Nov. 25, 1924. 1,517,059

F. GROVER

MACHINE FOR AUTOMATICALLY FOLDING WRAPPERS AROUND RECTANGULAR AND OTHER BODIES

Filed April 12, 1924 2 Sheets-Sheet 1

Fig. 1.

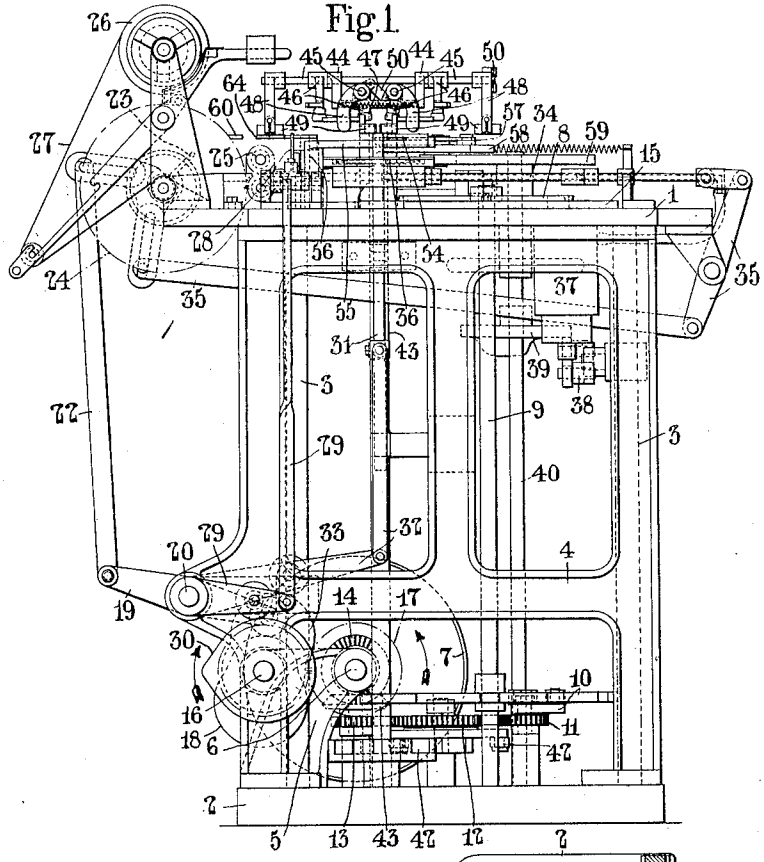
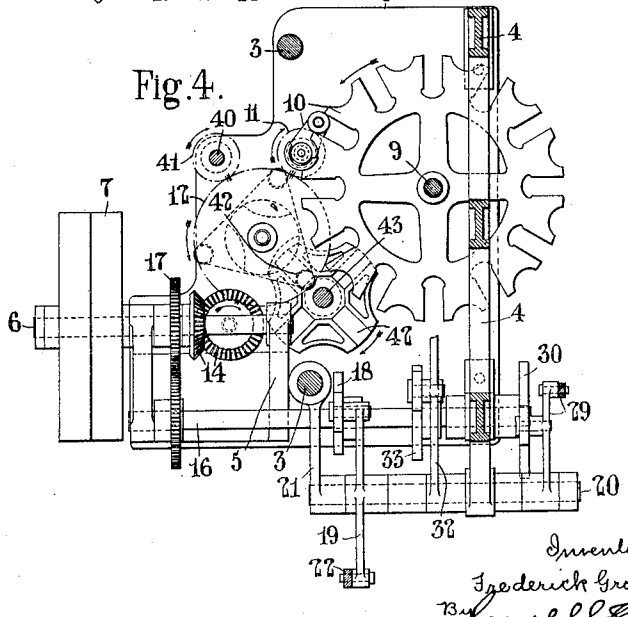


Fig. 4.



Inventor
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Fig. 2.

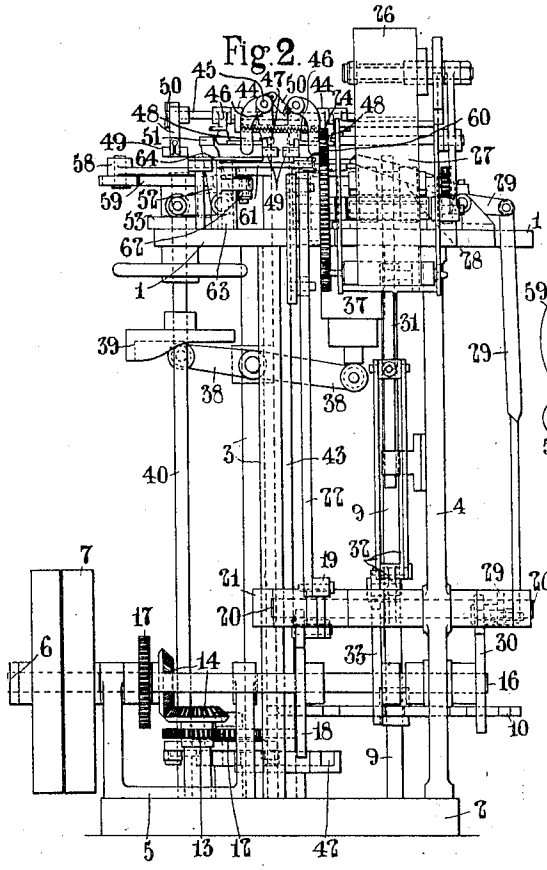


Fig. 3.

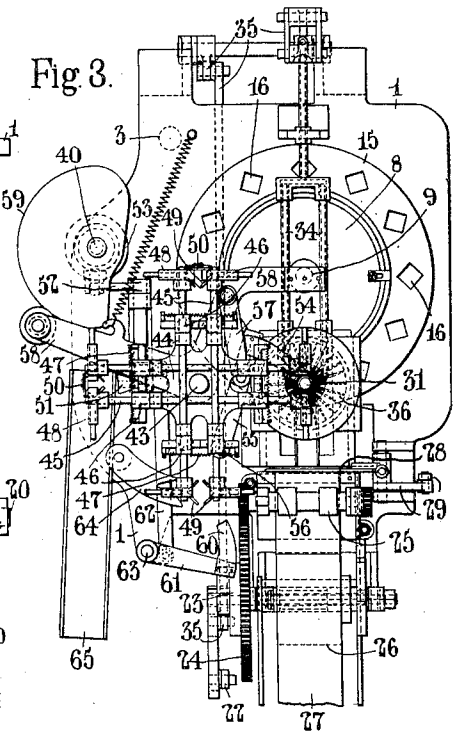


Fig. 8.

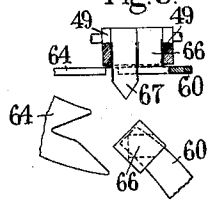


Fig. 7.

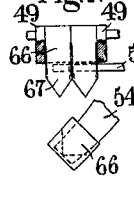


Fig. 6.

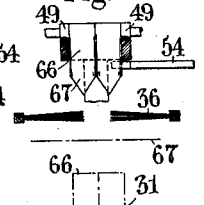


Fig. 9.

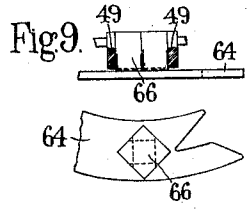
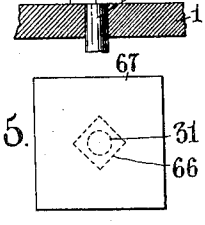


Fig. 5.



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By Sewell & Son
their attorneys.

Patented Nov. 25, 1924. 1,517,059

UNITED STATES PATENT OFFICE.

FREDERICK GROVER, OF LEEDS, ENGLAND, ASSIGNOR TO THE FORGROVE MACHINERY COMPANY LIMITED, OF LEEDS, YORK, ENGLAND.

MACHINE FOR AUTOMATICALLY FOLDING WRAPPERS AROUND RECTANGULAR AND OTHER BODIES.

Application filed April 12, 1924. Serial No. 706,000.

To all whom it may concern:

Be it known that I, FREDERICK GROVER, a British subject, residing at Leeds, in the county of York, England, have invented certain new and useful Improvements in Machines for Automatically Folding Wrappers Around Rectangular and Other Bodies, of which the following is a specification.

This invention relates to machines for automatically folding wrappers composed say of tin foil around rectangular and other bodies such for instance as chocolates, of the kind wherein the bodies to be wrapped are fed forward in turn by a step-by-step rotated disc on to the top of a vertically reciprocating plunger, and in which each body so fed and its wrapper, previously cut off from a continuous strip and brought to above said body by reciprocating device, are pushed upwardly by means of said plunger through a dilatable aperture of a fixed member to lay down the overhanging portions of the wrapper against the sides of the body and bring the partially wrapped body into the embrace of a superposed gripper device, the now depending portions of the wrapper being then tucked under the gripper held body.

In this type of machine as hitherto constructed, all the depending portions of the wrapper have been tucked under the body while the latter is being held above the vertically reciprocating plunger by the gripper device, the completely wrapped body being then removed from the latter by a second upward movement of the vertically reciprocating plunger prior to it descending to bring up the next body to be wrapped; and the object of this present invention is to provide an improved wrapping machine, as hereinafter described, the arrangement being such as to enable the wrapping of more than one body at a time to be carried on with a view to obtaining a materially increased output within a given time.

According to this invention the machine comprises in combination, an intermittently reciprocated plunger, means for feeding the bodies in turn on to the top of said plunger when in the down position, means for feeding the wrappers in turn to above each body so fed, a fixed member having a dilatable aperture through which each wrapper and its body are carried in turn by the upward movement of the plunger to lay down the overhanging portions of each wrapper against the sides of its body, a shaft intermittently rotated step-by-step to time in with the intermittent reciprocations of the plunger, a series of oppositely situated gripper devices carried at equal distances apart on or about said shaft and adapted in turn to receive a partially wrapped body from the plunger when in the up position and carry it step-by-step through half a revolution and then deliver it, means for opening and closing each oppositely situated pair of gripper devices as they come to rest in turn at the receiving and delivery positions respectively, reciprocating tucker means operated during each rest period of the step-by-step rotated gripper devices to tuck under some of the depending portions of the wrappers of the gripper-held bodies, and stationary means for tucking under the remaining depending portions of the wrappers of the gripper-held bodies as they pass thereover in turn during each step rotation of the gripper devices.

Referring to the accompanying explanatory drawings, wherein the same reference numerals in the different views indicate the same or similar parts:—

Figs. 1, 2, 3 and 4 are respectively a front elevation, a side elevation, a plan view and a sectional plan view, of a wrapping machine constructed in accordance with this invention arranged for the wrapping of rectangular bodies; while Figs. 5, 6, 7, 8 and 9 illustrate successive stages in the wrapping of a rectangular body in its wrapper by the machine shown at Figs. 1 to 4.

Referring to Figs. 1 to 4 of the drawings, 1 is a table supported above a bed-plate 2 through the medium of intermediate pillars 3 and a front frame 4, and the bed-plate 2 is provided with a bracket 5 carrying a main shaft 6 which is driven by a belt pulley 7 in the direction indicated by an arrow (Fig. 1). The table 1 supports a disc 8 mounted on a shaft 9 provided with a Geneva movement 10 driven through spur pinion 11, spur wheel 12, spur pinion 13 and bevel gearing 14 from the main shaft 6, the said disc 8 being provided with a rim 15 formed with through recesses 16 for the reception of the bodies to be wrapped.

Mounted in the bracket 5 and front frame 4 is a shaft 16 driven in the direction indicated by an arrow (Fig. 1) from the main shaft 6 by spur gearing 17, and the said shaft 16 is provided with a cam 18 which, through the medium of a double-ended lever 19 pivoted on a fixed shaft 20 supported by a bracket 21 and the front frame 4, actuates a link 22 of a friction-wheel drive 23 provided with a gear wheel 24 which drives a pair of geared rollers 25 adapted to intermittently feed forward from a reel 26 a strip of wrapping material 27 to a knife 28 which is intermittently actuated so as to cut-off a wrapper through the medium of a lever-and-link mechanism 29 operated by a cam 30 situated on the shaft 16. 31 is a plunger which is reciprocated vertically through the medium of lever-and-link mechanism 32 actuated by a cam 33 situated on the shaft 16, while the cut-off wrappers are received singly upon a pair of suction tubes 34 which are intermittently reciprocated through the medium of lever-and-link mechanism 35 connected to the friction wheel drive 23 of the wrapper-material feed so as to bring the carried wrapper to a central position above the top of the plunger 31 and beneath a tubular brush 36 fixed over and in central alignment with the plunger 31, the suction being applied to the tubes 34 by a pipe-connected pump 37 operated through the medium of a double-ended lever 38 actuated by a cam 39 situated on a shaft 40 driven by a spur pinion 41 meshed with the spur wheel 12.

The spur wheel 12, through the medium of a Geneva movement 42, drives a shaft 43 whose upper end carries a bracket 44 fitted with four rods 45 arranged in pairs at right-angles to each other and made capable of a rocking movement therein through the medium of attached arms 46 arranged in pairs elastically held together by connecting springs 47, and each pair of rods 45 are provided at their outer or opposite ends with attached arms 48 carrying gripper jaws 49, one pair of arms 48 on each pair of rods being connected by a link 50, while 51 is a wedge adapted at times through the medium of a pivoted-lever mechanism 52 and a cam 53 situated on the shaft 40, to enter between the adjacent arms 46 of the rods 45 and force them apart against the action of their spring 47 so as to rock the rods 45 in their bracket 44 and open the two opposite sets of gripper jaws 49 simultaneously.

54 is a tucker blade carried on an arm 55 pivoted at 56 to the table 1 and attached by a link 57 to one arm of a bell-crank lever 58 pivoted on the shaft 43 and operated by a cam 59 situated on the shaft 40, and 60 is a second tucker blade carried on an arm 61 attached by a link 62 to the other arm of the bell-crank lever 58 and pivoted at 63 to the table 1, while 64 is a stationary tucking member and 65 (Fig. 3) is a delivery chute.

In action the machine works as follows:—

The bodies to be wrapped are passed into the recesses 16 in the rim 15 of the step-by-step rotated disc 8 by which each body 66 is brought in turn to above and comes to rest on the top of the plunger 31, while a wrapper 67, previously cut-off from the continuous strip 27 by the knife 28 and received by the suction tubes 34, is brought by said suction tubes 34 to a central position above the body 66 and plunger 31 and to beneath the tubular brush 36 (see Fig. 5 and the lower portion of Fig. 6). The body 66 is now carried upward by the plunger 31 so as to free the superposed wrapper 67 from the suction tubes 34 and cause the body 66 and its wrapper 67 to pass through the tubular brush 36 which lays down the overhanging portions of the wrapper 67 against the sides of the body 66, the continued upward movement of the plunger 31 then bringing the now partially wrapped body 66 in between the superposed gripper jaws 49 which are momentarily open to receive it and which then close upon the partially wrapped body 66 (see the upper portion of Fig. 6). The plunger 31 now descends to the level of the table 1 ready to receive the subsequent body, when the tucker 54 (see particularly Figs. 3 and 6) is rocked on its pivot 56 through the medium of its arm 55, link 57, bell-crank lever 58 and cam 59 so as to tuck one of the rear depending corner portions of the wrapper 67 under the gripper-held body 66 (see Fig. 7). The tucker 54 now recedes, when the gripper-held body 66 is moved horizontally through a quarter of a revolution by the step rotation of the shaft 43 through the medium of its geared Geneva movement 42, and when at rest in this second position the second tucker 60 (Fig. 3) is rocked on its pivot 63 through the medium of its arm 61, link 62, bell-crank lever 58 and cam 59 so as to tuck the other rear depending corner portion of the wrapper 67 under the gripper-held body 66 (see Fig. 8). The tucker 60 now recedes, when the gripper-held body 66 is moved horizontally through a further quarter of a revolution by the step rotation of the shaft 43 through the medium of its geared Geneva movement 42, and during such further quarter revolution the said gripper-held body 66 is caused to travel over the stationary tucking member 64 whose shape is such as to tuck the two front depending corner portions of the wrapper 67 in turn under the gripper-held body 66 so as to completely enclose it (see Fig. 9). This second quarter revolution brings the

completely wrapped and gripper-held body 66 over the delivery chute 65, whereupon the wedge 51 is rocked through the medium of its pivoted-lever mechanism 52 and cam 53 so as to pass in betwen the adjacent arms 46 of the rods 45 and force them apart against the action of their spring 47, thereby rocking said rods 45 in their brackets 44 and opening the gripper jaws 49 from which the completely wrapped body 66 now falls into said delivery chute 65.

It will now be understood that during each quarter of a revolution of the four sets of gripper jaws 49, the wrapping of a body is completed by its passage over the stationary tucking member 64, the step-by-step rotated disc 8 brings a body on to the top of the plunger 31, and the reciprocating suction tubes 34 bring a cut-off wrapper to a central position above said body over the plunger 31; while during each rest position of the four sets of gripper jaws 49, a completely wrapped body is dropped from the gripper jaws 49 into the delivery chute 65, a partially wrapped body is received by the gripper jaws 49 from the plunger 31, one of the rear depending corner portions of the wrapper of the body just received and the other rear depending corner portion of the wrapper of the body preceding it are simultaneously tucked under their bodies by the tuckers 54 and 60 respectively.

The recessed rim 15 of the step-by-step rotated disc 8 is made interchangeable to suit different bodies to be wrapped, for which purpose also the feed of the wrapper strip 27 and the stroke of the suction tubes 34 are made adjustable so as to deliver wrappers of a suitable size to above the bodies as they are brought in turn on to the top of the plunger 31, while the gripper jaws 49 are made adjustable in the arms 48 to accommodate the different bodies to be wrapped.

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

1. A machine of the type specified for automatically folding wrappers around rectangular and other bodies, comprising in combination, an intermittently reciprocated plunger, means for feeding the bodies in turn on to the top of said plunger when in the down position, means for feeding the wrappers in turn to above each body so fed, a fixed member having a dilatable aperture through which each wrapper and its body are carried in turn by the upward movement of the plunger to lay down the overhanging portions of each wrapper against the sides of its body, a shaft intermittently rotated step-by-step to time in with the intermittent reciprocations of the plunger, a series of oppositely situated gripper devices carried at equal distances apart on or about said shaft and adapted in turn to receive a partially wrapped body from the plunger when in the up position and carry it step-by-step through half a revolution and then deliver it, means for opening and closing each oppositely situated pair of gripper devices as they come to rest in turn at the receiving and delivery positions respectively, reciprocating tucker means operated during each rest period of the step-by-step rotated gripper devices to tuck under some of the depending portions of the wrappers of the gripper-held bodies, and stationary means for tucking under the remaining depending portions of the wrappers of the gripper-held bodies as they pass thereover in turn during each step rotation of the gripper devices.

2. A machine of the type specified for automatically folding wrappers around rectangular and other bodies, comprising in combination, an intermittently reciprocated plunger, a Geneva movement driven disc for feeding the bodies in turn on to the top of said plunger when in the down position, means for feeding the wrappers in turn to above each body so fed, a fixed member having a dilatable aperture through which each wrapper and its body are carried in turn by the upward movement of the plunger to lay down the overhanging portions of each wrapper against the sides of its body, a shaft intermittently rotated step-by-step to time in with the intermittent reciprocations of the plunger, a series of oppositely situated gripper devices carried at equal distances apart on or about said shaft and adapted in turn to receive a partially wrapped body from the plunger when in the up position and carry it step-by-step through half a revolution and then deliver it, means for opening and closing each oppositely situated pair of gripper devices as they come to rest in turn at the receiving and delivery positions respectively, reciprocating tucker means operated during each rest period of the step-by-step rotated gripper devices to tuck under some of the depending portions of the wrappers of the gripper-held bodies, and stationary means for tucking under the remaining depending portions of the wrappers of the gripper-held bodies as they pass thereover in turn during each step rotation of the gripper devices.

3. A machine of the type specified for automatically folding wrappers around rectangular and other bodies, comprising in combination, an intermittently reciprocated plunger, a Geneva movement driven disc for feeding the bodies in turn on to the top of said plunger when in the down position, intermittently reciprocated suction tubes for feeding the wrappers in turn to above each body so fed, a fixed member having a dilatable aperture through which each wrapper and its body are carried in turn by the upward movement of the plunger to lay

down the overhanging portions of each wrapper against the sides of its body, a shaft intermittently rotated step-by-step to time in with the intermittent reciprocations of the plunger, a series of oppositely situated gripper devices carried at equal distances apart on or about said shaft and adapted in turn to receive a partially wrapped body from the plunger when in the up position and carry it step-by-step through half a revolution and then deliver it, means for opening and closing each oppositely situated pair of gripper devices as they come to rest in turn at the receiving and delivery positions respectively, reciprocating tucker means operated during each rest period of the step-by-step rotated gripper devices to tuck under some of the depending portions of the wrappers of the gripper-held bodies, and stationary means for tucking under the remaining depending portions of the wrappers of the gripper-held bodies as they pass thereover in turn during each step rotation of the gripper devices.

4. A machine of the type specified for automatically folding wrappers around rectangular and other bodies, comprising in combination, an intermittently reciprocated plunger, a Geneva movement driven disc for feeding the bodies in turn on to the top of said plunger when in the down position, intermittently reciprocated suction tubes for feeding the wrappers in turn to above each body so fed, a fixed member having a dilatable aperture through which each wrapper and its body are carried in turn by the upward movement of the plunger to lay down the overhanging portions of each wrapper against the sides of its body, a shaft intermittently rotated step-by-step through a geared Geneva movement to time in with the intermittent reciprocations of the plunger, a series of oppositely situated gripper devices carried at equal distances apart on or about said shaft and adapted in turn to receive a partially wrapped body from the plunger when in the up position and carry it step-by-step through half a revolution and then deliver it, means for opening and closing each oppositely situated pair of gripper devices as they come to rest in turn at the receiving and delivery positions respectively, reciprocating tucker means operated during each rest period of the step-by-step rotated gripper devices to tuck under some of the depending portions of the wrappers of the gripper-held bodies, and stationary means for tucking under the remaining depending portions of the wrappers of the gripper-held bodies as they pass thereover in turn during each step rotation of the gripper devices.

5. A machine of the type specified for automatically folding wrappers around rectangular and other bodies, comprising in combination, an intermittently reciprocated plunger, a Geneva movement driven disc for feeding the bodies in turn on to the top of said plunger when in the down position, intermittently reciprocated suction tubes for feeding the wrappers in turn to above each body so fed, a fixed member having a dilatable aperture through which each wrapper and its body are carried in turn by the upward movement of the plunger to lay down the overhanging portions of each wrapper against the sides of its body, a shaft intermittently rotated step-by-step through a geared Geneva movement to time in with the intermittent reciprocations of the plunger, four oppositely situated pairs of spring-connected gripper jaws carried on and arranged at ninety degrees apart about said shaft and adapted in turn to receive a partially wrapped body from the plunger when in the up position and carry it step-by-step through half a revolution and then deliver it, means for opening and closing each oppositely situated pair of gripper devices as they come to rest in turn at the receiving and delivery positions respectively, reciprocating tucker means operated during each rest period of the step-by-step rotated gripper devices to tuck under some of the depending portions of the wrappers of the gripper-held bodies, and stationary means for tucking under the remaining depending portions of the wrappers of the gripper-held bodies as they pass thereover in turn during each step rotation of the gripper devices.

6. A machine of the type specified for automatically folding wrappers around rectangular and other bodies, comprising in combination, an intermittently reciprocated plunger, a Geneva movement driven disc for feeding the bodies in turn on to the top of said plunger when in the down position, intermittently reciprocated suction tubes for feeding the wrappers in turn to above each body so fed, a fixed member having a dilatable aperture through which each wrapper and its body are carried in turn by the upward movement of the plunger to lay down the overhanging portions of each wrapper against the sides of its body, a shaft intermittently rotated step-by-step through a geared Geneva movement to time in with the intermittent reciprocations of the plunger, four oppositely situated pairs of spring-connected gripper jaws carried on and arranged at ninety degrees apart about said shaft and adapted in turn to receive a partially wrapped body from the plunger when in the up position and carry it step-by-step through half a revolution and then deliver it, a cam-operated wedge for opening and closing each oppositely situated pair of gripper devices as they come to rest in turn at the receiving and delivery posi-

tions respectively, reciprocating tucker means operated during each rest period of the step-by-step rotated gripper devices to tuck under some of the depending portions of the wrappers of the gripper-held bodies and stationary means for tucking under the remaining depending portions of the wrappers of the gripper-held bodies as they pass thereover in turn during each step rotation of the gripper devices.

7. A machine of the type specified for automatically folding wrappers around rectangular and other bodies, comprising in combination, an intermittently reciprocated plunger, a Geneva movement driven disc for feeding the bodies in turn on to the top of said plunger when in the down position, intermittently reciprocated suction tubes for feeding the wrappers in turn to above each body so fed, a fixed member having a dilatable aperture through which each wrapper and its body are carried in turn by the upward movement of the plunger to lay down the overhanging portions of each wrapper against the sides of its body, a shaft intermittently rotated step-by-step through a geared Geneva movement to time in with the intermittent reciprocations of the plunger, four oppositely situated pairs of spring-connected gripper jaws carried on and arranged at ninety degrees apart about said shaft and adapted in turn to receive a partially wrapped body from the plunger when in the up position and carry it step-by-step through half a revolution and then deliver it, a cam-operated wedge for opening and closing each oppositely situated pair of gripper devices as they come to rest in turn at the receiving and delivery positions respectively, lever and cam-actuated reciprocating tucker means operated during each rest period of the step-by-step rotated gripper devices to tuck under some of the depending portions of the wrappers of the gripper-held bodies, and stationary means for tucking under the remaining depending portions of the wrappers of the gripper-held bodies as they pass thereover in turn during each step rotation of the gripper devices.

8. A machine of the type specified for automatically folding wrappers around rectangular and other bodies, comprising in combination, an intermittently reciprocated plunger, a Geneva movement driven disc for feeding the bodies in turn on to the top of said plunger when in the down position, intermittently reciprocated suction tubes for feeding the wrappers in turn to above each body so fed, a fixed member having a dilatable aperture through which each wrapper and its body are carried in turn by the upward movement of the plunger to lay down the overhanging portions of each wrapper against the sides of its body, a shaft intermittently rotated step-by-step through a geared Geneva movement to time in with the intermittent reciprocations of the plunger, four oppositely situated pairs of spring-connected gripper jaws carried on and arranged at ninety degrees apart about said shaft and adapted in turn to receive a partially wrapped body from the plunger when in the up position and carry it step-by-step through half a revolution and then deliver it, a cam-operated wedge for opening and closing each oppositely situated pair of gripper devices as they come to rest in turn at the receiving and delivery positions respectively, lever and cam-actuated reciprocating tucker means operated during each rest period of the step-by-step rotated gripper devices to tuck under some of the depending portions of the wrappers of the gripper-held bodies, and a fixed tucking member for tucking under the remaining depending portions of the wrappers of the gripper-held bodies as they pass thereover in turn during each step rotation of the gripper devices.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

FREDERICK GROVER.

Witnesses:
JOHN JOWETT,
CYRIL BELLAMY.