H. ROSE.

PACKAGING MACHINE.

APPLICATION FILED SEPT. 12, 1910.

1,025,882.

Patented May 7, 1912.

19 SHEETS—SHEET 1.

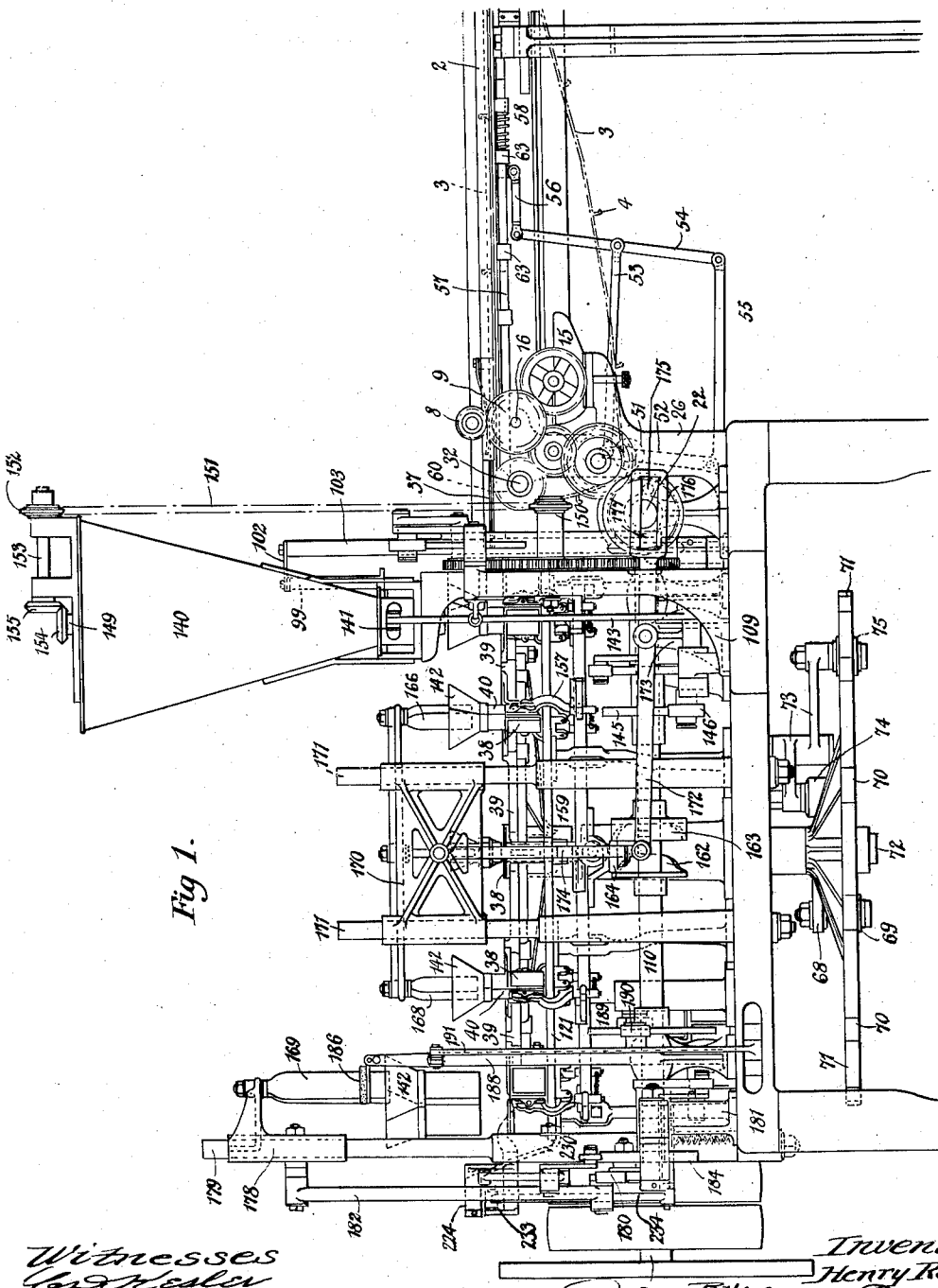

Fig 1.

Witnesses
C. A. Kesler
Robert Everett.

Inventor
Henry Rose
James L. Norris, Jr. Atty

H. ROSE.

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19 SHEETS—SHEET 2.

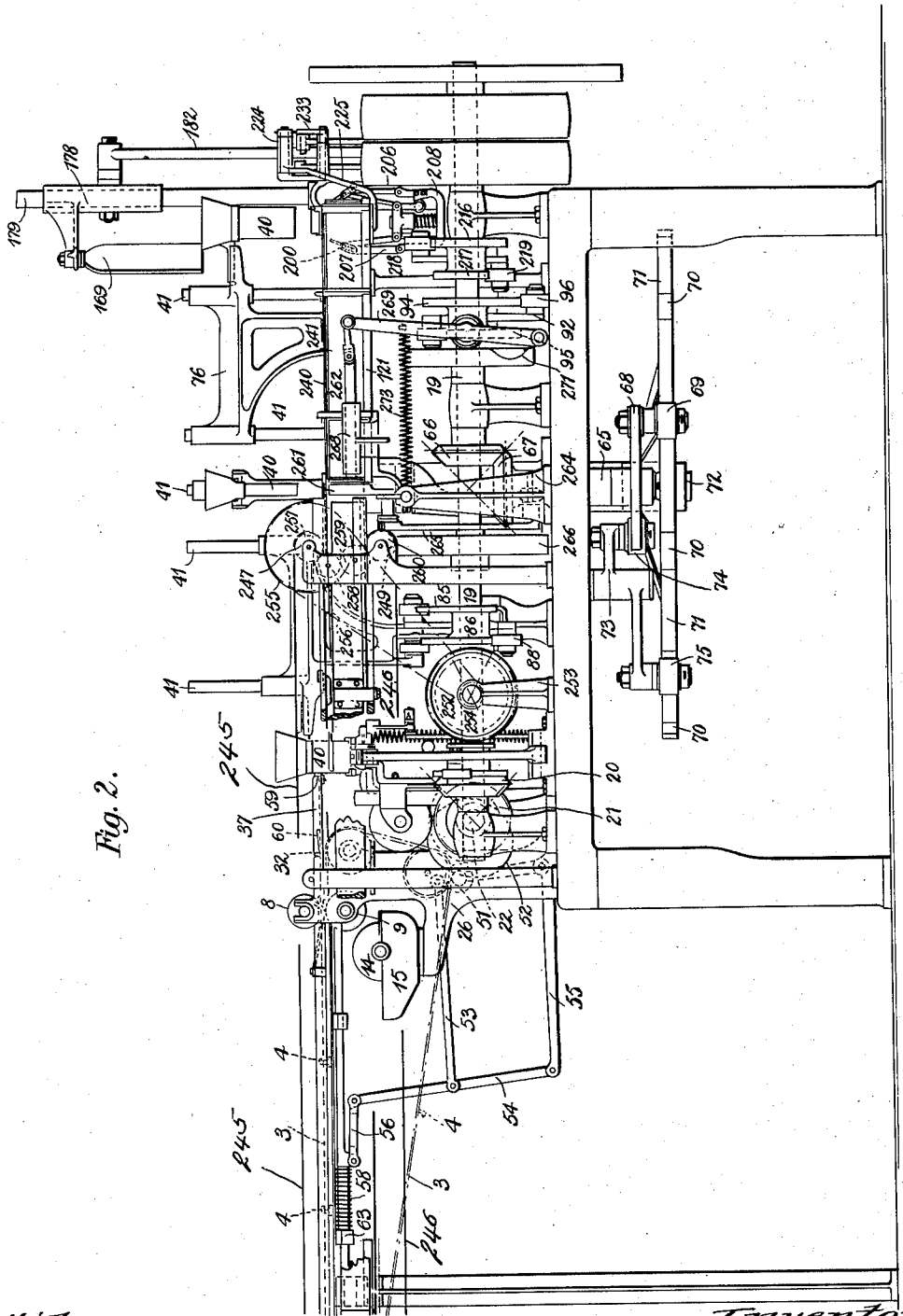

Fig. 2.

Witnesses
Ed. Keeler
Robt. Everitt.

Inventor
Henry Rose
By James L. Norris Pitts

H. ROSE.

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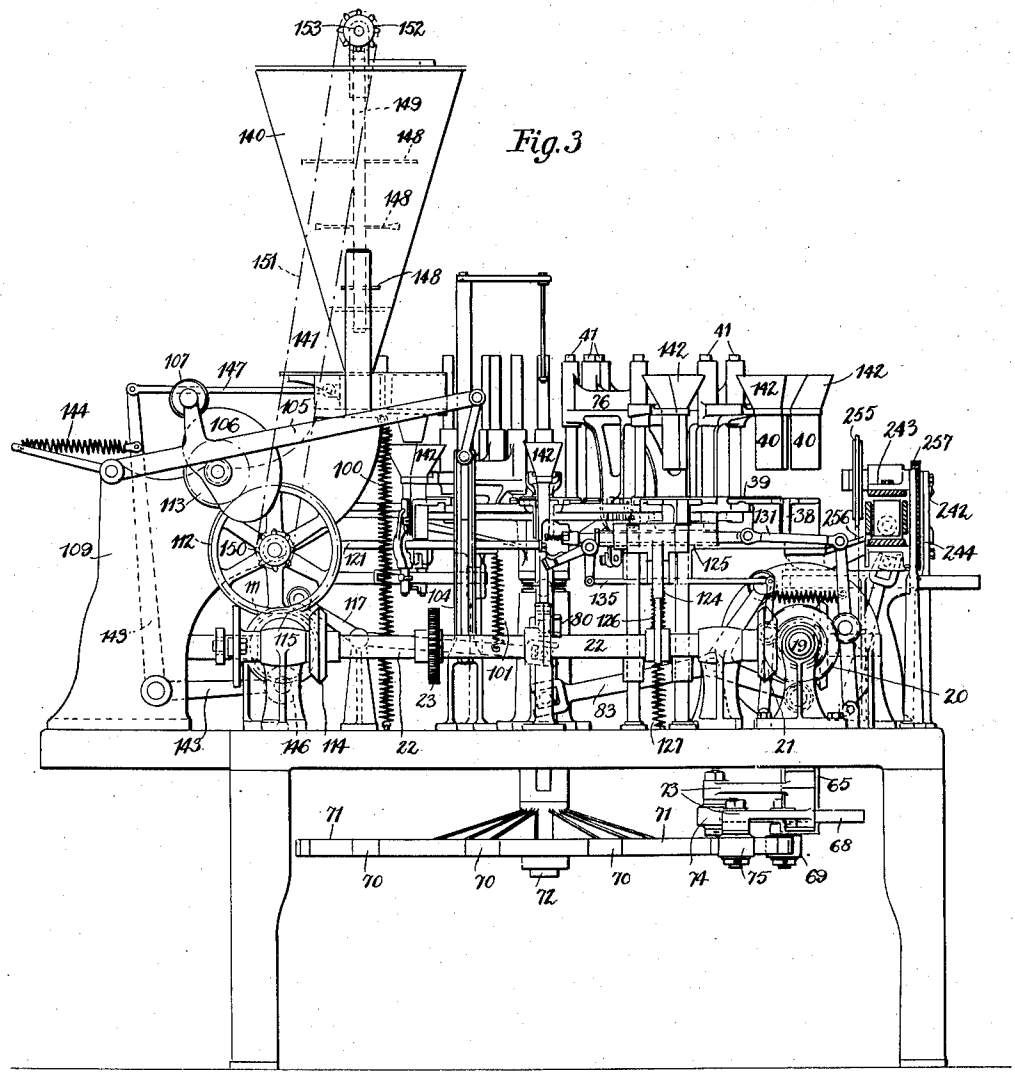
19 SHEETS—SHEET 3.

Fig. 3



Witnesses
C. A. Kesler
Robt Everitt,

Inventor
Henry Rose
By James L. Norris Jr.
Atty

H. ROSE.

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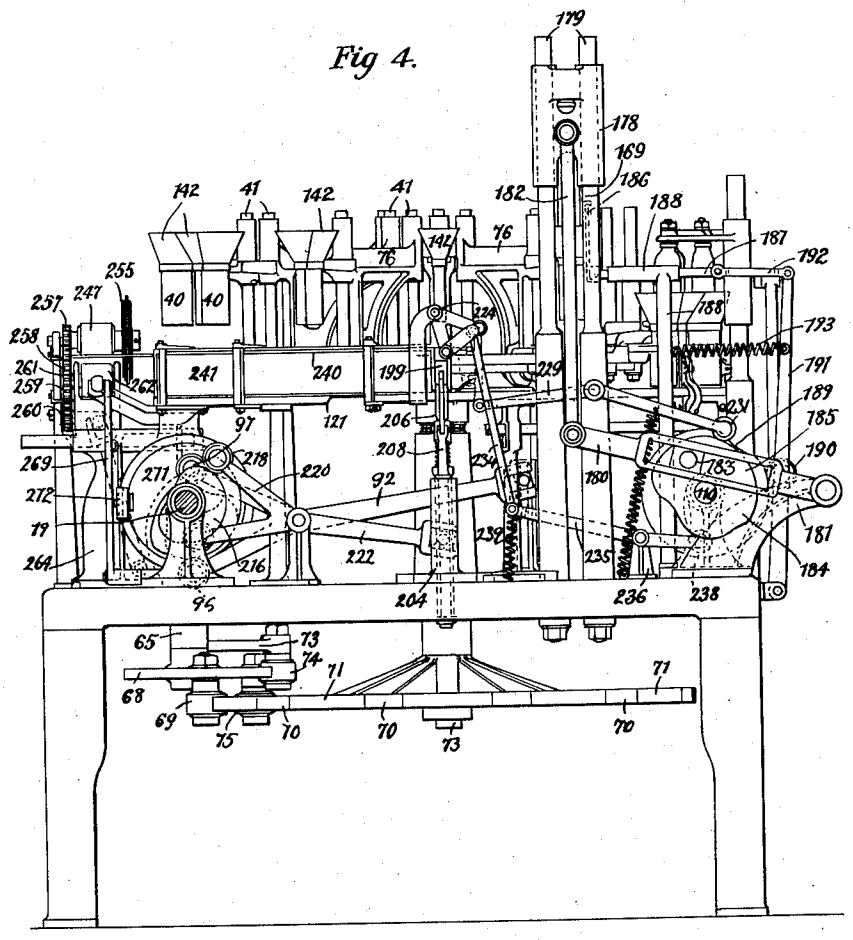
19 SHEETS—SHEET 4.

Fig 4.



Witnesses
C. S. Hosler
Robert Everett.

Inventor
Henry Rose
By
James L. Norris D.
Atty

H. ROSE.

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19 SHEETS—SHEET 5.

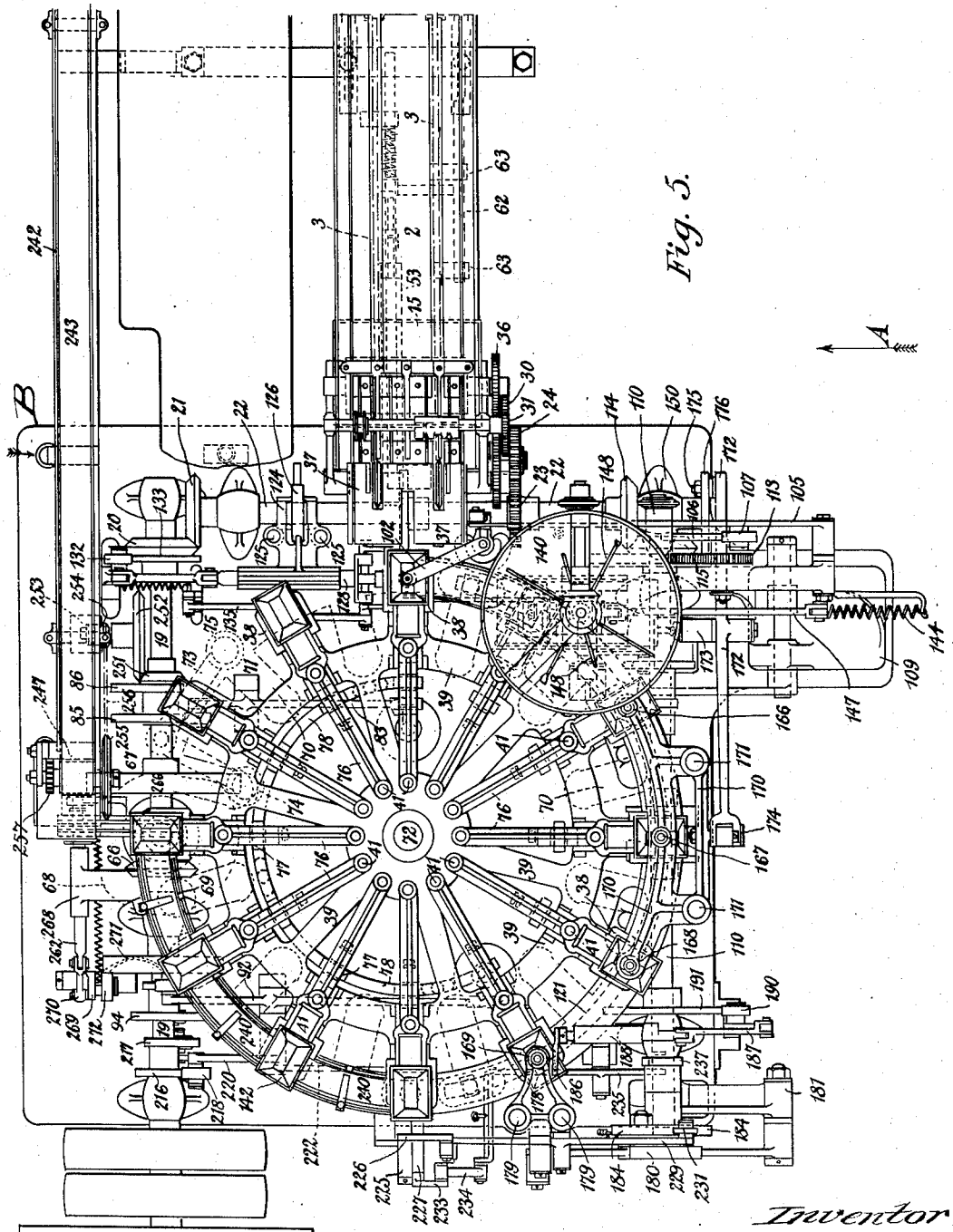

Fig. 5.

Witnesses
C. C. Kesler
Robt. Emmett.

Inventor
Henry Rose
By James L. Norris & Co.
Attys

H. ROSE.

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APPLICATION FILED SEPT. 12, 1910.

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19 SHEETS—SHEET 6.

Fig. 6.

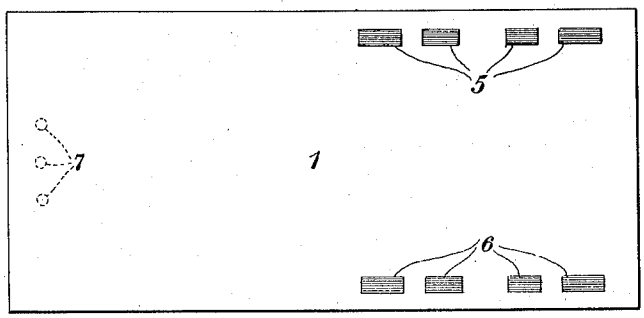


Fig. 7.

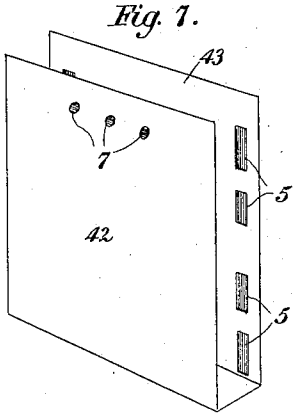


Fig. 8.

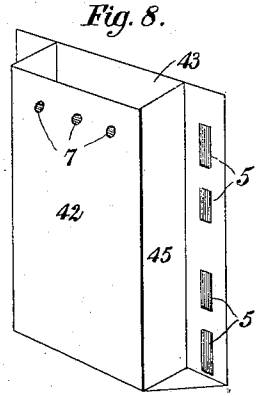


Fig. 9.

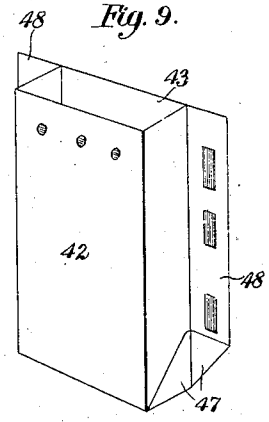


Fig. 10.

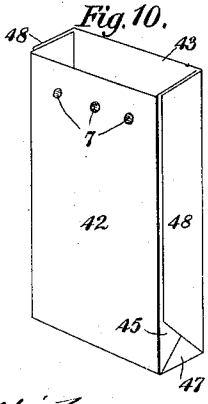


Fig. 11.

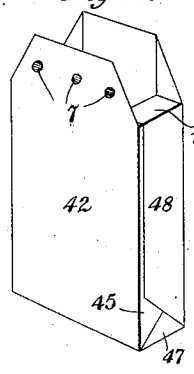


Fig. 12.

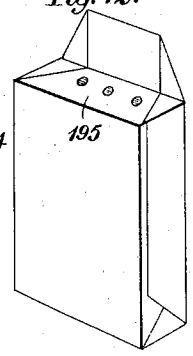
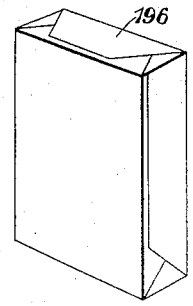


Fig. 13.



Witnesses:

C. E. Kesler

Robert Everett.

Inventor

Henry Rose

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Atty.

H. ROSE.

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Patented May 7, 1912.

19 SHEETS—SHEET 7.

Fig. 14.

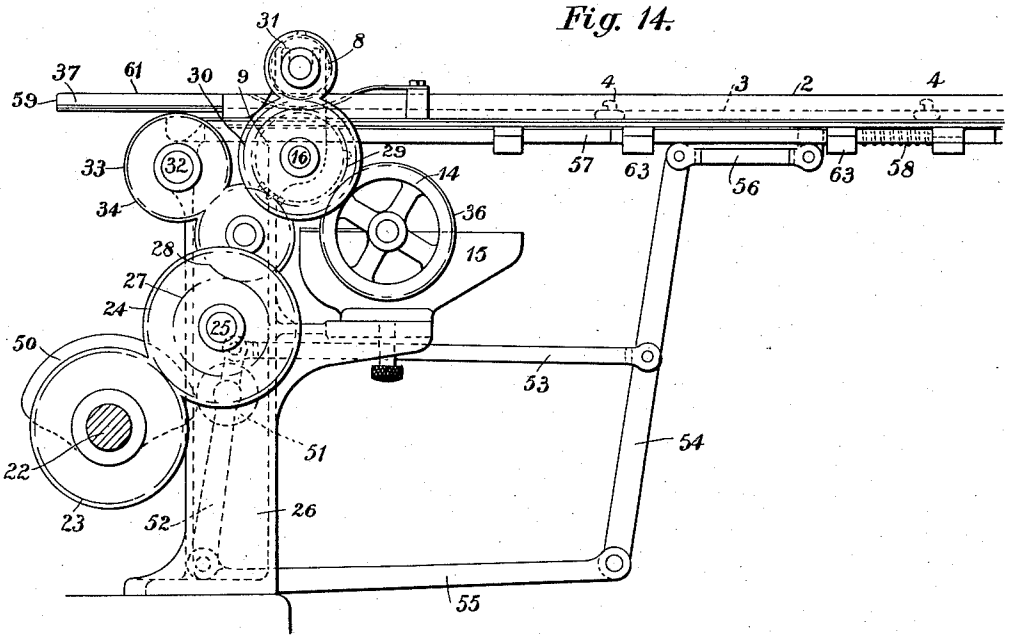
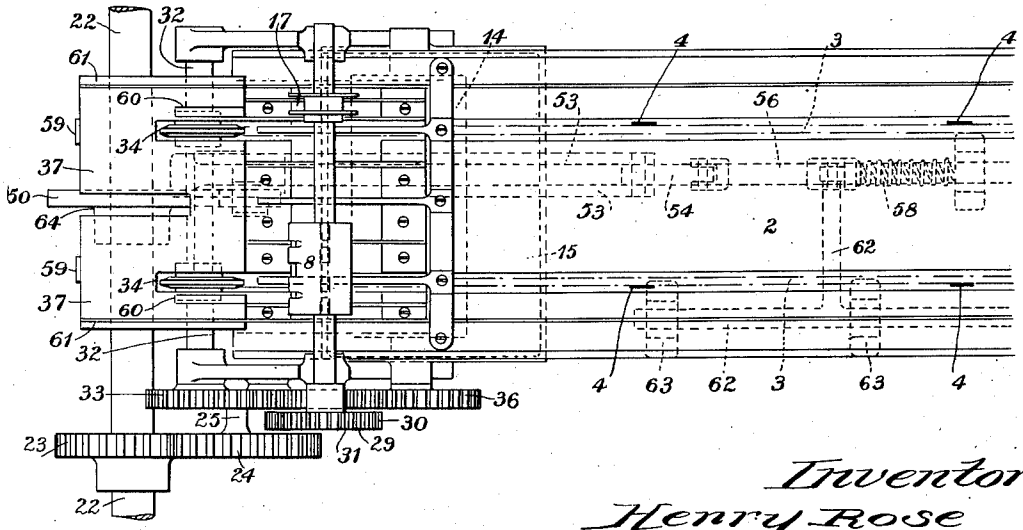


Fig. 15.



Witnesses:

Robt Ewett

Inventor

Henry Rose

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Atty

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APPLICATION FILED SEPT. 12, 1910.

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Patented May 7, 1912.

19 SHEETS—SHEET 8.

Fig. 16.

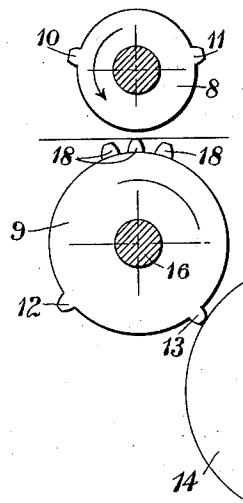


Fig. 17.

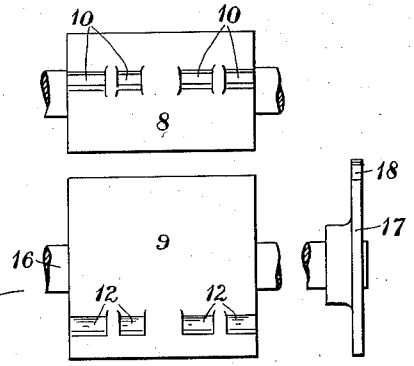
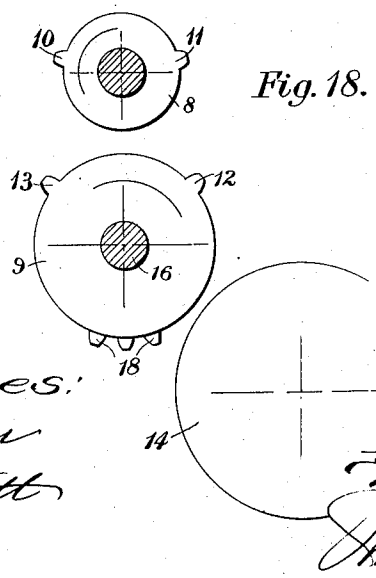


Fig. 18.



Witnesses:

E. Keeler

Robt Smith

Inventor

Henry Rose

By

James L. Norris, Jr.

Atty.

H. ROSE.

PACKAGING MACHINE.

APPLICATION FILED SEPT. 12, 1910.

1,025,882.

Patented May 7, 1912.

19 SHEETS—SHEET 9.

Fig. 19.

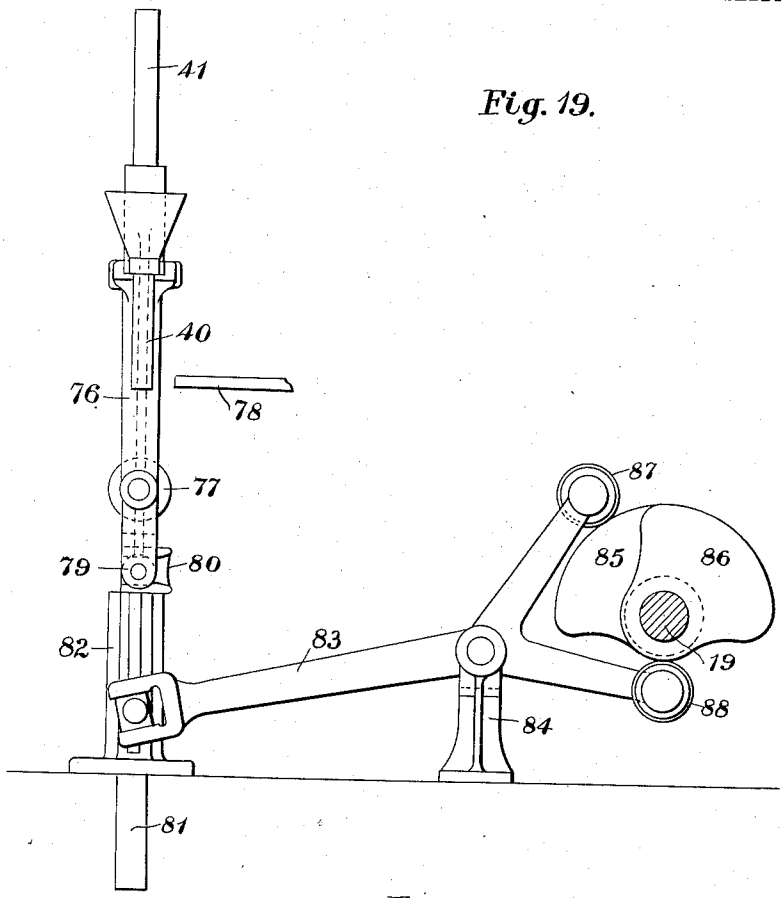
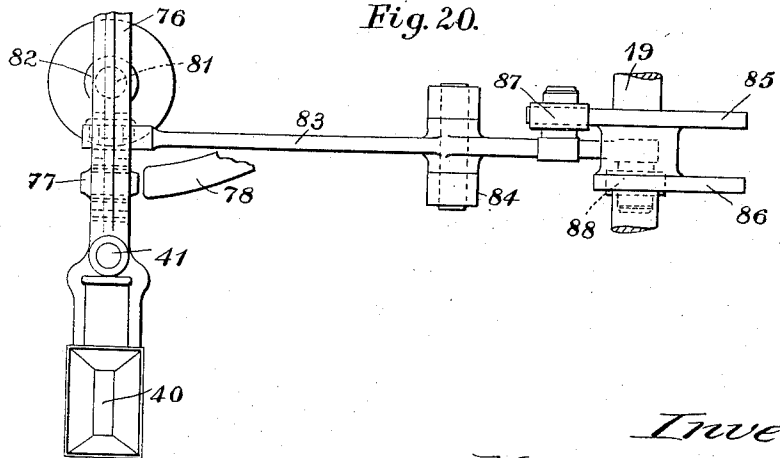


Fig. 20.



Witnesses:
C. Kesler
Robt Everett,

Inventor
Henry Rose
By
James L. Norris D.
Atty

H. ROSE.

PACKAGING MACHINE.

APPLICATION FILED SEPT. 12, 1910.

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19 SHEETS—SHEET 10.

Fig. 21.

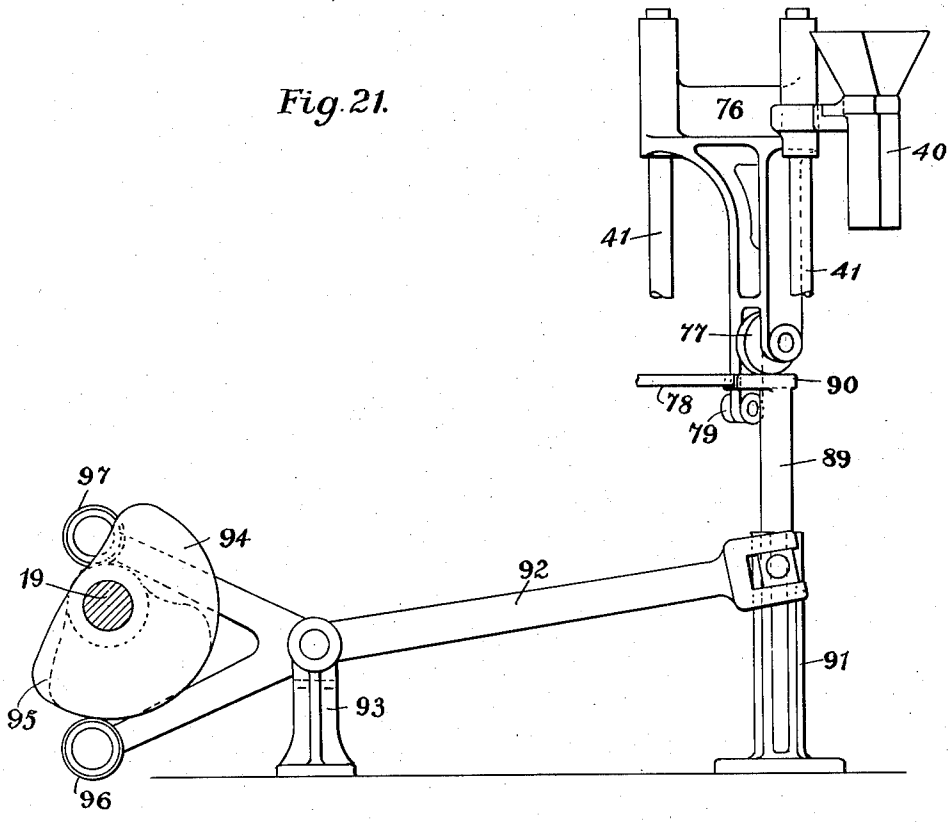
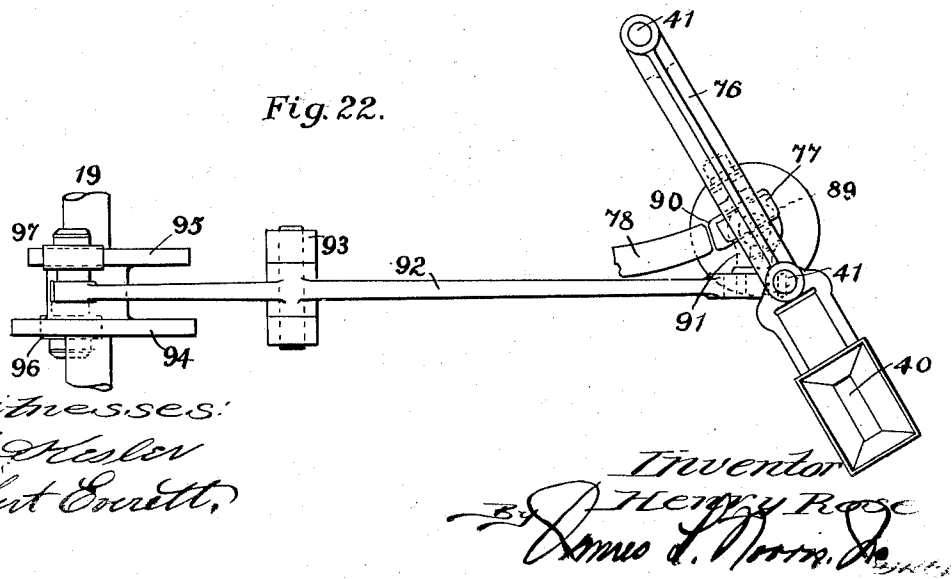


Fig. 22.



Witnesses:
C. E. Taylor
Robt. Everett.

Inventor
Henry Rose
By James L. Norris, Atty.

H. ROSE.

PACKAGING MACHINE.

APPLICATION FILED SEPT. 12, 1910.

1,025,882.

Patented May 7, 1912.

19 SHEETS—SHEET 11.

Fig. 23.

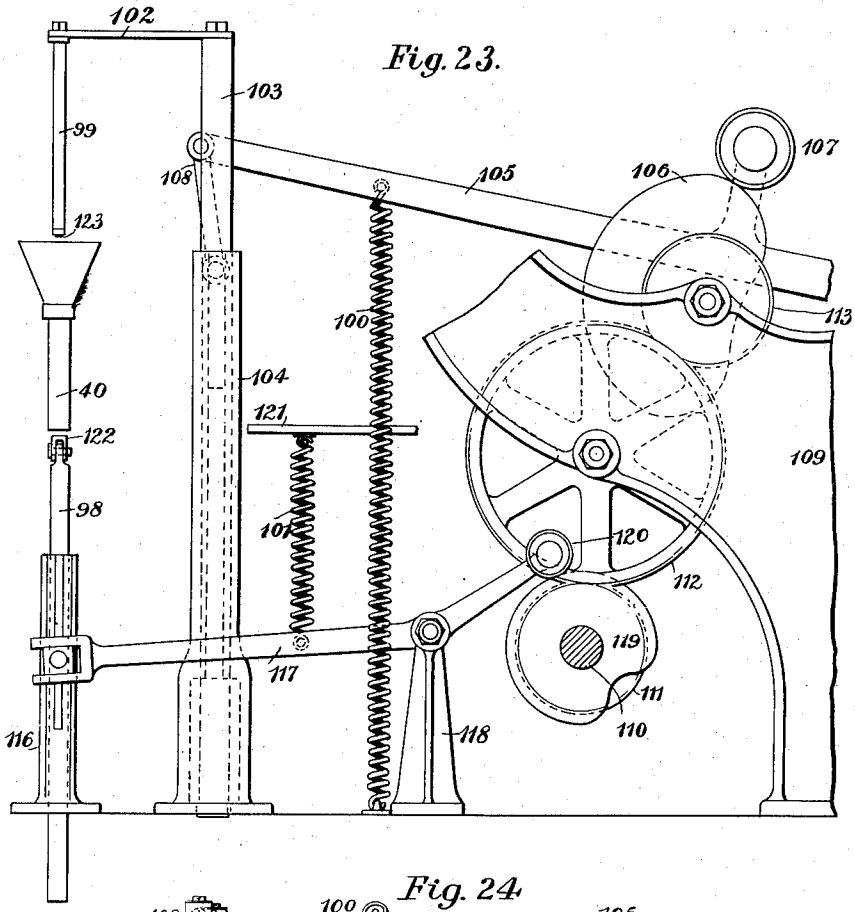
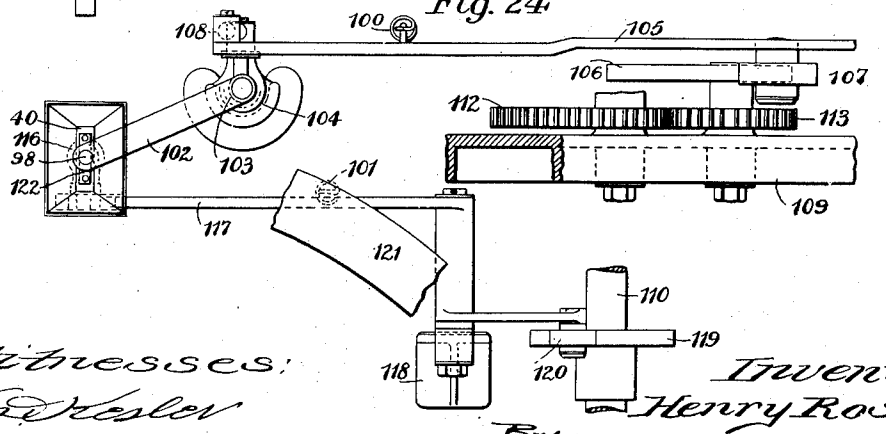


Fig. 24.



Witnesses:

C. E. Kesler

Robert Corritt

Inventor

Henry Rose

By

Jesse L. Norris, Jr.

Atty.

H. ROSE.

PACKAGING MACHINE.

APPLICATION FILED SEPT. 12, 1910.

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Patented May 7, 1912.

19 SHEETS—SHEET 12.

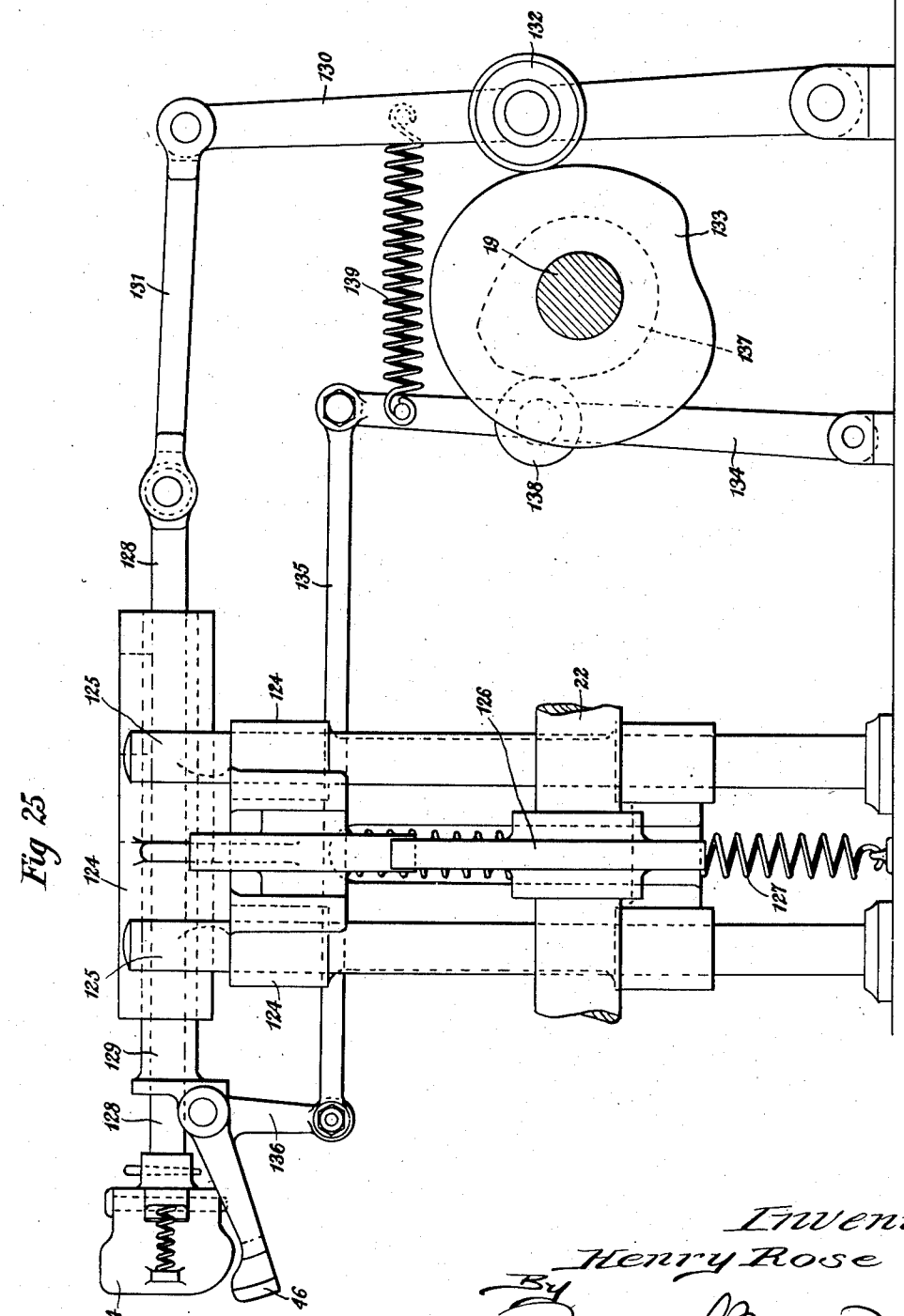

Fig 25

Witnesses:
C. Kesler
Robt Everett

Inventor
Henry Rose
By
James L. Norris, D.
Atty

H. ROSE.

PACKAGING MACHINE.

APPLICATION FILED SEPT. 12, 1910.

1,025,882.

Patented May 7, 1912.

19 SHEETS—SHEET 13.

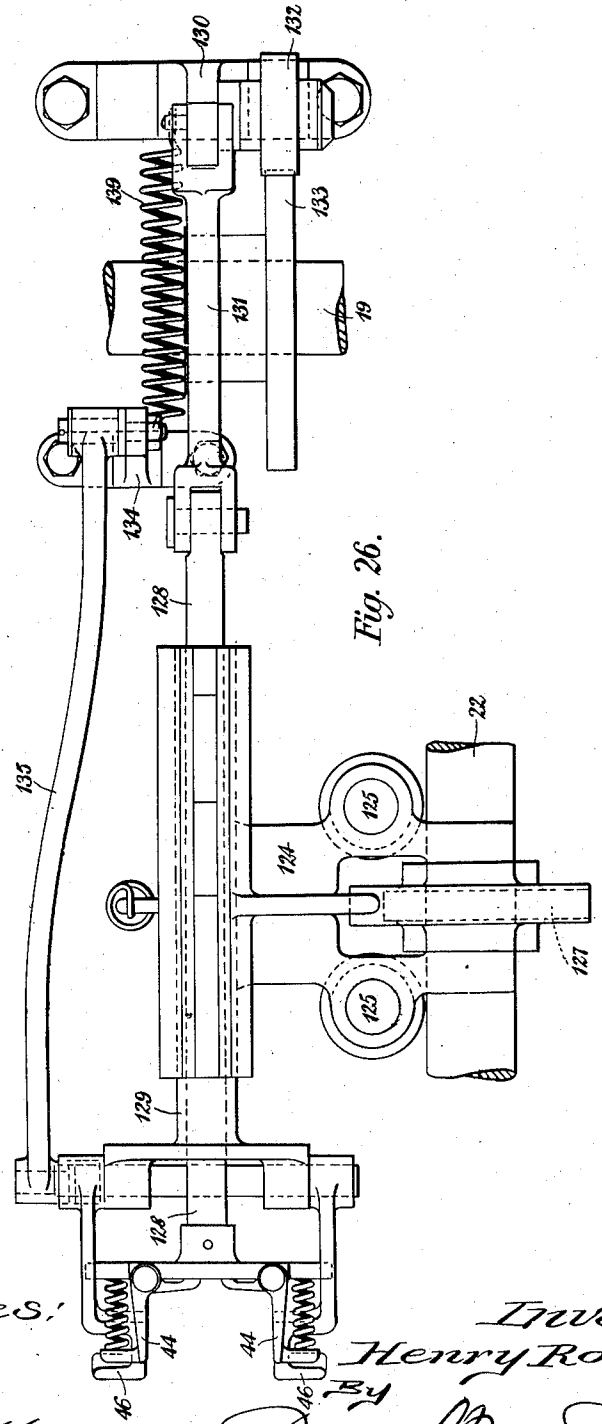

Fig. 26.

Witnesses:
Chas. Keeley
Robert Everett,

Inventor
Henry Rose
By
James L. Norris & Co.
Attys.

H. ROSE.

PACKAGING MACHINE.

APPLICATION FILED SEPT. 12, 1910.

1,025,882.

Patented May 7, 1912.

19 SHEETS—SHEET 14.

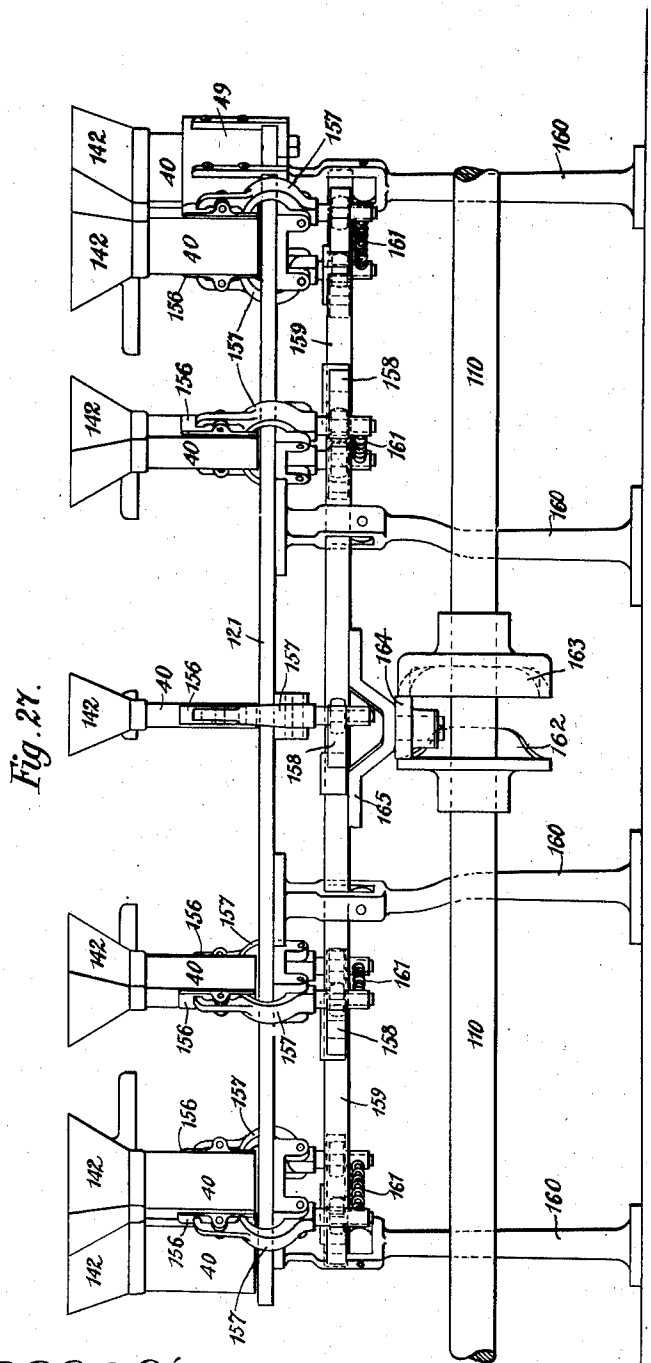

Fig. 27.

Witnesses:
C. Sedgwick
Robert Ewart.

Inventor
Henry Rose
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Atty

H. ROSE.

PACKAGING MACHINE.

APPLICATION FILED SEPT. 12, 1910.

1,025,882.

Patented May 7, 1912.

19 SHEETS—SHEET 15.

Fig. 28.

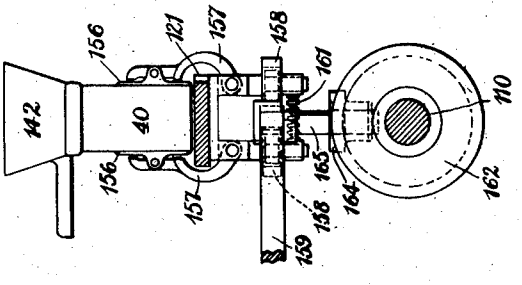


Fig. 29.

Witnesses:

C. D. Kesler

Robt. Emmett,

Inventor

Henry Rose

By James L. Norris. Atty

H. ROSE.

PACKAGING MACHINE.

APPLICATION FILED SEPT. 12, 1910.

1,025,882.

Patented May 7, 1912.

19 SHEETS—SHEET 16.

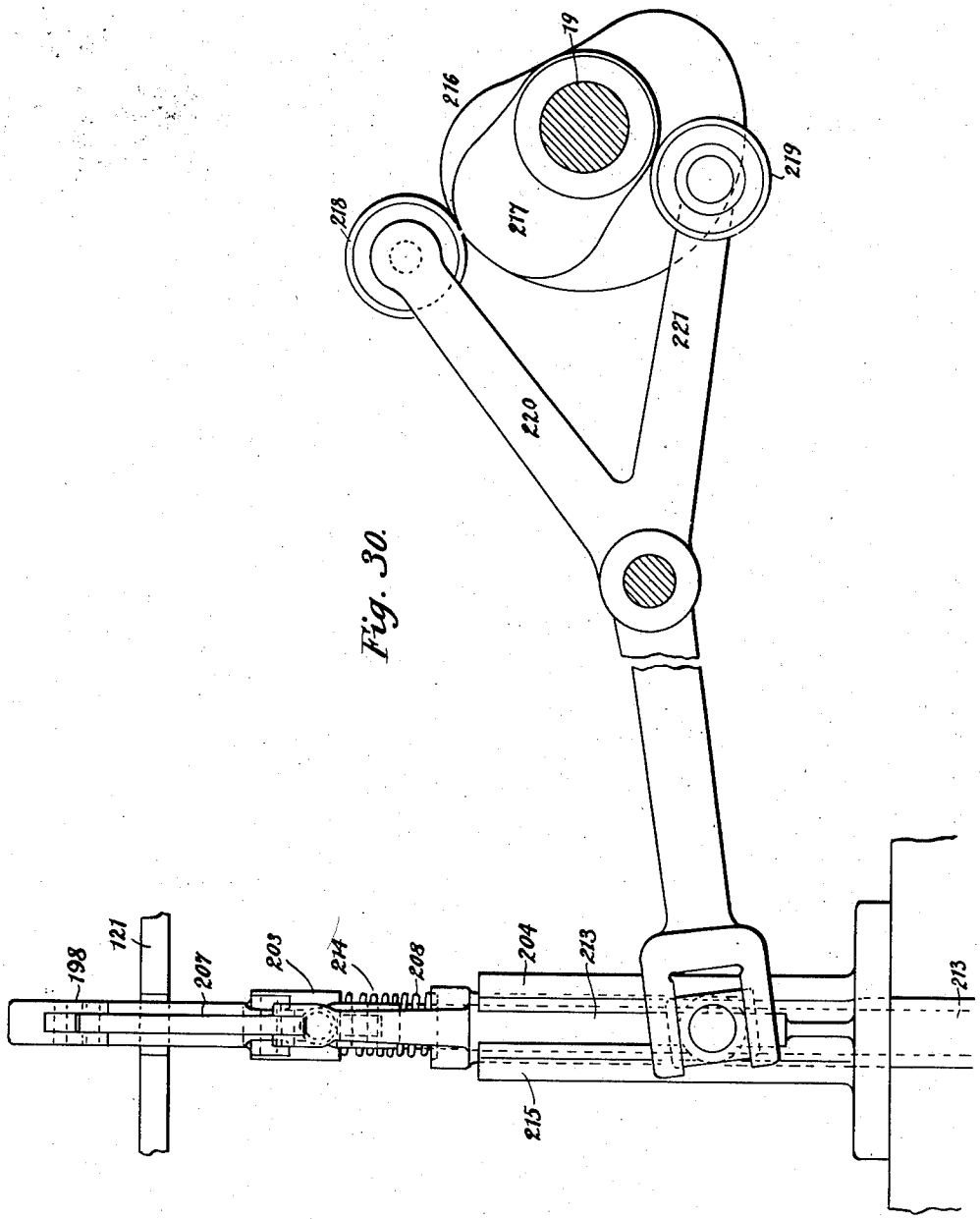


Fig. 30.

Witnesses:
C. A. Kesler
Robert Everett,

Inventor
Henry Rose
By
James L. Norris, Jr.
Atty

H. ROSE.

PACKAGING MACHINE.

APPLICATION FILED SEPT. 12, 1910.

1,025,882.

Patented May 7, 1912.

19 SHEETS—SHEET 17.

Fig. 31.

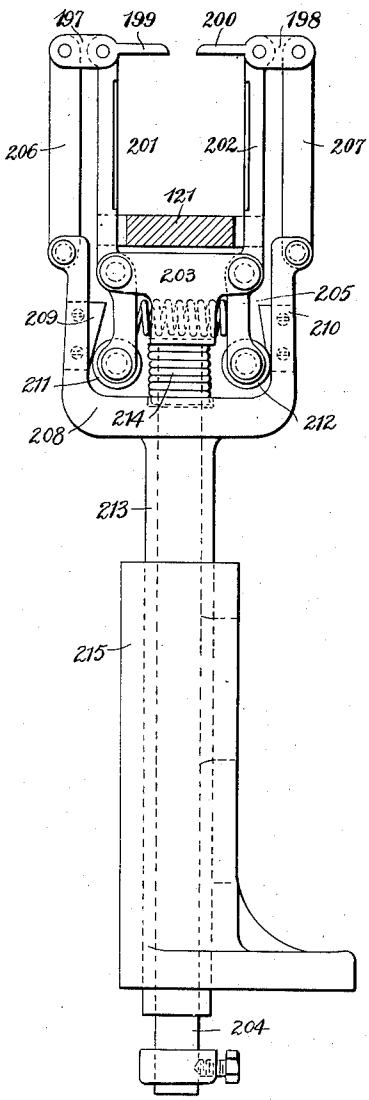
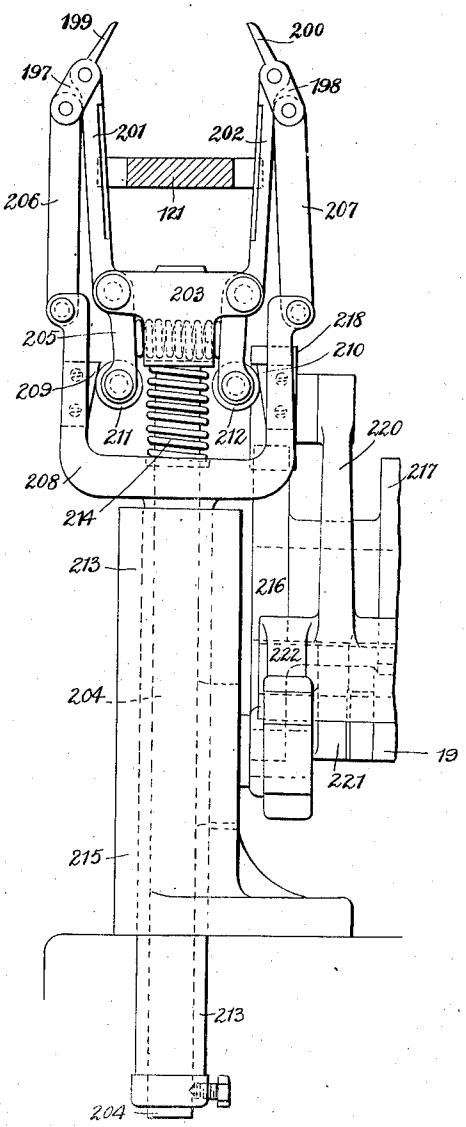


Fig. 32.



Witnesses
C. E. Kesler
Robert Everett.

Inventor
Henry Rose
By
James L. Norris, Jr.
Atty

H. ROSE.

PACKAGING MACHINE.

APPLICATION FILED SEPT. 12, 1910.

1,025,882.

Patented May 7, 1912.

19 SHEETS—SHEET 13.

Fig 33.

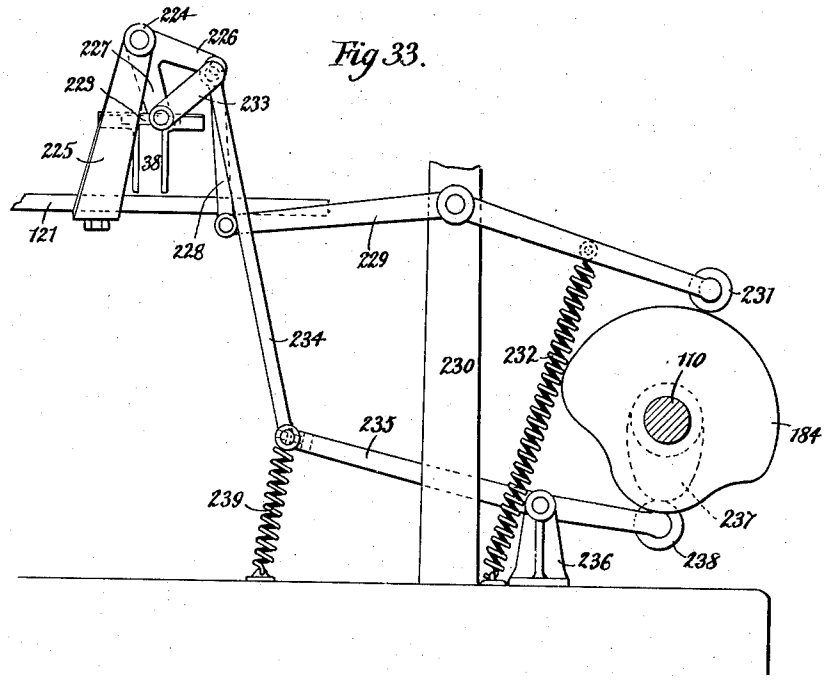
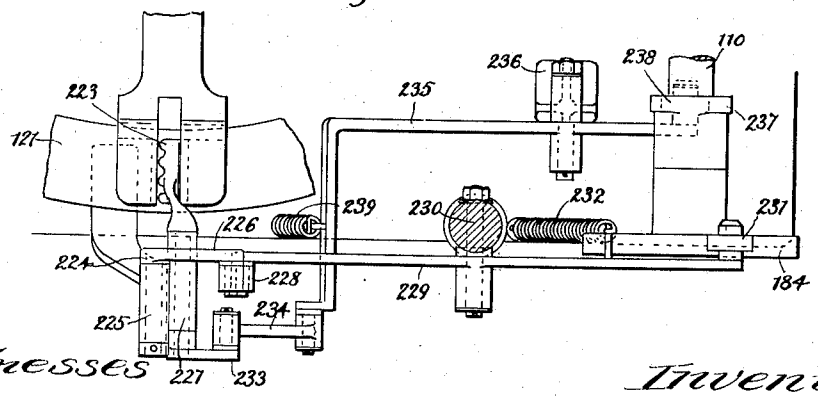


Fig 34.



Witnesses

C. S. Kader

Robert Emett,

Inventor.

Henry Rose

By

James L. Norris

Atty.

H. ROSE.

PACKAGING MACHINE.

APPLICATION FILED SEPT. 12, 1910.

1,025,882.

Patented May 7, 1912.

19 SHEETS—SHEET 19.

Fig. 35.

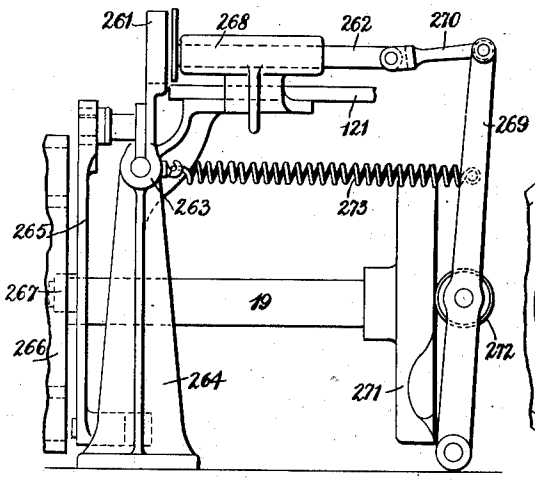


Fig. 36.

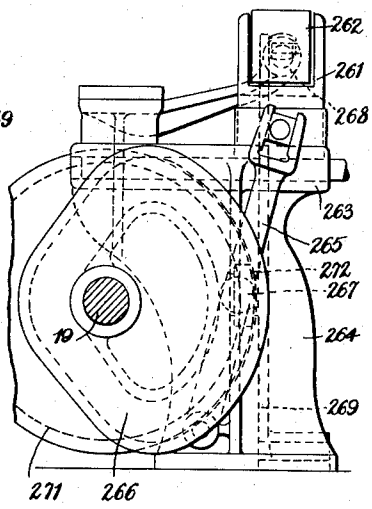
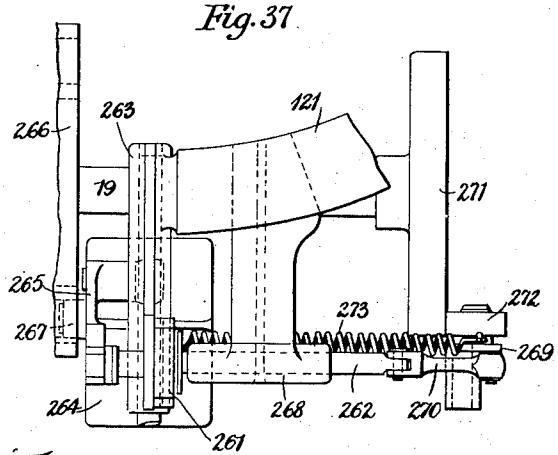


Fig. 37.



Witnesses:
Chas. Kesler
Robt Everett.

Inventor
Henry Rose
By
James L. Norris. D.
Atty

UNITED STATES PATENT OFFICE.

HENRY ROSE, OF GAINSBOROUGH, ENGLAND, ASSIGNOR TO RICHARD H. WRIGHT, OF DURHAM, NORTH CAROLINA.

PACKAGING-MACHINE.

1,025,882. Specification of Letters Patent. Patented May 7, 1912.

Application filed September 12, 1910. Serial No. 581,627.

To all whom it may concern:

Be it known that I, HENRY ROSE, a subject of the King of Great Britain and Ireland, residing at Albion Works, Gainsborough, in the county of Lincoln, England, have invented new and useful Improvements in Packaging-Machines, of which the following is a specification.

The object of this invention is to provide a machine which will make up packets of tobacco, tea, or other granular, divided, or powdered, material in a very rapid, neat, and generally efficient manner.

The machine is of the kind wherein formers are used by which the wrappers are pressed into a circular series of carriers, or molds, and partially folded, and into which formers the material to be wrapped is introduced, the said formers being afterward withdrawn, leaving the material in the wrappers in the molds, the folding of which wrappers is afterward completed.

I will describe my invention with reference to the accompanying drawings which illustrate a machine constructed in accordance with this invention, it being understood that I do not restrict myself to the precise details therein shown, or hereinafter described.

Figures 1 and 2 are opposite side elevations of the machine, looking in the direction of the arrows A and B, respectively, of Fig. 5; Figs. 3 and 4 are opposite end elevations thereof (the adhesive-applying device being removed in Fig. 3 and the driving pulley being removed in Fig. 4, for clearness) looking in the direction of the arrows C and D respectively of Fig. 5, and Fig. 5 is a plan. Fig. 6 is a plan of the wrapper with the requisite parts indicated where adhesive is applied; and Figs. 7, 8, 9, 10, 11, 12 and 13 are perspective views showing the progressive stages of the folding of the wrapper. Figs. 14 and 15 are respectively a side elevation and a plan of the device for applying adhesive to the wrapper; Figs. 16 and 17 are views at right angles to each other showing the adhesive applying rollers, and Fig. 18 is a similar view to Fig. 16 but showing the rollers in a different position. Figs. 19 and 20 show in elevation and plan respectively, means for lowering the former into its mold and Figs. 21 and 22 show, in elevation and plan respectively, means for raising the said former out of its mold; Figs. 23 and 24 show, in elevation and plan respectively, means whereby the wrapper is securely held while the former is carrying the said wrapper into the mold. Figs. 25 and 26 show in elevation and plan respectively, folders for folding over one of the edges of the wrapper at each side and folders for folding up the bottom folds over the last named folded edges. Figs. 27, 28, and 29 show in elevation, transverse section and plan respectively, pressers, and means for actuating them, for acting on the folded sides of the wrapper, to keep the said sides in shape, and to retain the cemented parts of the said sides closed until the cement is sufficiently dry. Figs. 30 and 31 show in elevations at right angles to each other the folders for folding over the upper two side folds of the wrapper. Fig. 32 is a similar view to Fig. 31, but showing parts in a different position to that shown in Fig. 31. Figs. 33 and 34 show in elevation and plan respectively, the folder for folding the rear top fold of the wrapper, and Figs. 35 and 36 show in elevations at right angles to each other and in Fig. 37 in plan means for ejecting the packages from the mold wheel and means for passing the said ejected packages into a suitable receptacle for the adhesive to dry.

The construction and operation of the machine is as follows:—

The wrappers 1 are fed along a trough 2 by means of a pair of endless traveling chains 3 having projections 4 thereon to an adhesive-applying device, which device applies adhesive at the requisite places of the wrapper indicated at 5, 6 and 7 in Fig. 6 of the accompanying drawings. The means for applying the adhesive to these places may (as shown in Figs. 14, 15, 16, 17 and 18 of the accompanying drawings) comprise rollers 8 and 9, the former having two sets of projections 10 and 11 longitudinally arranged on its periphery, and the latter having two sets of projections, 12 and 13, likewise arranged on its periphery. The sets of projections, 12 and 13, on the roller 9, are adapted to take adhesive from a roller 14, rotating in trough 15 containing adhesive, and transfer it to the sets of projections, 10 and 11, on the roller 8, which latter projections then apply the adhesive to the parts 5 and 6, of the upper side of the wrap-

per 1 as it passes between the rollers 8 and 9. Secured to the shaft 16 to which the roller 9 is secured is a roller 17 having projections 18, transversely arranged on its periphery, these projections being adapted to take up adhesive from the roller 14 and apply it to the parts 7 of the under side of the wrapper as it passes between the rollers 8 and 9 as aforesaid. The projections 4 are arranged at such a distance apart on the traveling chains 3, that there is no wrapper between the rollers 8 and 9 when the projections 12 and 13 are transferring the adhesive to the projections 10 and 11.

Any suitable means for imparting rotary motion at the required speeds to the machine rollers may be employed; this is shown in Fig. 5 of the accompanying drawings as being effected from the driving shaft 19 of the machine, which shaft transmits rotary motion, through bevel wheels 20 and 21, to a counter-shaft 22, the latter shaft 22 transmitting rotary motion to the respective rollers by the following means. Secured to the shaft 22 is a spur wheel 23 (see Figs. 14 and 15 of the accompanying drawings) engaging with a spur wheel 24 on a shaft 25 rotatable in bearings carried by a bracket 26 on the frame of the machine, the said shaft 25 has secured thereto a spur pinion 27, which, through an intermediate spur pinion 28, transmits rotary motion to a spur wheel 29 secured to the shaft 16 to which the rollers 9 and 17, are secured. Rotary motion is transmitted from the shaft 16 of the said rollers 9 and 17 to the shaft of the roller 8 by means of a spur-wheel 30, secured to the shaft 16, gearing with a spur wheel 31, secured to the shaft of the roller 8. The aforesaid intermediate spur pinion 28, also transmits rotary motion to a shaft 32 by engaging with a spur wheel 33 secured to the said shaft. The shaft 32 has secured thereto a pair of sprocket wheels 34 around which the endless chains 3 pass and by the rotation of which the said chains are operated. The chains 3 pass around and are supported at the other end of the trough by a pair of pulleys. (Not shown.) Rotary motion is transmitted to the roller 14 by the spur wheel 29 gearing with a spur wheel 36 secured to the shaft of the said roller 14.

Adhesive having been applied as aforesaid the wrapper 1 is fed to a reciprocating table 37 (see Figs. 1, 2, 5, 14 and 15 of the accompanying drawings) which delivers it to and deposits it on one of a series of molds 38 formed in an intermittently rotatable horizontal wheel 39 (hereinafter referred to as the mold wheel) and under one of a circle of formers 40 each of which is slidable on vertical guides 41 carried on the said wheel 39. The said former 40 is then caused to descend and carry the said wrapper into the mold whereby the sides 42 and 43 of the wrapper are folded upwardly as shown in Fig. 7 of the accompanying drawings, so that the top edges extend above the mold. Folders 44 (see Figs. 25 and 26 of the accompanying drawings) then advance and fold over the edges 45 of the side 42 of the wrapper as shown in Fig. 8 of the accompanying drawings, and then other folders 46 (see Figs. 25 and 26 of the accompanying drawings) come into operation and fold up the bottom folds 47 as shown in Fig. 9 of the accompanying drawings, and, after these folders 44 and 46 have retired, the circle of molds 38 makes a partial rotation so that the unfolded edges 48 of the side 43 of the wrapper come in contact with stationary folders 49 (see Figs. 27 and 29 of the accompanying drawings) and the said edges are folded over the folds 45 and 47 previously made as shown in Fig. 10 of the accompanying drawing. These respective parts are constructed and the operations effected as follows:—The table 37 (see Figs. 1, 2, 5, 14 and 15 of the accompanying drawings) onto which the wrapper 1 is fed is caused to be reciprocated by means of a cam 50 secured to the shaft 22 which cam, through an antifriction roller 51 operates a lever 52 one end of which is pivoted to the before mentioned bracket 26 and the other end of which is connected by side links 53 to a lever 54, which latter lever is pivoted, at one end, to an extension 55 and connected, at its other end, by a link 56, to a guided rod, or bar, 57, attached to the said table 37. When the larger diameter of the cam 50 is acting upon the roller 51 the said table is caused to retire and compress a spring 58, and when the smaller diameter of the said cam is in engagement with the said antifriction roller, the said spring 58 causes the said table to be moved forward and the wrapper, deposited thereon, carried to the mold 38. Suitable stops 59 and 60 and guide pieces 61 may be provided on the table 37 to prevent angular movement of the said wrapper on the table. In order to prevent the table 37 oscillating transversely of the trough 2 one member of a T-shaped piece 62 is attached to the rod, or bar, 57, the other members of which slide in guides 63 secured to the underside of the said trough 2. An aperture 64 is formed in the said table 37 to permit of the former 40 descending and pushing the wrapper from the table into the mold 38.

Intermittent partial rotation of the mold wheel 39 may be effected in any convenient manner and constitutes no part of this invention, it is shown in Figs. 1, 2, 3, 4, and 5 as being effected from the main driving shaft 19 of the machine which shaft transmits rotary motion to a vertical shaft 65 by means of bevel wheels 66 and 67 secured to

the said shafts 19 and 65 respectively. Secured to the vertical shaft 65, is a peripheral cam 68 carrying on its under side a roller 69 which is caused, by the rotation of the said cam, to successively engage with, and disengage from, one of a series of recesses 70 formed in the periphery of a disk 71 secured to a shaft 72 carrying the mold wheel 39. The number of recesses 70 correspond to the number of molds 38 formed in the wheel 39. The rotation of the cam 68 causes the roller 69 to enter one of the recesses 70 in the disk 71 and partially rotate it, which partial rotation is transmitted to the mold wheel, through its shaft 72, until the said roller 69 is revolved out of the path of the said disk 71, the said disk and mold wheel being then held stationary until the cam 68 by its continuous rotation, causes the said roller to enter the succeeding recess in the disk, whereupon another partial rotation is transmitted to the mold wheel. Means are provided for causing the disk 71 to be held locked while in its stationary position the said means preferably consisting of a two-armed lever 73, pivotally mounted on the frame of the machine, each arm of which lever carries an anti-friction roller 74, 75, the roller 74 being adapted to be engaged by the aforesaid cam 68 to actuate the lever 73 whereby the roller 75 is caused to alternately engage with, and disengage from, one of the series of recesses 70 in the disk 71; the arrangement being such that when the roller 69 is entering one of the recesses 70, the roller 75 is leaving one of the other recesses, so that the disk is free to partially rotate, and vice versa, when the roller 69 is leaving one of the said recesses the roller 75 is entering another recess, whereby movement of the disk is prevented during its stationary periods. Each of the formers 40 is carried by a bracket 76 (see Figs. 19, 20, 21, and 22 of the accompanying drawings) which is adapted to be slid on the guide rods 41 carried by the mold wheel, whereby, during a required number of intermittent partial rotations of the mold wheel 39, the former can be caused to be lowered into its mold 36, and during the remaining number of intermittent partial rotations of the mold wheel, the said former can be caused to be raised out of its mold. The formers 40 are successively lowered into their respective molds, when the said molds are in the position to receive, and have had delivered thereto, a wrapper, and they remain lowered until, by a number of intermittent partial rotations of the mold wheel, they are brought to the position where the last of several plungers (to be hereinafter referred to) is arranged to hold down the material which has been placed in the wrapper, the former is then raised and is maintained raised, until the mold is again brought to the position to receive another wrapper. The sliding bracket 76 carrying the former, as aforesaid, is maintained raised, while making the required number of intermittent partial rotations, by an antifriction roller 77, rotatably mounted on the lower part of the said bracket, the roller being adapted to run on a track, or guide-bar, 78, secured to any convenient part of the frame of the machine and shaped to conform to the line of travel of the said roller 77. The bracket 76 may be caused to descend and ascend while the mold-wheel is at rest, by any suitable means, these movements are shown in Figs. 19, 20, 21 and 22, as being effected, as follows: On the inner side of the lower end of the bracket 76 is a pin, or projection, 79, which at, or about, the time the aforesaid roller 77 is running off the termination of the track, or guide-bar 78, enters a grooved piece 80, (see Figs. 19 and 20 of the accompanying drawings) on the upper end of a vertical rod 81, slidably mounted in a slotted guide 82, so that when the said rod 81 descends, the grooved piece 80 acting on the pin, or projection, 79, causes the bracket to slide down its guide-rods 41, thereby carrying the former into its mold. The vertical rod 81 is operated by a lever, 83, pivoted to a bracket 84, secured to the frame of the machine, which lever is actuated by coacting cams, 85 and 86, secured to the main driving shaft, 19, of the machine, through antifriction rollers 87 and 88, carried by diverging arms, forming the tail of the said lever 83. The last intermittent partial rotation of the mold-wheel with the former in its mold brings the bracket 76 into a position to be raised by a vertical rod 89, provided with a head 90, and slidably mounted in a slotted guide 91, see Figs. 21 and 22 of the accompanying drawings, so that when the said rod 89 ascends, its head 90 engages with the beforementioned roller 77, on the bracket 76, and lifts the said bracket, which thereby carries its former out of its mold. When the rod 89 is raised its head 90 is in alinement with the commencement of the track, or guide-bar, 78, so that on the next intermittent partial rotation of the mold-wheel the said anti-friction roller 77 runs on the said track, or guide-bar, and the bracket with its former is maintained raised as aforesaid.

The vertical rod 89 is operated by a lever 92, pivoted to a bracket 93, secured to the frame of the machine, which lever is actuated by co-acting cams, 94 and 95, secured to the main driving shaft 19 of the machine, through anti-friction rollers 96 and 97 carried by diverging arms, forming the tail of the said lever 92. If desired, means may be provided whereby the wrapper is securely held while the former is carrying the said wrapper into its mold to insure the wrapper

being correctly placed therein. A preferred means for effecting this is shown in Figs. 23 and 24 of the accompanying drawings, which comprise two superposed vertically moving rods, 98 and 99, and means for operating them, the arrangements being such that the upper rod 99 is caused to descend by the action of a spring 100, into the former, and grips the wrapper, which has been placed on the mold, between its lower end and the upper end of the rod 98, which had previously been caused to be raised by the action of a spring 101, and while the said former 40 is descending into its mold, by the means already described, the rods 98 and 99, with the wrapper gripped between them, also descend, by the action of the said spring 100. The rod 99 is secured by a connecting piece 102, to a rod 103, slidably mounted in a vertical slotted guide 104, secured to the frame of the machine, which rod 103, is caused to be raised when the wrapper has been placed in its mold, by a lever 105, actuated by a cam 106 through an antifriction roller 107, the said lever 105 being connected to the rod 103 by a connecting link 108. The cam 106 is suitably mounted on a stud carried by a bracket 109, and the said cam has rotary motion transmitted thereto from a counter-shaft 110 by means of a spur wheel 111, secured to the said shaft, engaging with an intermediate spur wheel 112 carried on the said bracket 109, which intermediate wheel engages with a spur wheel 113 integral with the said cam 106. Rotary motion is transmitted from the counter-shaft 22 to the shaft 110 by means of bevel wheels 114 and 115 secured on the respective shafts, see Figs. 3 and 5 of the accompanying drawings. The cam 106 acts only to raise the rod 99, the spring 100, one end of which is connected to the lever 105 and the other end connected to the frame of the machine, acting to lower the said rod as aforesaid. The rod 98 is slidably mounted in a vertical slotted guide 116 secured to the frame of the machine which rod 98 is caused to be lowered and maintained lowered for the requisite period by means of a lever 117 pivotally mounted on a bracket 118 secured to the frame of the machine, the said lever 117 being actuated by a cam 119, secured to the shaft 110, through an antifriction roller 120. One end of the aforesaid spring 101 is attached to the said lever 117 and the other end is attached to the underside of a stationary platform, or table, 121 shaped to conform to the line of travel of the formers and upon which the packages can bear when the said formers are in their lowered position (see Figs. 27, 28 and 29 of the accompanying drawings). In order to insure a firm grip of the wrapper and without injury thereto by the rods 98 and 99, the upper end of the said rod 98 may be provided with a pivoted head 122 and the lower end of the said rod 99 may be provided with rubber, or other resilient material 123.

The hereinbefore referred to folders 44 and 46 for folding over the edges 45 of the side 42 and for folding up the bottom folds 47, respectively, are carried by a bracket 124, slidably mounted on guide rods 125 secured to the frame of the machine. The said bracket 124 is caused to be raised and lowered so that the folders are alternately raised into operating position and then lowered out of the path of the mold wheel to permit of the succeeding partial rotation of the said wheel. This raising and lowering of the bracket 124 can be effected as shown in Figs. 25 and 26 of the accompanying drawings by a cam 126 secured to the counter-shaft 22, in opposition to the action of a spring 127. The folders 44 and 46 are carried on the said bracket and are caused to be operated preferably in the following manner:—The folder 44 is pivotally mounted on a rod 128 slidably mounted in a sleeve 129 carried by the upper part of the said bracket 124, which rod 128 is caused to reciprocate in the said sleeve by means of a lever 130 pivoted at its lower end, to the frame of the machine and connected, at its upper end, by a link 131, to the said rod 128, the said lever being actuated, through an antifriction roller 132, by a cam 133 secured to the driving shaft 19 of the machine. The folder 46 is pivotally mounted on the said sleeve 129 and it is caused to oscillate on its pivot, to fold in the fold 47, by means of a lever 134, pivoted, at its lower end, to the frame of the machine. and connected, at its upper end, by a link 135 to an arm 136 on the said folder 46. The lever 134 is operated by means of a cam 137, secured to the driving shaft 19, through an antifriction roller 138. A spring 139, attached to the levers 130 and 134, acts to maintain the antifriction rollers 132 and 138 in contact with their respective cams.

The wrapper having been fed to a mold, its side edges 45 and bottom folds folded, and the mold wheel held stationary after having made a partial rotation whereby the edges 48 have been folded by the stationary folders 49, the mold and former with the partially folded wrappers (in the form of a bag as shown in Fig. 10 of the accompanying drawings) thereon is now in a position beneath a device which supplies the material to be wrapped, this device being of any suitable description which will deliver the material in the requisite amount for each package. The device shown in Figs. 1, 3 and 5 of the accompanying drawings consists of a hopper 140 containing the material, and having a reciprocating pocket 141 for containing the requisite amount of the material

to be wrapped, the said pocket being so adapted that when in one position it receives, through an opening in its upper part, the material from the hopper 140, and when in its other position the said opening is closed and an opening in its lower part opened through which the contents of the said pocket fall into the former beneath it, the said former being preferably provided with a widened top 142 to facilitate the supply of the material thereinto. The hopper 140 may be carried on and secured to the before-mentioned bracket 109 in any suitable manner, and the pocket 141 may, as shown, be reciprocated by means of a bell-crank lever 143, pivoted to the said bracket 109, the said bell-crank lever being actuated, in opposition to the action of a spring 144, by a cam 145, secured to the shaft 110, through an antifriction roller 146 on an arm of the said bell-crank lever, the other arm of which lever is connected by a link 147 to the said pocket 141. If desired stirrers 148 may be provided within the hopper 140, such for example as shown in Figs. 3 and 5 of the accompanying drawings, these stirrers are shown carried on a vertical shaft 149 to which rotary motion is transmitted from the hereinbefore referred to intermediate spur wheel 112, by means of a sprocket wheel 150, integral with the said spur wheel, a chain 151 passing around the said sprocket wheel and another sprocket wheel 152 secured to a shaft 153, carried in bearings on the hopper 140, and bevel wheels 154 and 155 secured to the shafts 149 and 153 respectively.

Each time (or any desired number of times) that the molds, formers, and wrappers come to rest between the intermittent movements of the circle of molds (from the time the wrappers are applied to the formers until the formers are withdrawn from the packages) pressers 156, as shown in Figs. 27 and 28 of the accompanying drawings, are caused to press on each of the folded sides of the wrapper, these pressers 156 corresponding in size and shape to the said sides, so as to keep the said sides in shape and cause the parts which have been cemented to adhere by retaining the sides properly closed until the cement is sufficiently dry. As shown in the drawings the folded sides of the wrapper are pressed by pressers 156 arranged in pairs, and each presser is hinged to the upper part of a lever 157 pivoted to the underside of the stationary platform, or table, 121, hereinbefore referred to. The lower ends of the levers 157 are adapted to be acted upon by cam shaped projections 158 on a bar 159, or the equivalent, shaped to conform to the line of travel of the circular series of molds, the said bar 159, or its equivalent, being carried in, and guided by, suitable openings formed in standards 160 which support the aforesaid stationary platform, or table 121. A slight oscillatory motion of the said bar 159 causes the cams 158 thereon to act on the lower end of the levers 157 whereby the upper end of each pair of levers are caused to recede from each other, in opposition to the action of a spring 161, to permit of the wrapper on the former entering between the respective pairs of pressers and to release the pressers after they have by means of the said spring 161 acted to press the folded sides of the said wrapper. The oscillation of the bar 159, or its equivalent, may be effected by co-acting face cams 162 and 163 secured to the shaft 110 through an antifriction roller 164 mounted in a bracket 165 secured to the underside of the said bar 159, or its equivalent.

After the filling of the material has been effected suitable plungers 166, 167, 168 and 169 (see Figs. 1, 2, 4 and 5 of the accompanying drawings) are, at the next two, or three, or any desired number, of positions of the formers and molds, caused to descend and press upon the material in the formers and force it down, preferably by a succession of such plunger actions and by plungers which are shaped so that each acts on different parts of the top of the material, the last plunger 169 being arranged to hold down the material in the wrapper while the former is being withdrawn therefrom. The plungers 166, 167 and 168 are carried by a bracket 170 slidably mounted on vertical guide rods 171 secured to the frame of the machine, the said bracket being caused to ascend and descend on the said rods by means of a lever 172, pivoted to a bracket 173 on the frame of the machine, connected at one end, by a link 174, to the said bracket 170 and actuated at the other end by a crank pin 175 adjustably mounted on a disk 176 secured to the hereinbefore mentioned shaft 22, the said pin 175 engaging in a suitable slot 177 formed in the said end of the lever 172. The plunger 169 is carried by a bracket 178 slidably mounted on vertical guide rods 179, secured to the frame of the machine, the said bracket being caused to ascend and descend on the said rods by means of a lever 180 pivoted, at one end, to a bracket 181 on the frame of the machine and connected, at the other end by a link 182, to the said bracket 181. The said lever may be caused to be actuated by means of any suitable rotating part of the machine, for example, as shown in Fig. 4 of the accompanying drawings it may be effected by means of a crank pin 183 carried on a cam 184 (to be hereinafter referred to) secured to the shaft 110, the said crank pin 183 engaging a slot 185 formed in the said lever 180. The formers 40 are by the means hereinbefore described, caused to be raised out of the molds when

the molds are successively brought to rest beneath the last plunger 169. The arrangement of the means for effecting the raising of this plunger 169 is such that the said plunger holds down the material in the wrapper while the former is rising, and then the plunger is raised out of the former to permit of the succeeding partial rotation of the mold wheel. A wiper 186 such for example as a brush, can if desired be caused to bear on the former as it rises out of its mold to wipe off any material that may have adhered to the said former. A preferred arrangement for effecting this is shown in Figs. 1, 4 and 5 of the accompanying drawings which consists of a wiper 186 carried on a bar, or rod, 187 slidably mounted in a bracket 188 secured to the frame of the machine, a cam 189 secured to the shaft 110 effects the necessary requisite reciprocating movement of the wiper by actuating, through an antifriction roller 190, a lever 191 pivoted, at its lower end, to the frame of the machine and connected, at its upper end by a link 192, to the said bar, or rod 187. A spring 193 acts to keep the antifriction roller 190 in contact with the cam 189. The former having been raised out of its mold, as aforesaid, further folders are then caused to fold over the upper folds, preferably first the two side folds 194 as shown in Fig. 11 of the accompanying drawings, and then the rear fold 195 as shown in Fig. 12 of the accompanying drawings, and afterward the front fold 196 as shown in Fig. 13 of the accompanying drawings.

The folders for folding over the upper two side folds are, as shown in Figs. 30, 31 and 32 of the accompanying drawings preferably constructed and caused to operate as follows:—Arms 197 and 198 carrying folder blades 199 and 200 are centered to lever arms 201 and 202 which extend down each side of the package and are centered to a cross-head 203 mounted on the upper end of a vertical spindle 204. A spring 205 presses the lever arms 201 and 202 toward the package. The outer ends of the arms 197 and 198 carrying the folder blades 199 and 200 are connected by links 206 and 207 to the bifurcations of a forked-piece 208 which bifurcations and links 206 and 207 extend up outside of the aforesaid lever arms 201 and 202, the said bifurcations of the forked-piece carry wedge-shaped pieces 209 and 210 to act upon rollers 211 and 212 on the lower ends of the said lever arms 201 and 202 to open the upper ends of the said lever arms and the folder blades 199 and 200 against the action of the aforesaid spring 205 and keep them open when the folders 199 and 200 are out of action, the said forked-piece 208 being carried by a sleeve 213 on the aforesaid vertical spindle 204 and a spring 214 being placed between the said forked piece 208 and the cross-head 203. The spindle 204 and sleeve 213 pass through a suitable vertical guide 215 secured to the frame of the machine and the sleeve 213 can be raised and lowered by co-acting cams 216 and 217, secured to the driving shaft 19 of the machine, acting upon rollers 218 and 219 carried by diverging arms 220 and 221 forming the tail of a lever 222 whose other end is arranged to act on the aforesaid sleeve 213. When the upper sides 194 of the wrapper are to be folded the sleeve 213 carrying the forked-piece 208 rises and carries up the cross-head 203, lever arms 201 and 202 and folder blades 199 and 200 which are then in their open position. The cross-head 203 comes against the stationary platform, or table, 121, when the movement of the lever arms 201 and 202 and folders 199 and 200 is arrested with the said folders in proper position for turning over the folds 194, the forked piece 208 continuing to move so that it compresses the spring 214 and its wedge pieces 209 and 210 permit the lever arms 201 and 202 to move inward, under the action of the spring 205, against the package and the links 206 and 207 connecting the forked-piece 208 to the arms 197 and 198 cause the folders 199 and 200 to turn down and effect the folding of the upper side folds 194 while the lever arms 201 and 202 press upon the sides of the package. When the sleeve 213 is moved in the opposite direction the folders 199 and 200 are opened out and they, and the other parts, are retracted by the continued movement of the parts in the reverse direction to that in which they move for folding.

The upper rear fold 195 of the wrapper can be turned down by a folder 223 which can be suitably carried by a swinging carrier 224 and is caused to swing down onto the package and caused to operate preferably by the means shown in Figs. 33 and 34 of the accompanying drawings. The carrier 224 is pivotally mounted on a bracket 225 secured to the underside of the stationary platform, or table, 121, and is provided with arms 226, 227, one 226, of which is connected, by a link 228, to a lever 229, pivoted to the lower part 230 of one of the guide rods 179, the other end of the said lever 229 being actuated by the cam 184 (hereinbefore referred to) through an antifriction roler 231, whereby the said carrier 224 is caused to swing on its pivot to move the folder 223 out of the path of the mold when the mold wheel is partially rotating. A spring 232 acts to keep the antifriction roller 231 in contact with the cam 184. The folder 223 is pivotally mounted in a sleeve on the other arm 227 of the carrier 224, and it is caused to turn, to fold over the said upper rear fold 195, by an arm 233 secured

thereto, the said arm being connected, by a link 234, to a lever 235, pivoted to a bracket 236 secured to the frame of the machine, and actuated by a cam 237 secured to the shaft 110, through an antifriction roller 238. A spring 239 acts to keep the antifriction roller 238 in contact with the said cam 237.

When the upper rear fold 195 has been folded and the folder 223 has retired as aforesaid the circle of molds advances another step and the last portion 196 of the wrapper is folded by a stationary folder 240 (see Figs. 2, 4 and 5 of the accompanying drawings) which preferably consists of a plate, as shown, suitably mounted on the stationary platform, or table, 121, with which plate, or folder, 240, the said part 196 of the wrapper to be folded comes in contact. The said plate 240 may constitute the upper part of a channeled track, or inverted U-shaped channel 241 through which the packages now pass until they come into position to be ejected.

The packages are by any suitable means ejected from the molds and passed into a receptacle, or channel, 242 (see Figs. 1, 2, 3 and 5) which may, as shown, have traveling upper and lower parts 243 and 244 or in which the packages are pressed forward by succeeding packages, so that the packages remain in the receptacle, or channel, a sufficient time for the adhesive material to become dry enough to retain the folds in position. The traveling upper and lower parts 243 and 244 of the channel 242 are, in the arrangement shown in the accompanying drawings, constituted by the lower part of a traveling band 245 and the upper part of another traveling band 246, the band 245 passing around pulleys 247 and the band 246 passing around pulleys 249. Rotary motion is preferably transmitted from the driving shaft 19 of the machine to the shaft of the pulley 247 by means of a bevel wheel 251, secured to the said driving shaft, gearing with a bevel wheel 252 rotatably mounted on a bracket 253, the said bevel wheel 252 having, integral therewith, a sprocket wheel 254, around which and a sprocket wheel 255, secured to the shaft of the pulley 247, a chain 256 passes. Rotary motion may be transmitted from the shaft of the pulley 247 to the shaft of the pulley 249 by means of a spur wheel 257, secured to the shaft of the pulley 247, gearing, through intermediate spur pinions 258 and 259, with a spur wheel 260 secured to the shaft of the said pulley 249.

A preferred means for ejecting the packages from the molds and for passing them into the channel 242 may, as shown in Figs. 35, 36 and 37 of the accompanying drawings, comprise a forked-piece 261 adapted to be reciprocated in a direction transversely to the said channel 242 and between the upstanding forks of which the packages can successively enter when the molds are brought to the ejecting position, a rearward movement of the said reciprocating piece 261 effecting the removal of the package from its mold through the open end thereof, and a reciprocating plunger 262 adapted to be operated so that it pushes the said package from between the forks of the said reciprocating piece 261 into the channel 242 aforesaid. The forked-piece 261 in the arrangement shown in the said figures is slidably mounted on a horizontal guide 263 integral with a bracket 264 secured to the frame of the machine and it is caused to reciprocate by a lever 265 pivoted to the said bracket 264, the said lever being actuated by grooved cam 266 within the groove of which an antifriction roller 267 on the lever engages. The plunger 262 in the arrangement shown in the said figures is slidably mounted in a horizontal guide 268 secured to the stationary platform, or table, 121 and this plunger is caused to reciprocate by a lever 269 pivoted at its lower end to the frame of the machine and connected at its upper end, by a link 270, to the said plunger 262, the said lever 269 being actuated by a face cam 271 through an antifriction roller 272. A spring 273 acts to keep the roller 272 in contact with the cam 271.

I claim as my invention:

1. In a machine for making up packets of material, the combination of a movable carrier, a plurality of molds mounted thereon and movable therewith, a table reciprocable above the path of movement of said molds having means for receiving and positioning a wrapper blank thereon, and also provided with a slot, means for intermittently operating the carrier to successively position the molds thereon in coöperative relation with said table, means for reciprocating the table with a wrapper positioned thereon so as to bring the slot in the table over the entrance to a mold on the carrier, and a plunger reciprocable transversely of the table and operable to engage an intermediate portion of a wrapper blank thereon and to carry it through the slot in the table and into the mold.

2. In a machine for making up packets of material, the combination of a mold, a wrapper feeding table reciprocable transversely of the mold and provided with devices for positioning a wrapper blank thereon, means operative independently of the table to feed a wrapper blank thereto, and to apply adhesive to the blank while being fed to the table, means to carry the table and the wrapper blank thereon into coöperative relation with the mold, and means operative to engage an intermediate portion of the wrapper blank and to carry it from the table and into the mold.

3. In a machine for making up packets of material, the combination of a mold, a plunger movable into and out of the mold, a table movable to and from a position between the plunger and mold and having a slot arranged in alinement with the path of movement of the plunger and also provided with devices for positioning a wrapper blank thereon, a roller mounted at the receiving end of the table and having projections thereon to receive and apply adhesive to the wrapper blank as the latter is fed to the table, said roller having means for operating it independently of the movement of the table, means for moving the table to carry the wrapper blank into coöperative relation with the mold, and means for subsequently operating the plunger whereby the latter will engage an intermediate portion of the blank and carry it through the slot in the table and into the mold.

4. In a machine for making up packets of material, the combination of a movable carrier, a plurality of molds mounted thereon and movable therewith, means for successively advancing wrapper blanks to the molds on said carrier, a former having means for introducing it into a mold, a pair of opposed and alined reciprocatory plunger mounted at opposite sides of the path of movement of said molds, one of said plungers being operative through said former, and means for operating said plungers to first grip the intermediate portion of a blank between them and to subsequently carry the wrapper blank into the respective mold on the carrier.

5. In a machine for making up packets of material, the combination of a mold, a former movable into and out of the mold, means for feeding a wrapper blank into a position between the mold and former, means for operating the former to carry the wrapper blank into the mold, a pair of opposed plungers one of which operates through the former, and means for reciprocating said plungers to grip an intermediate portion of the wrapper blank, one of said plungers being movable into the mold simultaneously with the former, and while the wrapper blank is engaged by such plunger.

6. In a machine for making up packets of material, the combination of a mold, a former movable into and out of the mold, means for positioning a wrapper blank between the mold and former, means for operating the former to carry the wrapper blank in folded condition into the mold, and a pair of opposed and alined plungers one of which operates through the former, one of said plungers having a pivoted wrapper-engaging head and the other having a resilient portion to engage the wrapper, and means for controlling the movements of said plungers whereby they operate simultaneously with the intermediate portion of the wrapper engaged between them while the former is entering the mold.

7. In a machine for making up packets of material, the combination of a movable carrier, a set of molds mounted thereon, a corresponding set of formers rotatable with the carrier and movable into and out of the respective molds, means for introducing a wrapper blank successively between each mold and its respective former, means for operating each former to carry a wrapper blank into the corresponding mold, and a pair of alined and opposed plungers reciprocable in a direction transverse to the plane of movement of the molds, one of said plungers being operative through each former, and means for operating the plungers to grip a portion of the wrapper blank between them as the blank is being carried into the mold and for withdrawing the plunger which operates through the former.

8. In a machine for making up packets of material, the combination of a mold, means for introducing a wrapper therein in doubled form, a pair of folders for folding the sides of the wrapper blank, a pair of folders for turning up the lower corners of the wrapper blank upon the side folds, and a reciprocatory member common to and supporting both pairs of said folders and operative to carry them to and from operative relation with the wrapper blank while in the mold.

9. In a machine for making up packets of material, the combination of a mold, means for introducing a wrapper blank therein in folded form, a pair of reciprocatory folders having means for operating them to turn in the sides of the wrapper blank, a pair of pivoted folders having means for operating them to turn up the lower corners of the wrapper blank against the side folds, and a carrier supporting both pairs of folders in coöperative relation and having means for operating it to carry the folders to and from operative position with respect to a wrapper blank in the mold.

10. In a machine of the class described, the combination of a mold, means for introducing a wrapper blank therein in folded condition, a pair of folders having means for operating them to fold the sides of the wrapper blank inwardly, a second pair of folders having means for operating them to fold the bottom corners of the wrapper blank upwardly and against the previously folded sides, a carrier for moving both pairs of folders to and from operative position with respect to a wrapper in said mold, and a pair of opposed and inwardly movable pressers arranged at opposite edges of the mold and operative to fold the remaining side folds of the wrapper blank inwardly.

11. In a machine of the class described,

the combination of means for applying adhesive to a wrapper blank, a movable mold having open sides, means for doubling the wrapper blank, and introducing it into said mold, folders for turning the sides of the wrapper blank inwardly, folders for turning the bottom corners of the wrapper blank upwardly and against the previously folded sides, and pressers operative through the open sides of said mold for turning inwardly the remaining sides of the wrapper blank and operative to retain said sides in shape until the adhesive has set.

12. In a machine of the class described, the combination of a movable mold, means for introducing a wrapper blank in folded condition therein, folders for turning the sides of the wrapper blank inwardly and for turning the lower corners of the wrapper blank upwardly, pressers arranged at opposite sides of the mold for turning the remaining sides of the wrapper blank inwardly and embodying opposed operating members, and a bar extending parallel to the path of movement of the mold and having cam portions thereon coöperative with the operating members of the pressers to cause the latter to move inwardly and operate effectively upon the wrapper blank.

13. In a machine of the class described, the combination of a mold, means for introducing a wrapper blank therein in folded form, folders for turning two sides of the wrapper blank inwardly, folders operative to turn the lower corners of the wrapper blank upwardly, a pair of opposed and inwardly movable pressers mounted at opposite sides of the mold and operative to turn the remaining sides of the wrapper blank inwardly and embodying a pair of operating members, a spring interposed between and operative upon said members to move the pressers inwardly, and a movable bar having cam portions thereon coöperative with said members to control the movements thereof.

14. In a machine of the class described, the combination of a movable carrier, a set of molds thereon the opposite sides of which are open, means for introducing a wrapper blank in folded form into each mold, folders for turning two sides of the wrapper blank inwardly, folders for turning the lower corners of the wrapper blank upwardly, a pair of opposed pressers nonshiftable with respect to the mold carrier and adapted to operate through the open sides of the mold while said carrier is stationary to fold the remaining sides of the wrapper blank inwardly, and a reciprocatory bar provided with cam portions for controlling the movements of the pressers.

15. In a machine of the class described, the combination of a revoluble carrier, a set of molds mounted thereon and having open sides, means for introducing a wrapper blank in folded form to each mold, folders for turning two sides of the wrapper blank inwardly, folders for turning the lower corners of the wrapper blank upwardly, a set of pressers arranged in pairs, said pressers being non-rotatable with respect to the carrier, each pair of pressers being adapted to register with and operate through the open sides of a corresponding mold when properly positioned by the carrier to fold the remaining sides of the wrapper blank inwardly, and a curved reciprocatory bar having cam portions thereon for controlling the movements of said pressers.

16. In a machine of the class described, the combination of a support for positioning a packet thereon and means for closing the top of the packet embodying a pair of arms arranged at the opposite sides of and movable vertically with respect to said support, a reciprocatory cross-head to which said arms are pivoted, a pair of folders pivotally mounted upon the upper ends of said arms, a member operatively connected to said folders and capable of moving simultaneously and also independently with respect to said cross-head, means acting upon said arms for moving the folders inwardly, and means controlled by a relative movement between said cross-head and member for causing inward movement of the folders.

17. In a machine of the class described, the combination of a support for positioning a packet in upright position, a cross-head movable toward and from the support, a pair of arms pivotally connected to the cross-head, folders fulcrumed on said arms, means acting upon said arms to operate the folders, a member capable of movement with and also relatively to said cross-head and operatively connected to the folders to rock them on their fulcrums when relative motion occurs between said member and cross-head, means for reciprocating said member, and means forming a yieldable connection between said member and cross-head.

18. In a machine of the class described, the combination of a support for positioning a packet of material in an upright position, a cross-head movable toward and from said support, a pair of arms pivotally mounted on the cross-head, a pair of folders pivotally mounted upon said arms, a spring operative upon said arms to cause the folder-carrying ends of said arms to approach one another, a yoke also movable toward and from said support, means for reciprocating said yoke, links operatively connecting the yoke to the respective folders, a spring forming a yieldable connection between said yoke and cross-head, and wedges carried by the yoke and operative

upon said arms to cause the folders to turn into operative position when relative motion occurs between said cross-head and yoke.

19. In a machine of the class described, the combination of a movable mold adapted to contain a packet of material and means for folding the upper edges of the wrapper, comprising a pivoted carrier movable tangentially of the path of movement of the mold, a folding blade pivoted on the carrier and movable in the plane of movement of the carrier, means for swinging the carrier to bring the folding blade into operative position and to hold it in such position with respect to the packet, and means for subsequently turning the folding blade while held in such operative position to fold the upper edge of the wrapper.

20. In a machine of the class described, the combination of a mold to contain a packet of material, a channel-shaped packet receptacle, and means for transferring a packet from the mold to said receptacle embodying a fork movable in a direction transversely of the channel-shaped receptacle and adapted when in one position to receive the packet from the mold and when in an opposite position to transfer the packet to said receptacle, and a plunger operative through the fork to remove the packet therefrom and to feed it into said receptacle.

21. In a machine of the class described, the combination of a revoluble carrier provided with a set of molds, each adapted to contain a packet of material, a channel-shaped receptacle adapted to receive the packets from said molds, and a transferring device between the carrier and receptacle embodying a reciprocatory fork movable from a position to receive the packets successively from the molds on the carrier to a position in alinement with said receptacle, and a plunger having means for operating it at each reciprocation of said fork to enter such fork and remove the packet therefrom and introduce it into said receptacle.

22. In a machine of the class described, the combination of a revoluble carrier, a set of molds mounted thereon, means for introducing wrapper blanks successively to the molds on the carrier as the latter rotates, a set of formers also rotatable with the carrier and guided to move into and out of the respective molds, means for supporting the formers during a certain part of the revolution of the carrier embodying a curved track conforming to the path of movement of the molds, said track being interrupted to permit the formers to successively descend into the respective molds to carry the wrapper blanks therein, and an elevator for returning the formers successively to elevated position and in position to be again supported by said track.

23. In a machine of the class described, the combination of a revoluble carrier, a set of molds mounted thereon, a set of formers rotatable with the carrier and movable vertically to and from operative position with respect to the corresponding molds, each former having a supporting roler thereon on also a lifting projection, a curved track coöperative with the supporting roller of each former frame to support the corresponding former in elevated position during a portion of the revolution of the carrier, said track being interrupted to permit the formers to descend successively into the respective molds, and an elevator for returning the formers successively to elevated position, said elevator embodying a grooved member adapted to successively receive the lifting projections on the respective former frames.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY ROSE.

Witnesses:
LUTHER J. PARR,
CHAS. N. DANIELS.