E. D. SMITH.

PACKING MACHINE.

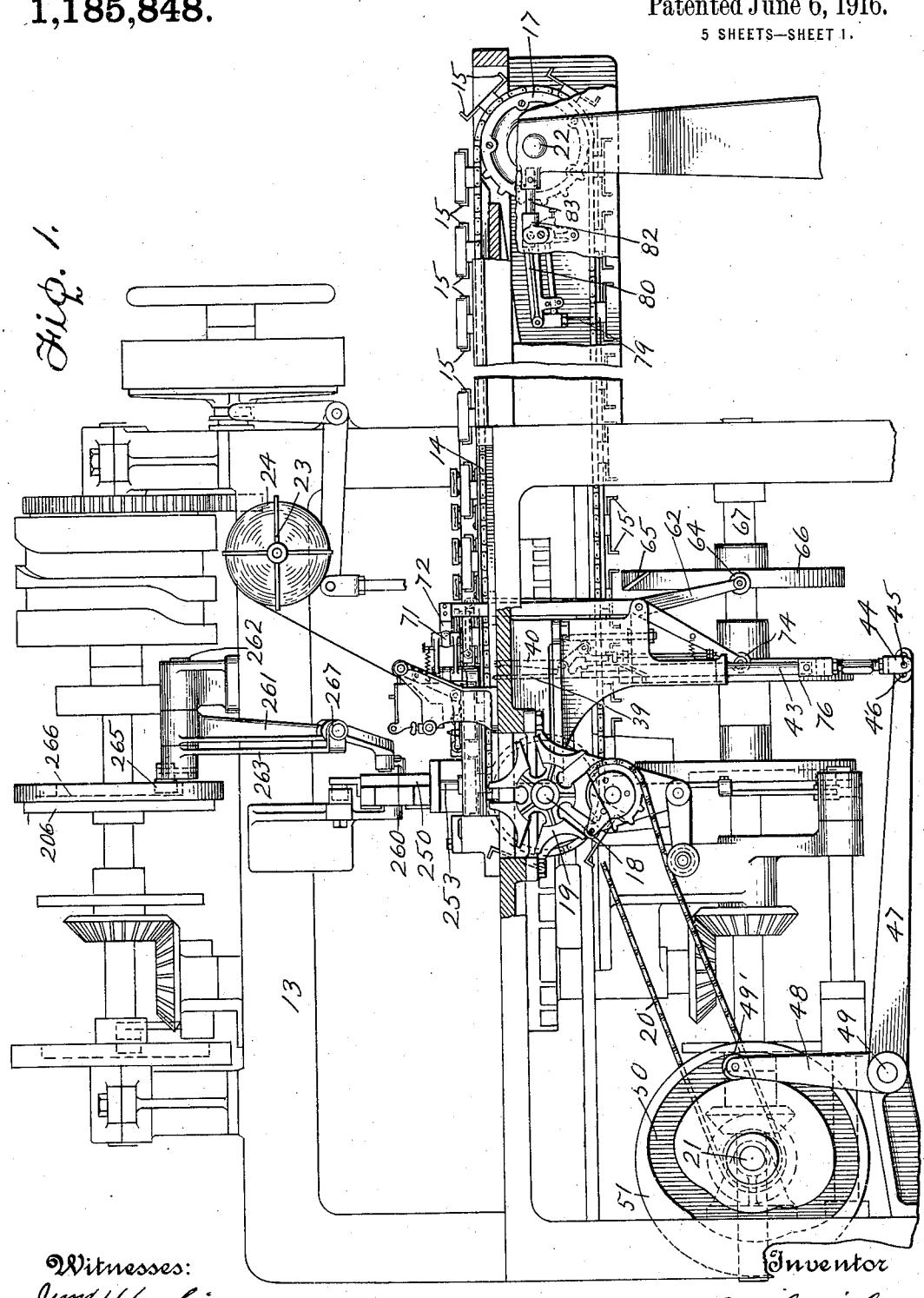
APPLICATION FILED MAR. 15, 1915.

1,185,848.

Patented June 6, 1916.

5 SHEETS—SHEET 1.

Fig. 1.



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5 SHEETS—SHEET 2.

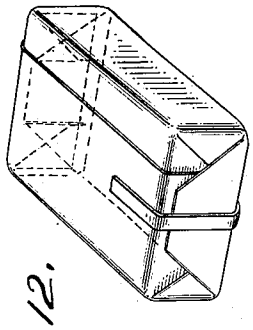


Fig. 12.

Fig. 2.

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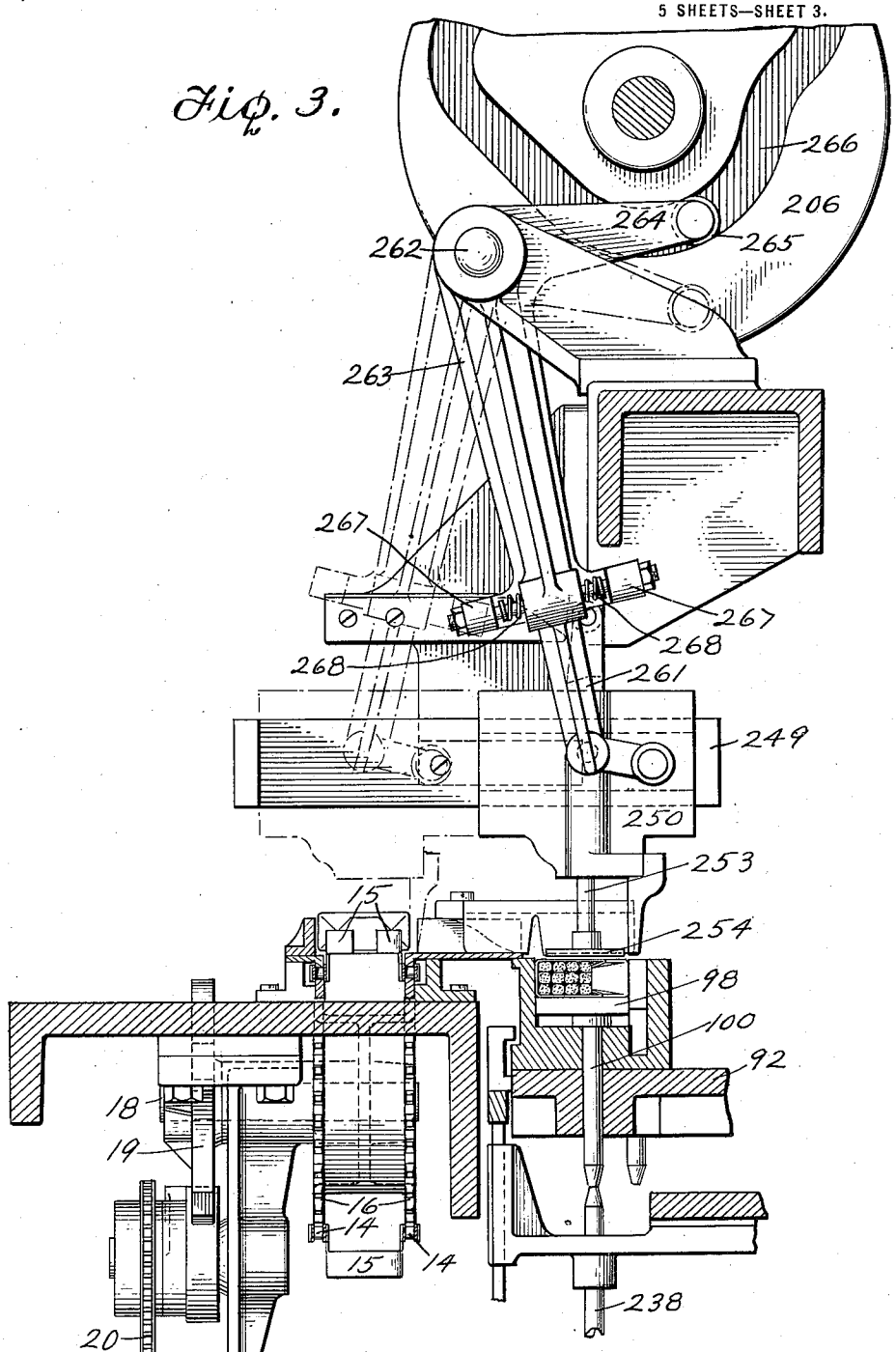
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5 SHEETS—SHEET 3.

Fig. 3.



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1,185,848.

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5 SHEETS—SHEET 4.

Fig. 4.

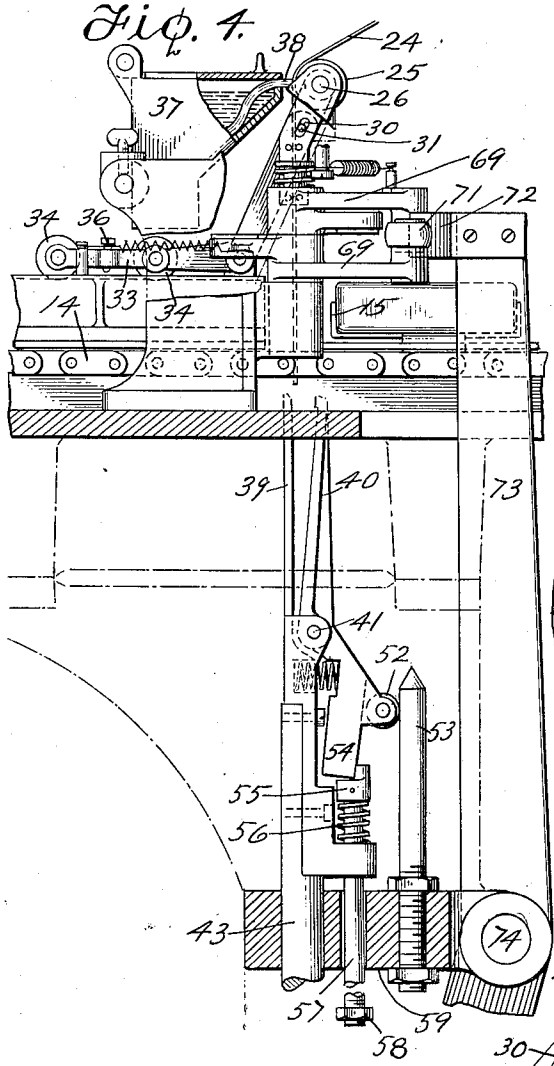


Fig. 5.

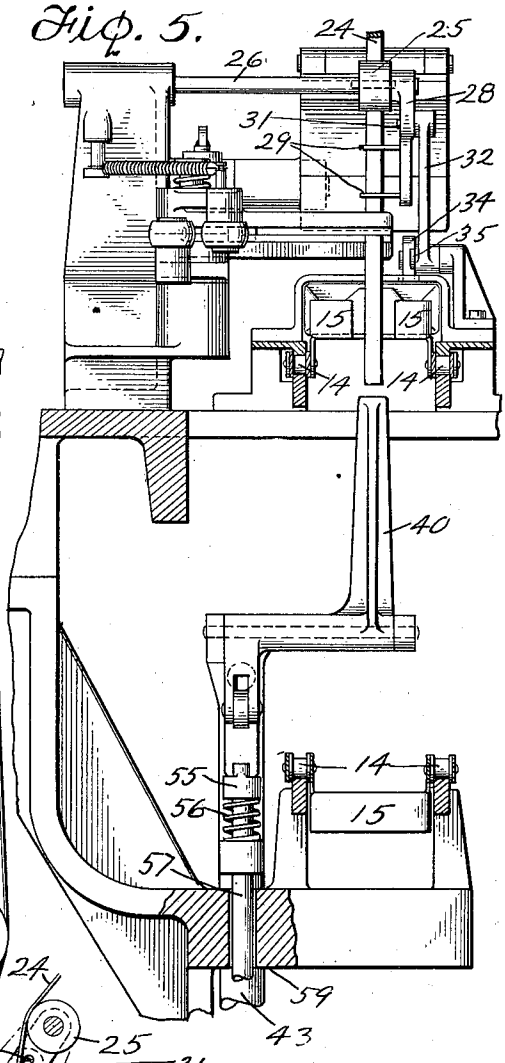
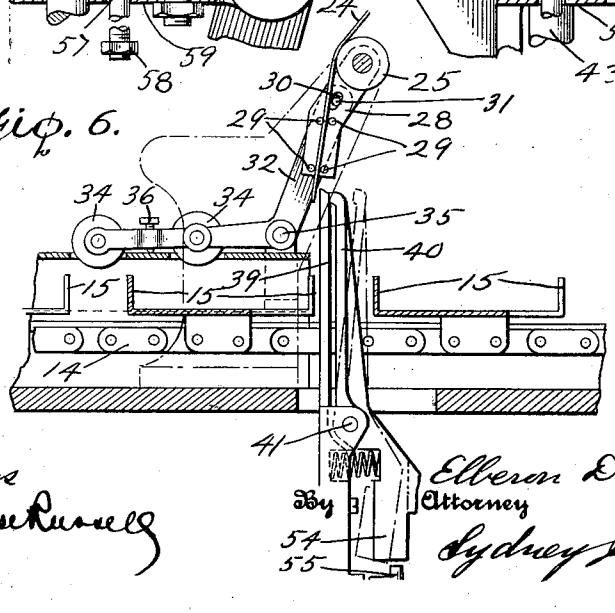


Fig. 6.



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1,185,848.

Patented June 6, 1916.

5 SHEETS—SHEET 5.

Fig. 7.

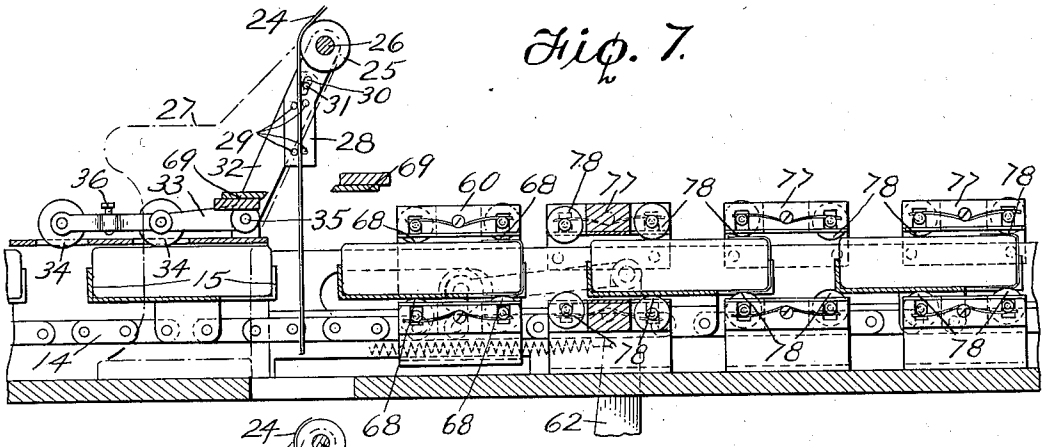


Fig. 8.

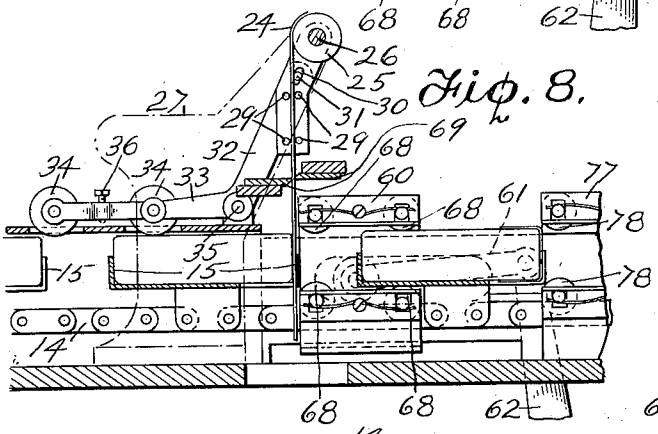


Fig. 9.

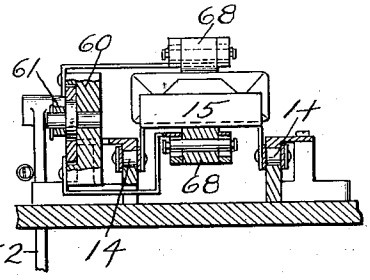


Fig. 10.

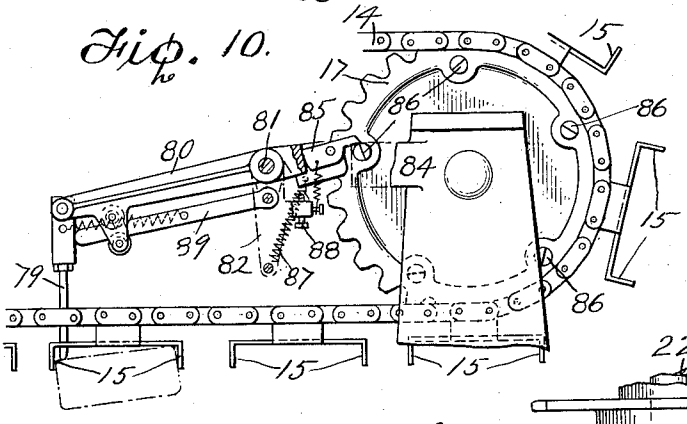
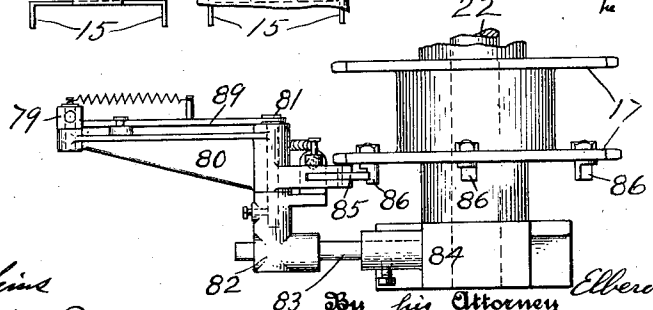


Fig. 11.



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UNITED STATES PATENT OFFICE.

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PACKING-MACHINE.

1,185,848. Specification of Letters Patent. Patented June 6, 1916.

Application filed March 15, 1915. Serial No. 14,341.

To all whom it may concern:

Be it known that I, ELBERON D. SMITH, a citizen of the United States, residing at Brooklyn, county of Kings, and State of New York, have invented a new and useful Improvement in Packing-Machines, of which the following is a specification.

This invention relates to an improvement in packing machines.

In the Patent No. 1114053, granted October 20, 1914, to American Machine & Foundry Company as the assignee of Elberon D. Smith, there is disclosed a machine for packing cigarettes which includes mechanism for assembling a series of cigarettes, for wrapping the assembled series in tinfoil or other suitable wrapping material, and for finally inserting the wrapped package in a pouch. Although the present invention is capable of use in packing articles other than cigarettes, it is designed to be used in connection with the machine shown in the patent above referred to, the major portion of said machine being used in carrying the present invention into effect. Instead, however, of inserting a wrapped package in a pouch, the present invention contemplates the banding of the package; that is to say, the application of a sealing band to one end of the package, which may or may not thereafter be inserted in a pouch. The present invention, therefore, relates to an attachment for machines of the general character disclosed in the above patent, and further relates to other types of packing machines in which a package of any kind is banded.

The invention consists in certain parts, constructions and combinations which will be hereinafter fully described and then specifically set forth in the claims hereunto appended.

In the accompanying drawings, which form a part of this specification and in which like characters of reference indicate the same or like parts, Figure 1 is a view in elevation, partly broken away and partly diagrammatic, illustrating a device constructed in accordance with the invention. Fig. 2 is a plan view, partly broken away and partly diagrammatic, of the structure shown in Fig. 1. Fig. 3 is a detail view, on an enlarged scale, of the means for transferring a wrapped article from the wrapping mechanism to the banding mechanism. Figs. 4 and 5 are respectively side elevation and end elevation, partly broken away, of means for positioning a band across the path of movement of the articles. Fig. 6 is a detail view showing some of these parts in a different position. Figs. 7, 8 and 9 are detail views showing the operation of the means for applying bands to the articles. Figs. 10 and 11 are respectively side elevation and plan view of ejecting mechanism for ejecting articles from the forwarding means. And Fig. 12 is a perspective view of a package showing the band as applied.

In carrying the invention into effect there is provided means for folding a sheet of wrapping material about an article, forwarding means for the wrapped article provided with devices for holding the folds of wrapping material against the article, means for transferring the wrapped article from the folding means to the forwarding means, and means for applying a band to the wrapped article while in the forwarding means. In the best constructions the means for applying a band to the wrapped article includes means for moving a strip of band material into the path of movement of an article in the forwarding means, means for severing an individual band from said strip, and means for applying the individual band to the wrapped article while in the forwarding means. In the best constructions also an ejector is provided which coöperates with the forwarding means and is normally out of action because unnecessary, but which comes into action whenever a wrapped article passes the banding means without having a band applied thereto. In the best constructions also, the band is caused to become adhesive just prior to its application to a wrapped article. In the best constructions also, there is provided a conveyer provided with spaced devices consisting of rigid clips for supporting the article and holding the folds of wrapping material against said article. In the best constructions also, there is provided a conveyer provided with spaced devices for supporting and advancing articles and means controlled by the articles for successively positioning the bands ahead of articles in said devices, and means for thereafter folding the bands about the ends of the articles.

The particular structure selected to illustrate the invention is but one of many pos-

sible concrete embodiments of the same and the invention, therefore, is not to be restricted to the precise details of the structure shown and described. Furthermore, certain parts of the invention are capable of use independent of other parts, and such independent use is contemplated.

Referring to the drawings, 13 indicates diagrammatically and generally a mechanism for folding a sheet of wrapping material about an article, this mechanism being substantially like that shown in Patent No. 1114053 above referred to, and since the particular construction of this part of the device is foreign to the present invention, reference is made to the above mentioned patent for a full disclosure thereof and a detailed description of the same is omitted herefrom in the interest of brevity and clearness. This folding mechanism, however, includes means for transferring a wrapped article from the folding means to a separate forwarding means which is substantially like the mechanism for performing a similar function disclosed in the above mentioned patent; that is to say, a cam disk 206 provided with a cam groove 266 is employed and in this cam groove runs a bowl 265 mounted upon the arm 264 of a two-arm lever 263—264, which is fulcrumed at 262 to a bracket rising from the main frame of the machine. The arm 263 is provided with a T-head having bosses 267. Pivotally mounted at the fulcrum 262 is a lever 261 which lies between the bosses 267. Springs 268 are provided which lie between the bosses 267 and the lever 261. The free end of the lever is connected, by means of a link 260, to a carriage 250 adapted to reciprocate upon a slide 249. The carriage 250 is provided with a plunger 253 and plate 254 adapted to rest upon a wrapped article lying upon a vertical reciprocatory table 98 having a stem 100 working in an article pocket carried by a turret 92. A plunger 238 is provided, which contacts with the lower end of the plunger 100 and is adapted, at the proper time, to raise the article from the turret pocket into position to be transferred by the carriage 250. In view of the disclosure in the patent above referred to, a further description of this part of the mechanism is deemed unnecessary and is omitted in the interest of brevity and clearness.

There is provided forwarding means for the wrapped article provided with devices for holding the folds of wrapping material against the article. As shown, this forwarding means consists of a flexible conveyer made up of two chains 14 provided with rigid clips 15 riveted or otherwise secured to said chains. The chains 14 run over suitable sprockets 16 and 17. The sprocket 16 is fast upon a shaft 18 mounted in suitable bearings in a bracket rising from the main frame of the machine; and upon the outer end of the shaft 18 is mounted a mechanism 19 known to mechanics as a "Geneva movement", the function of this Geneva movement being to convert continuous rotary motion into intermittent motion. This Geneva movement mechanism is driven by means of a chain 20 deriving its motion from a continuously operating shaft 21 mounted in suitable bearings in the main frame of the machine. The sprocket 17 is loosely mounted upon the shaft 22, which shaft is suitably mounted in bearings in a bracket rising from the main frame of the machine. By an inspection of Figs. 2 and 3, it will be readily understood that the wrapped article is transferred from its position in the turret 92 by a movement of the carriage 250 at right angles to the line of movement of the upper run of the chains 14 which is the operating run of the same, and it will be readily recognized that the end folds of the wrapping material about the article are by this movement brought into contact with the adjacent faces of the clips 15 carried by the conveyer, and that the clips hold the folds of material against the wrapped article during the forwarding action of the conveyer.

After the wrapped article has been transferred to the conveyer with the clips 15 holding the end folds in position against the article, it is desired that a band be applied to the forward end of the article which will operate to finally hold the end fold of the wrapping material against the article and seal the package. With this end in view, there is provided a reel 23 carrying a coiled strip of band material indicated at 24 (see Fig. 1). The strip of band material 24 is led over a guiding roller 25 (see Figs. 4, 5, 7 and 8) journaled upon a stud 26, which stud is secured in a bracket 27 rising from the main frame of the machine. Upon the end of the stud 26 is journaled an arm 28 carrying guiding pins 29 between which the strip of band material is led. The arm 28 is further provided with a slot 30 engaged by a pin 31 which is fast in one end of a two-arm lever 32—33. The other arm of this lever carries a pair of bowls 34. The lever 32—33 is fulcrumed at 35 upon a pin suitably supported by the frame of the machine. The bowls 34 lie in the path of movement of wrapped articles advanced by the forwarding means and are adapted to roll upon the upper surface of the articles as they pass beneath the bowls. The weight of the arm 33 is greater than the weight of the arm 32 and the tendency, therefore, is for the arm 33 to drop so that the bowls would, in the absence of an article in the conveyer, drop below the plane of the upper surface of articles in the forward-

ing means. This movement is limited by means of an adjusting set screw 36, and the action just described is clearly illustrated in Fig. 6, in which no wrapped article is shown in the conveyer. By an inspection of Fig. 6, it will be readily understood that when there is no article on the conveyer below the bowls 34, the lever 32—33 will be swung out of normal position, and in so doing will swing the arm 28 out of normal position. The object of this will be presently explained.

Means are provided for causing the strip of band material to become adhesive. In the machine shown, the strip of band material is gummed and the gum on the strip is moistened just before it is positioned ahead of an article in the conveyer. To effect this result there is provided a water reservoir 37 carrying a wick 38 (see Fig. 4), the end of which contacts with the strip of band material as it passes over the guide roller 25. This wick derives moisture from the reservoir 37 and causes the strip of band material to become adhesive. For the purpose of positioning the band material ahead of a wrapped article advanced by the forwarding means, there is provided a clip consisting of a fixed jaw 39 and a movable jaw 40 pivotally connected at 41 and normally held in closed position by means of a spring 42. The jaw 39 is screwed to a rod 43 sliding vertically in suitable bearings in the main frame of the machine. The lower end of the rod 43 is provided with a fork 44 carrying a pin 45 (see Fig. 1), which pin operates in a slot 46 located in one end of a bell-crank lever 47—48, which lever is fulcrumed at 49 to a bracket extending from the main frame of the machine. The arm 48 of the bell-crank lever 47—48 carries a bowl 49′ engaging a cam slot 50 cut in a cam disk 51 mounted upon the shaft 21 before referred to.

The jaw 40 carries a bowl 52 adapted to ride against a cam post 53 adjustably mounted in the main frame of the machine. This bowl 53 contacts with the cam post only at the lower end of the movement of the rod 43 and operates to open the jaws. When the jaws are so opened, the tail 54 of the jaw 40 is engaged by a latch 55 which is held in engaging position by means of a coiled spring 56, the construction of which is clearly shown in Fig. 4. The latch 55 is pinned to the upper end of a rod 57 carrying at its lower end an adjusting nut 58. By an inspection of Fig. 4, it will be readily understood that during the upward movement of the rod 43, the jaws will be held open by the latch 55, and this open position is maintained until the adjusting nut 58 comes in contact with the abutment 59 formed by the main frame of the machine. The rod 57, and consequently the latch 55, will then be stopped, while the rod 43 will continue its upward movement. This results in unlatching the jaw 40 and permitting the spring to close the clip. This position of closure is clearly shown in Fig. 6. If there is a wrapped article in the conveyer between the clips immediately behind the band positioning clips, the strip of band material will be in position to be seized by the jaws 39—40; but if, as illustrated in Fig. 6, there is no wrapped article in position to be banded, the strip of band material is swung out of the way so that the jaws 39—40 do not seize the end of the band, and consequently will not upon their return movement pull the band down into position. The position of the band after the jaws 39—40 have acted to pull it down, is clearly shown in Figs. 7 and 8.

Before the band material can be applied to a wrapped article held in the forwarding means, an individual band must be severed from the strip; and before an individual band can be severed from the strip, the strip must be held against the forward end of a wrapped article to prevent it from falling. To effect this result, there is provided a traveling folding device consisting of a carriage 60 (see Figs. 7, 8 and 9) which has a reciprocatory movement. This reciprocatory movement is effected by means of a link 61 which connects the carriage 60 with a cam lever 62. This cam lever is fulcrumed at 63 to a bracket suitably supported from the main frame of the machine. The cam lever 62 carries a bowl 64 adapted for engagement at the proper time with a cam 65 located upon the periphery of a cam disk 66 carried by a shaft 67 which is one of the main cam shafts of the machine. This cam mechanism is timed to give the carriage 60 a backward movement toward the strip of band material immediately after the band pulling jaws 39 and 40 have retreated and let go of the strip of band material and just as the conveyer begins its forward movement. The positions in which these parts lie immediately after the jaws 39—40 have released the band material is shown in Fig. 7, while Fig. 8 shows the wrapped article advanced and the carriage 60 retreated to cause the strip of band material to contact with the forward end of the wrapped article. The carriage 60 is provided with spring pressed rolls 68 which contact with the top and bottom of articles advanced by the forwarding means. As soon as the parts reach the position shown in Fig. 8, the strip of band material will adhere to the forward end of an article immediately behind the band. A device for severing an individual band from the strip then comes into action. This device consists of a pair of shears 69 (see Figs. 1, 7 and 8). These shears are pivoted together at 70 and each carry bowls

71 adapted to be engaged by a cam block 72. The cam block 72 is mounted upon a cam lever 73 which is fulcrumed at 63. The lower end of this cam lever carries a bowl 74 adapted for intermittent contact with a suitable cam 75 mounted upon the periphery of a cam disk 76 carried by the shaft 67 before referred to. It will be readily understood that the cam 75 is so timed as to cause the shears 69 to operate and sever an individual band from the strip immediately after the parts have reached the position shown in Fig. 8.

An individual band having now been caused to adhere to the forward end of a wrapped article and to be severed from the main strip, its projecting ends are to be folded down upon the wrapped article. This is accomplished partly by the rolls 68 carried by the carriage 60 and by a series of similar stationary folding devices 77 (see Figs. 1 and 7), each carrying spring pressed rollers 78, two in each instance contacting with the upper surface of the wrapped articles and two with the lower surface. It will be readily understood that when the carriage 60 has performed its band holding function just prior to the operation of the shears, it is caused—by its controlling cam—to return to normal position. During this return movement and after its return, it performs the function of folding down the upstanding end of the individual band upon the wrapped article and of folding up the depending end of the band upon the bottom of the wrapped article. It will be readily understood also that in the event of the absence of a wrapped article, and consequently in the absence of a band, the carriage has the same movements as under normal conditions but is without effect.

After the banded article has passed through the folding device 77, it is carried around the sprocket 17 and normally falls into a suitable receptacle. If for any accidental reason a wrapped article goes through the machine without having a band applied thereto, the natural resiliency of the end folds of the wrapping material between the clips 15 might cause it to remain in the clips and be carried around to article receiving position, where it would interfere with the operation of the machine. To guard against this possibility an ejector mechanism is provided which is normally inactive; it is active only, as above indicated, when an article does not fall from the conveyer as it should under normal conditions. This ejector consists of a plunger 79 (see Figs. 10 and 11) pivoted to a lever 80. This lever is fulcrumed upon a stud 81 carried by a bracket 82 adjustably mounted on a bar 83 supported by a bracket 84 rising from the main frame of the machine. The lever 80 is provided with a slot in which is mounted a spring pawl 85 engaged by studs 86 carried by the sprocket 17 before referred to. In Fig. 10, the plunger is shown in ejecting position. It is returned to normal position out of the path of movement of the conveyer by means of a spring 87 connecting the lever 80 with the bracket 82, the movement being limited by means of an adjusting screw 88. The plunger 79 is given a parallel movement by means of a well known paralleling mechanism 89. Although this ejecting mechanism comes into operation every time a clip passes it, it is normally inoperative because under normal conditions there will be no wrapped article in the clip at the position in which the ejector operates.

In view of the foregoing, a more detailed description of the operation of the device is deemed unnecessary and is therefore omitted in the interest of brevity.

What is claimed is:

1. In a packing machine, the combination with a conveyer provided with spaced devices for supporting articles, of means for moving a strip of band material across the path of movement of the articles between two adjacent devices, and means controlled by the articles for causing the band moving means to become operative only when there is an article in the device immediately behind said moving means.

2. In a packing machine, the combination with a flexible conveyer provided with spaced rigid clips for supporting wrapped articles and holding the folds of wrapping material against said articles, of means for moving a strip of band material across the path of movement of the articles between two adjacent clips, and means controlled by the articles for causing the band moving means to become operative only when there is an article in the clip immediately behind said moving means.

3. In a packing machine, the combination with a conveyer provided with spaced devices for supporting articles, of means for moving a strip of band material across the path of movement of the articles between two adjacent devices, a band guide, and means controlled by the articles for moving the band guide to cause the band moving means to become operative only when there is an article in the device immediately behind said moving means.

4. In a packing machine, the combination with a conveyer provided with spaced devices for supporting articles, of means for moving a strip of band material across the path of movement of the articles between two adjacent devices, a swingable band guide, and means controlled by the articles for swinging the guide to cause the band moving means to become operative only

when there is an article in the device immediately behind said moving means.

5. In a packing machine, the combination with a conveyer provided with spaced devices for supporting articles, of means for moving a strip of band material across the path of movement of the articles between two adjacent devices, a swingable band guide, and a coöperating two-arm lever one arm of which engages said swingable guide and the other arm of which is provided with a roller adapted to contact with the articles and for causing the band moving means to become operative only when there is an article in the device immediately behind said moving means.

6. In a packing machine, the combination with a conveyer provided with spaced devices for supporting articles, of a reciprocating clip and operative connections for moving a strip of band material across the path of movement of articles between two adjacent devices, and means controlled by the articles for causing the band moving clip to become operative only when there is an article in the device immediately behind said moving clip.

7. In a packing machine, the combination with a conveyer provided with spaced devices for supporting articles, of a cam controlled clip for moving a strip of band material across the path of movement of the article between two adjacent devices, means for closing the clip at one limit of its movement and for opening the clip at the other limit of its movement, and means controlled by the articles for causing the band moving clip to become operative only when there is an article in the device immediately behind said moving clip.

8. In a packing machine, the combination with a conveyer provided with spaced devices for supporting articles, of a cam controlled reciprocating clip for moving a strip of band-material across the path of movement of the articles between two adjacent devices, a trip mechanism for causing the clip to close at one end of its movement, a stationary cam device for causing the clip to open at the other end of its movement, and means controlled by the articles for causing the band moving clip to become operative only when there is an article in the device immediately behind said moving clip.

9. In a packing machine, the combination with a conveyer provided with spaced devices for supporting articles, of means for moving a strip of band material across the path of movement of the articles between two adjacent devices, means for severing an individual band from the strip after the latter has been moved across the path of movement of the articles, and means controlled by the articles for causing the band moving means and severing means to become operative only when there is an article in the device immediately behind said moving means.

10. In a packing machine, the combination with a conveyer provided with spaced devices for supporting articles, of means for moving a strip of band material across the path of movement of the articles between two adjacent devices, shears for severing an individual band from the strip after the latter has been moved across the path of movement of the articles, and means controlled by the articles for causing the band moving means and shears to become operative only when there is an article in the device immediately behind said moving means.

11. In a packing machine, the combination with a conveyer provided with spaced devices for supporting articles, of means for moving a strip of band material across the path of movement of the articles between two adjacent devices, cam operated shears for severing an individual band from the strip after the latter has been moved across the path of movement of the articles, and means controlled by the articles for causing the band moving means and shears to become operative only when there is an article in the device immediately behind said moving means.

12. In a packing machine, the combination with a conveyer provided with spaced devices for supporting articles, of means for moving a strip of band material across the path of movement of the articles between two adjacent devices, means for severing an individual band from the strip after the latter has been moved across the path of movement of the articles, means for folding the individual band around one end of an article, and means controlled by the articles for causing the band moving means and severing means to become operative only when there is an article in the device immediately behind said moving means.

13. In a packing machine, the combination with a conveyer provided with spaced devices for supporting articles, of means for moving a strip of band material across the path of movement of the articles between two adjacent devices, means for holding the strip in position against the forward end of an article in the device immediately behind the band moving means, means for thereafter severing an individual band from the strip, and means for thereafter folding the individual band about the forward end of the article.

14. In a packing machine, the combination with a conveyer provided with spaced devices for supporting articles, of means for moving a strip of band material across the path of movement of the articles between two adjacent devices, movable means

for holding the strip against the forward end of an article as the article is advanced by the conveyer, means for immediately thereafter severing an individual band from the strip, and means for thereafter folding the individual band about the end of the article.

15. In a packing machine, the combination with a conveyer provided with spaced devices for supporting articles, of means for moving a strip of band material across the path of movement of the articles between two adjacent devices, reciprocating pressure devices adapted to hold the strip against the forward end of an article as the same is advanced by the conveyer, means for immediately thereafter severing an individual band from the strip, said holding means operating thereafter to fold the individual band about the end of the article, and additional pressure devices for pressing the band firmly against the article as it is further advanced by the conveyer.

16. In a packing machine, the combination with a conveyer provided with spaced devices for supporting articles, of means for moving a strip of band material across the path of movement of the articles between two adjacent devices, reciprocating pressure devices adapted to hold the strip against the forward end of an article as the same is advanced by the conveyer, means for immediately thereafter severing an individual band from the strip, said holding means operating thereafter to fold the individual band about the end of the article, and additional stationary pressure devices for pressing the band firmly against the article as it is further advanced by the conveyer.

17. In a packing machine, the combination with a conveyer comprising a pair of endless chains and a series of rigid clips spaced apart and each adapted to support and forward a wrapped article with the folds of wrapping material held firmly against the article, of means for moving a strip of band material across the path of movement of the articles ahead only of each clip containing an article, means for severing an individual band from the strip, and means for thereafter folding said band about the end of the article.

18. In a packing machine, the combination with a conveyer comprising a pair of endless chains and a series of rigid clips spaced apart and each adapted to support and forward a wrapped article with the folds of wrapping material held firmly against the article, of means for moving a strip of band material across the path of movement of the articles ahead only of each clip containing an article, means for severing an individual band from the strip, means for thereafter folding said band about the end of the article, and an ejector for removing articles from the clips.

19. In a packing machine, the combination with a conveyer comprising a pair of endless chains provided with a series of rigid clips spaced apart and each adapted to support a wrapped article and to hold the folds of the wrapping material closely against said article, means for moving a strip of band material across the path of movement of the article ahead only of each clip containing an article, means for holding the strip in position against the forward end of an article, means for immediately thereafter severing an individual band from the strip, and means for thereafter folding the individual band about the end of the article.

20. In a tobacco packing machine, the combination with a conveyer comprising a pair of endless chains and a series of rigid clips spaced apart and each adapted to support and forward a wrapped article with the folds of wrapping material held firmly against the article, of means for moving a strip of band material across the path of movement of the articles ahead only of each clip containing an article, means for severing an individual band from the strip, means for thereafter folding said band about the end of the article, and means for preventing an article in the forwarding means from interfering with the transfer of another article from the folding means to the forwarding means.

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

ELBERON D. SMITH.

Witnesses:

JAMES A. MCCANN,

SYDNEY P. PRESCOTT.