said rollers intermittently either toward the enfolded article to feed an additional length of material in order to produce a loosely wrapped package, or away from the article to produce a tightly wrapped package, and a device for adjusting said means, when operating in either direction, to vary the tightness or looseness of the wrap.

16. In a wrapping machine, the combination with article wrapping mechanism operating to pull from a source of supply a length of wrapping material sufficient to enfold the article, of a pair of feed rollers coacting to engage the wrapping material, means operative to drive one of said rollers away from the enfolded article to produce a tightly wrapped package, and a device for adjusting said means, when operating in either direction, to vary the tightness of the wrap.

17. In a wrapping machine, the combination with article wrapping mechanism operating to pull from a source of supply a length of wrapping material sufficient to enfold the article and means acting at a predetermined, substantially constant, rate of speed, to apply said wrapping material of selected length to the article, of a pair of feed rollers coacting to engage the wrapping material, means operative to drive one of said rollers intermittently away from the enfolded article to produce a tightly wrapped package, and a device operative to incapacitate said means.

18. In a wrapping machine, the combination with article wrapping mechanism operating to pull from a roll a sufficient length of a web of wrapping material to enfold the article, of a pair of feed rollers coacting to feed the web, means operating to drive intermittently one of said rollers either toward the enfolded article to feed an additional length of material, or away from the article to draw the web taut, means acting at a predetermined, substantially constant, rate to apply a selected length of wrapping material to the article, irrespective of its tautness, and a periodically actuated cutter operating subsequent to the operation of said feeding means to sever the web.

19. In a wrapping machine, the combination with article wrapping mechanism operating to pull from a roll a sufficient length of a web of wrapping material to enfold the article, of a pair of feed rollers coacting to feed the web, means for intermittently driving one of said feed rollers away from the enfolded article to draw the web taugt, a cutter for severing the web subsequent to the operation of said means, and means acting at a predetermined, substantially constant, rate to apply said severed length of material to the article, irrespective of its tautness.

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