A. E. GRAVES.

WRAPPING MACHINE.

APPLICATION FILED AUG. 2, 1913.

1,095,853.

Patented May 5, 1914.

3 SHEETS—SHEET 1.

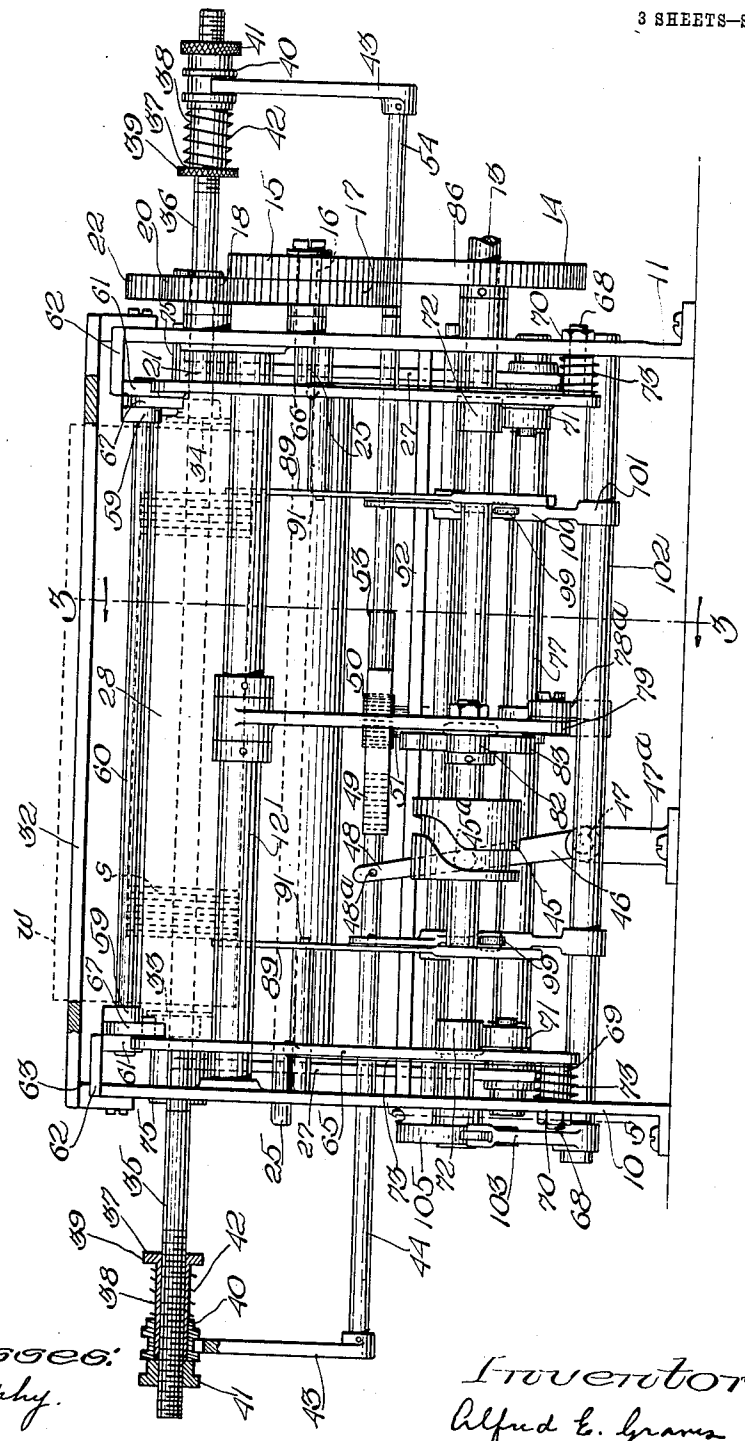


Fig. 1.

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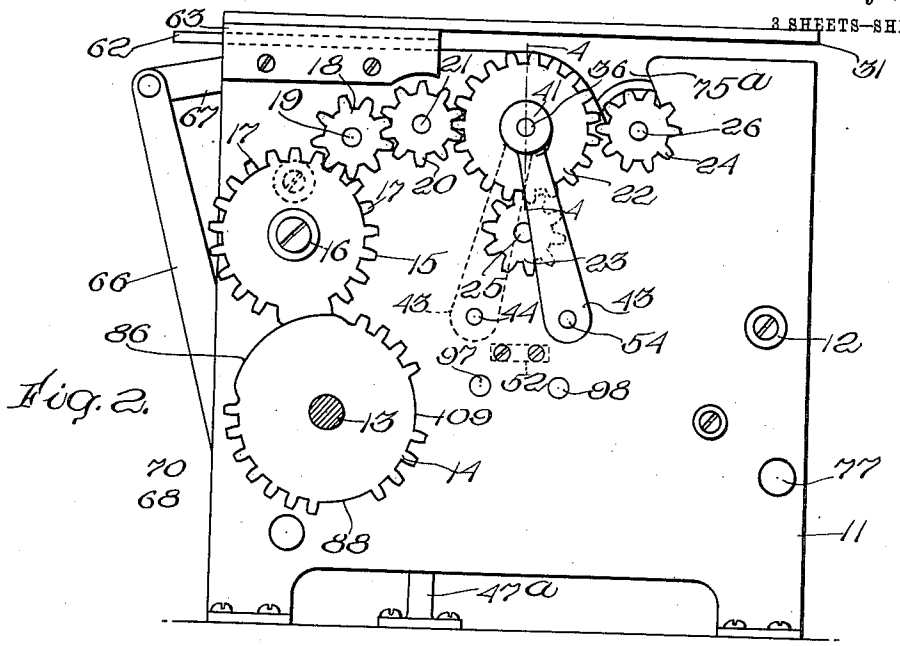


Fig. 2.

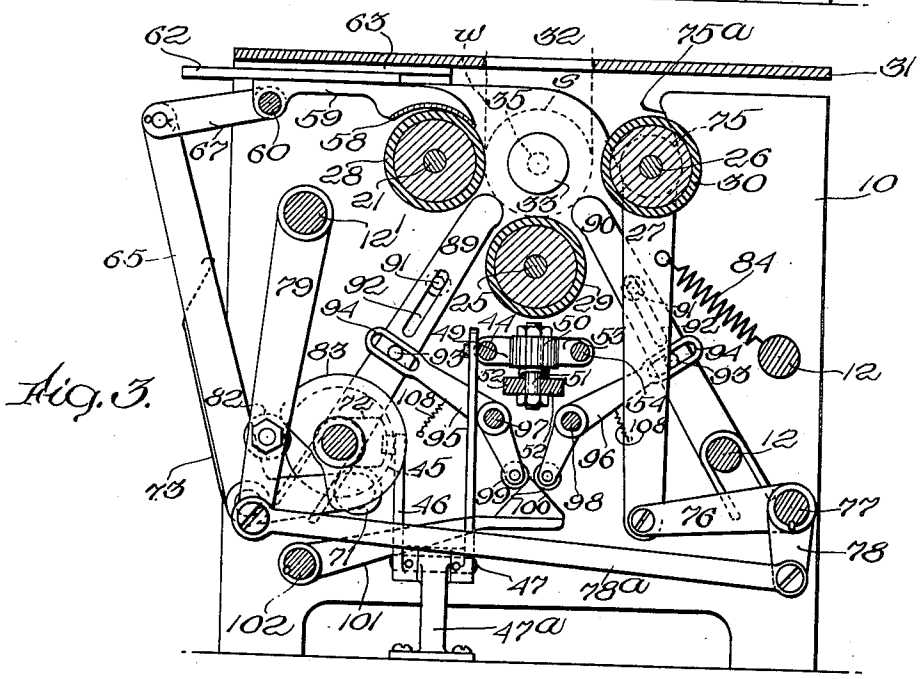


Fig. 3.

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3 SHEETS—SHEET 3.

Fig. 4.

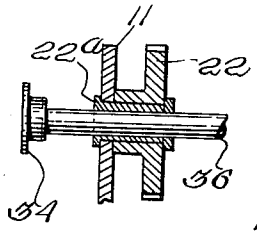
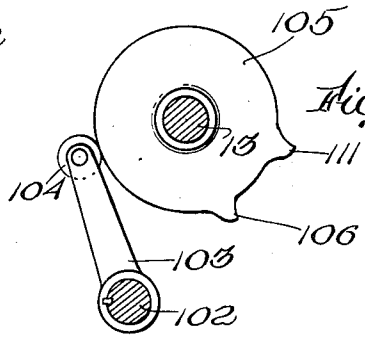


Fig. 5.



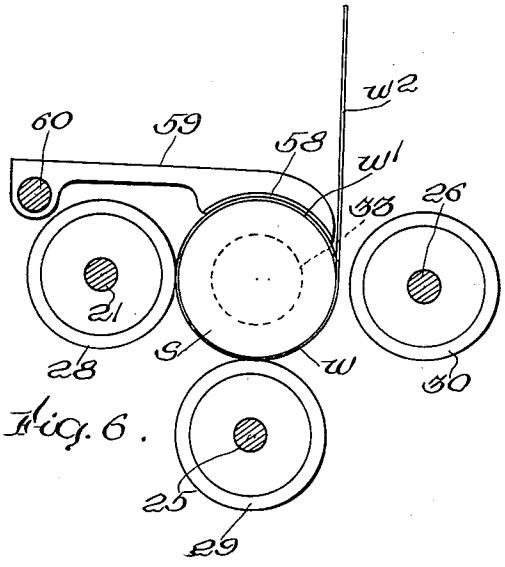


Fig. 6.

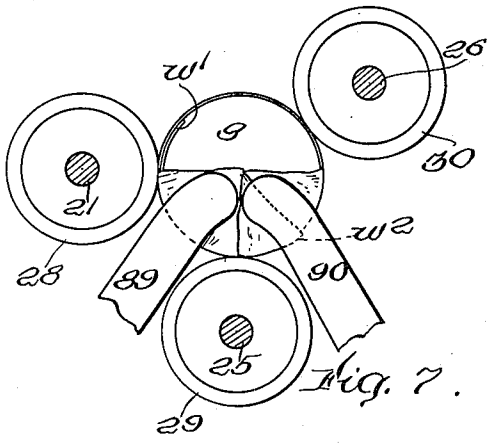


Fig. 7.

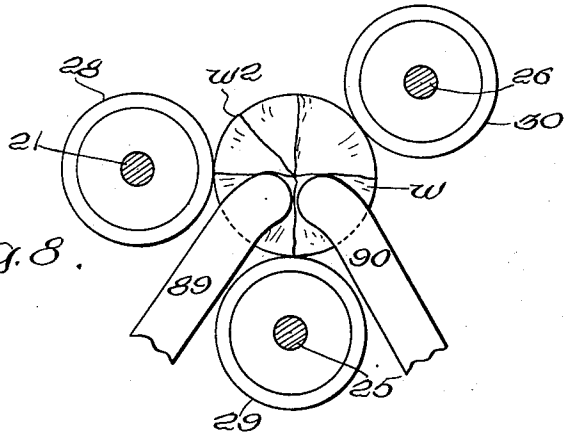


Fig. 8.

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UNITED STATES PATENT OFFICE.

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WRAPPING-MACHINE.

1,095,853. Specification of Letters Patent. Patented May 5, 1914.

Application filed August 2, 1913. Serial No. 782,632.

To all whom it may concern:

Be it known that I, ALFRED E. GRAVES, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Wrapping-Machines, of which the following is a specification, reference being had to the accompanying drawings, forming part thereof.

This invention has reference to improvements in machines for applying wrappers to groups or stacks of sugar or candy wafers, lozenges, of suitable size or other articles of disk form arranged to form a cylindrical package.

One of the objects of this invention is to so construct a wrapping machine that a roll or package of cylindrical form and usually comprising a stack of sugar or candy wafers may be placed in the machine with a wrapper and that said wrapper may be rolled around said package or stack so that the edges of the wrapper may overlap and that the ends of the wrapper which extend beyond the ends of the roll or package may be turned inward against the ends of said roll or package whereby said wrapper is held closed without the use of adhesive.

Other objects of the invention will appear from the following description.

The invention consists in the mechanism for rolling the wrapper around the stack of wafers and in the means for folding in the ends of the wrapper.

The invention also consists in such other novel features of construction and combination of parts as shall hereinafter be more fully described and pointed out in the claims.

Referring to the drawings:—Figure 1, represents a front view in elevation, partly in section, of a machine embodying my invention. Fig. 2, represents an end view in elevation of same. Fig. 3, represents a sectional view taken on the line 3—3 of Fig. 1. Fig. 4, represents a fragmentary sectional view on the line 4—4 of Fig. 2. Fig. 5, represents a sectional view on the line 5—5 of Fig. 1. Figs. 6, 7 and 8 are diagrammatic views illustrating the operation of applying the wrapper to the roll or stack of wafers.

Like reference characters designate corresponding parts throughout.

The frame of the machine consists of two end plates 10 and 11 connected by tie-rods 12 and 12′. Journaled in said end plates is the main shaft 13 which may be driven through any suitable clutch mechanism. Fixed on one end of said main shaft is the gear 14 which intermittently drives the gear 15 journaled on the stud 16 projecting from the end plate 11 of the frame. Also journaled on said stud and fixed to the gear 15, is the gear 17 which drives the pinion 18 journaled on the stud 19 projecting from the end plate 11. Said pinion in turn rotates the pinion 20 fixed on the shaft 21 journaled in the end plates 10 and 11. Rotated by and at the same speed as the pinion 20 through the gear 22 journaled on the bushing 22^a projecting from the end plate 11 (Fig. 4) are the pinions 23 and 24 which are respectively fixed to the shaft 25 journaled in the end plates 10 and 11 and to the shaft 26 journaled in bearings on the upper ends of links 27 near each of its ends. Fixed to the shafts 21, 25 and 26 are rolls 28, 29 and 30, respectively, having their surface preferably coated with rubber or other resilient material.

The stack of wafers and its wrapper may be fed into the machine in any suitable manner, in the drawings is shown the plate or table 31 partly extending over the top of the machine on which is laid the wrapper *w* over the opening 32 in said table. The stack of wafers *s*, with its wrapper, is then passed through said opening and down onto the roll 29. (Fig. 3). Immediately the gripping heads 33 and 34, presently described, which have been moving in toward the center of the machine, clamp the stack by engaging its ends. The gripping heads 33 and 34 have annular faces which are less in diameter than the diameter of a wafer and are fixed to reciprocating rods 35 and 36, respectively. The rod 35 passes through and is guided by an opening in the end plate 10 of the frame and on its end is threaded a nut 37 having a shank 38 and a flange or collar 39. Mounted on the shank 38 is a sliding collar 40 which is pressed outwardly against the nut 41 threaded on the end of the rod 35, by a spring 42 on said shank between said collar and the flange 37. Engaging a groove in the sliding collar 40 is the upper end of the arm 43, the lower end of which is fixed to a reciprocating rod 44. The latter passes through and is guided by an opening in the end plate 10 of the frame and is actuated by the barrel cam 45, fixed on the main shaft

13, through the cam roll 45ª on the upper end of the arm 46 fixed to one end of the short shaft 47 which is journaled in the bracket 47ª and arm 48 fixed on the other end of said short shaft and pivoted at 48ª to the reciprocating rod 44. Fixed to the latter is the rack 49 in mesh with the pinion 50 which is journaled on the stud 51 projecting upwardly from the supporting bar 52 secured at its ends, to the end plates 10 and 11 of the frame. Also in mesh with the pinion 50 is the rack 53 fixed to the reciprocating rod 54. The latter passes through and is guided by openings in the end plates 10 and 11 of the frame. The mechanism connecting one end of the rod 54 with the gripping head 34 is the same as the mechanism hereinbefore described connecting one end of the rod 44 with the gripping head 33. It will be understood that the gripping heads 33 and 34 will operate on the stack simultaneously, that their grip will be cushioned, as the power actuating them is through the springs 42, and their pressure exerted on the stack may be varied as desired by manipulating the nuts 37 and 41.

While the gripping heads 33 and 34 grip the stack, the tucking plate 58, hereinafter described, moves forward and folds the portion w' of the wrapper w over the top of the stack. (Fig. 6.) The tucking plate 58 is secured at its ends to two arms 59 pivoted at their outer ends on the rod 60 which is fixed to ears 61 projecting downwardly from sliding plates 62, 62. The latter are guided by the top of the end plates 10 and 11 of the frame and by the gibs 63 secured to said end plates. Connecting the rod 60 with the elbow levers 65 and 66 are links 67. Said elbow levers are fulcrumed on the studs 68 integral with said levers and extending through sleeves 69 and end plates 10 and 11 and on their ends are threaded nuts 70. The short arms of said elbow levers are provided with cam rolls 71 which engage like cams 72 fixed to the main shaft 13. Said elbow levers are actuated by the springs 73 to sustain the cam rolls 71 in contact with the cams 72. It will be understood that the contours of said cams will control the movement of the tucking plates 58.

At the completion of the forward movement of the tucking plate 58, the roll 30 is moved upwardly, as hereinafter described, and into contact with the wrapper w which as hereinbefore described, has been partially wrapped about its stack of wafers, and the tucking plate 58 and gripping heads 33 and 34 are returned to their normal position. (Fig. 3.) This movement of the roll 30 brings it into a position in relation to the stack to prevent said stack and its wrapper from being crowded out of contact with the rolls 28 and 29. The movement of the roll 30 may be accomplished by the following mechanism:—The upper ends of the links 27 in which the shaft 26 is journaled have projecting bosses 75 which extend through and are guided by cam slots 75ª at the top of the end plates 10 and 11. The lower ends of said links are pivoted on the ends of arms 76 projecting from the rock shaft 77. The ends of said rock shaft are journaled in the end plates 10 and 11 of the frame and on it is fixed the arm 78 which is connected to the arm 79 pivoted on the tie rod 12′, by the link 78ª. Said arm 79 is provided with a cam roll 82 which is continually engaged by the cam 83 fixed on the main shaft 13. The rotation of said cam will intermittently raise the roll 30 through its connecting mechanism and said roll will normally be held down and out of contact with the stack of wafers by the action of the springs 84 fixed at one end to the links 27 and their other end fixed to the tie rod 12. During the foregoing operations the main shaft 13 has partially rotated but the rolls 28, 29 and 30 have remained stationary. This is due to the lack of teeth on the portion 86 of the gear 14. At the completion of said upward movement of the roll 30, the teeth of the gear 14 mesh with the teeth of the gear 15 thereby rotating the latter gear which in turn rotates the rolls 28, 29 and 30 through the gearing hereinbefore described. The rotation of said rolls will by friction cause the stack of wafers to rotate which will fold the portion w^2 of the wrapper around the stack. When the edge of the portion w^2 of said wrapper reaches or approximately reaches the position indicated in Fig. 7, said rolls and stack come to rest, due to the lack of teeth on the portion 88 of the gear 14. The lower portions of both ends of the wrapper are then folded against the end wafers of the stack by the fingers 89 and 90. The upper ends of said fingers are suitably shaped to do the folding and their lower ends are forked to straddle and be guided by the main shaft 13 and one of the tie rods 12, respectively. The upper portions of said fingers are guided by studs 91 projecting from the end plates 10 and 11 of the frame and extending into slots 92 in said fingers. Each of the latter is further provided with pins 93 which engage slots 94 in the upper ends of levers 95 and 96, respectively. The latter are respectively fulcrumed on rods 97 and 98 supported by the frame of the machine. Each of the lower arms of said lever is provided with a roll 99 which is adapted to be engaged by the V shaped cam surfaces 100 formed on the ends of the arms 101, fixed to the rock shaft 102. The latter extends through and is journaled in the end plates 10 and 11 of the frame and on its end which extends through the end plate 10 is fixed an arm 103. The latter is provided with a roll 104 which is engaged by the cam

105 secured on one end of the main shaft 13. When the projection 106 formed on the cam 105 engages the cam roll 104 the arms 101 will be swung upwardly through the movement of the arm 103 and rock shaft 102 which will force the cam surfaces 100 to spread its respective rolls 99 apart, against the action of the springs 108 fixed at one end to the upper arms of the levers 95 and 96 and at their other end to the frame of the machine. The spreading of the rolls 99 will rock the levers 95 and 96 and the latter in turn will force the fingers 89 and 90, respectively, upwardly, thereby folding the lower end portions of the wrapper as described. When the projection 106 on the cam 105 passes the cam roll the fingers 89 and 90 are brought back to their initial position. Then the gear 14 again meshes with the gear 15 and rotates it until the stack of wafers has been revolved one half a revolution, when the stack of wafers is brought to rest, due to the lack of teeth on the portion 109 of the gear 14. The latter movement of said stack brings the remaining portions of the ends of the wrapper in the path of the fingers 89 and 90. The latter then operate upon the wrapper and complete the wrapping of the stack of wafers. (Fig. 8.) This latter movement of said fingers is caused by the engagement of the projection 111 formed on the cam 105 with the roll 104 through mechanism hereinbefore described. The roll 30 is then moved down and out of contact with the stack of wafers, allowing said stack to be removed.

Having thus described my invention I claim as new and desire to secure by Letters Patent—

1. A wrapping machine of the nature described comprising a table having an opening to receive a cylindrical package and its wrapper, a receiving roll rotatably mounted beneath said opening, wrapper end folding devices, a second roll mounted to move in a path between said table and said receiving roll, and means for driving said rolls.

2. A wrapping machine of the nature described comprising a table having an opening to receive a cylindrical package with its wrapper open at the edges, a package receiving and sustaining means located beneath said opening, a roll mounted to move in a path between said table and said sustaining means, means for driving said roll, a tucker operating laterally toward and from said roll, and wrapper end folding devices operating toward and from said opening.

3. A wrapping machine of the nature described comprising a table having an opening to receive a cylindrical package with a wrapper open at its edges and ends, a package receiving and sustaining roll rotatably mounted beneath said opening, a side roll journaled in fixed bearings above and to one side of said receiving roll, a holder roll mounted to move above said receiving roll, a tucker operating above said side roll, means for effecting intermittent operation of certain of said rolls to partially rotate the package to carry the lapped edges to a point between said sustaining roll and said holding roll, and wrapper end folding devices operating between said latter two rolls.

4. A wrapping machine of the nature described comprising a lower roll and a side roll rotatably mounted, a second side roll having a movable carrier adapted to move its roll inward to prevent the upward movement of a package sustained on said lower roll, end folders mounted to slide between said rolls, and means for intermittently operating said rolls and said folders.

5. A wrapping machine of the nature described comprising a frame having end plates, a pair of rolls having shafts journaled in said end plates, a third roll, movable carrier mechanism in which said third roll is carried, means for intermittently rotating one of said rolls, wrapper end folding blades slidably mounted on members of said end plates, and means for intermittently operating said folding blades.

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