E. D. SMITH.

CIGARETTE PACKAGING MACHINE.

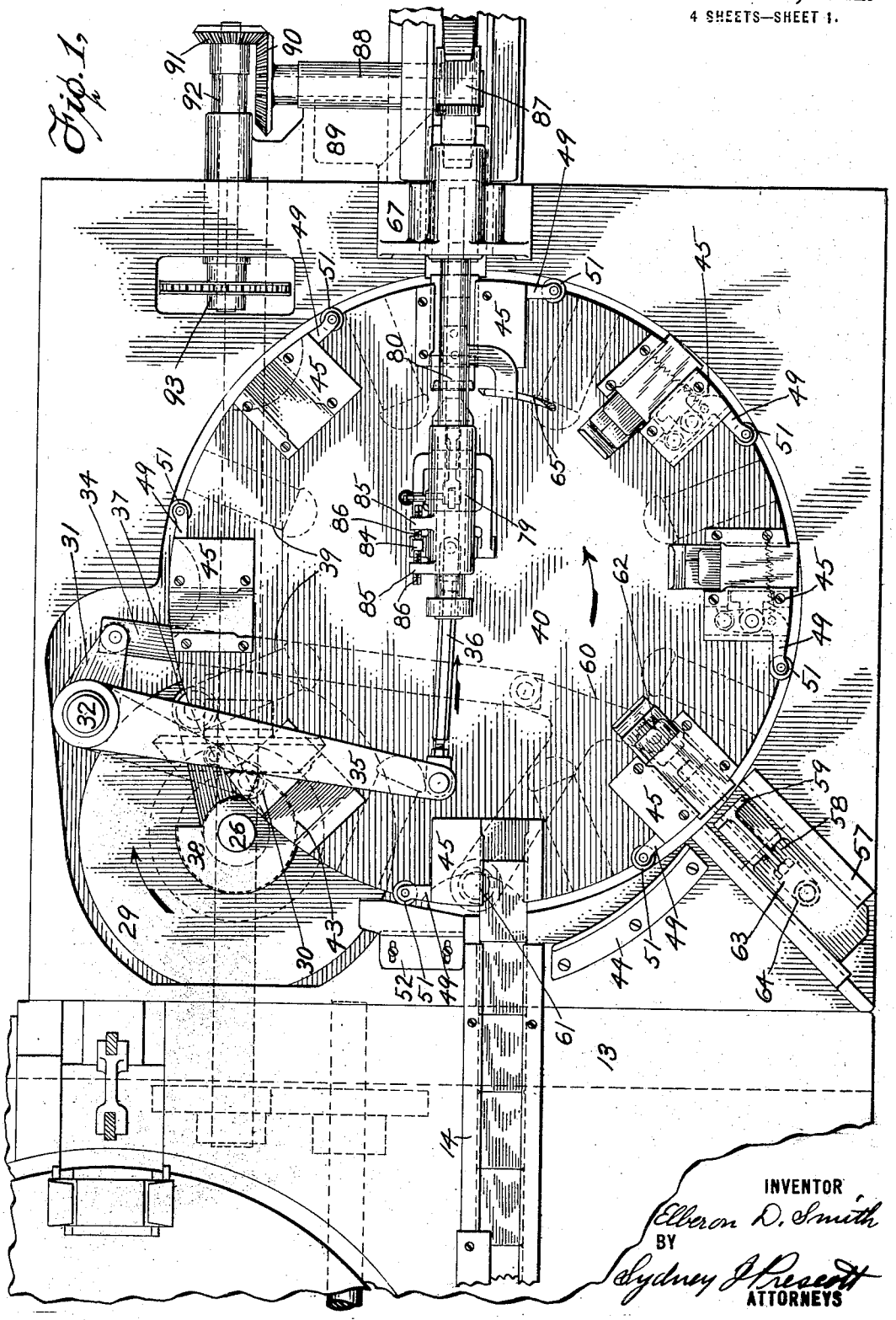
APPLICATION FILED SEPT. 25, 1920.

1,397,552.

Patented Nov. 22, 1921.

4 SHEETS—SHEET 1.

Fig. 1.



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4 SHEETS—SHEET 2.

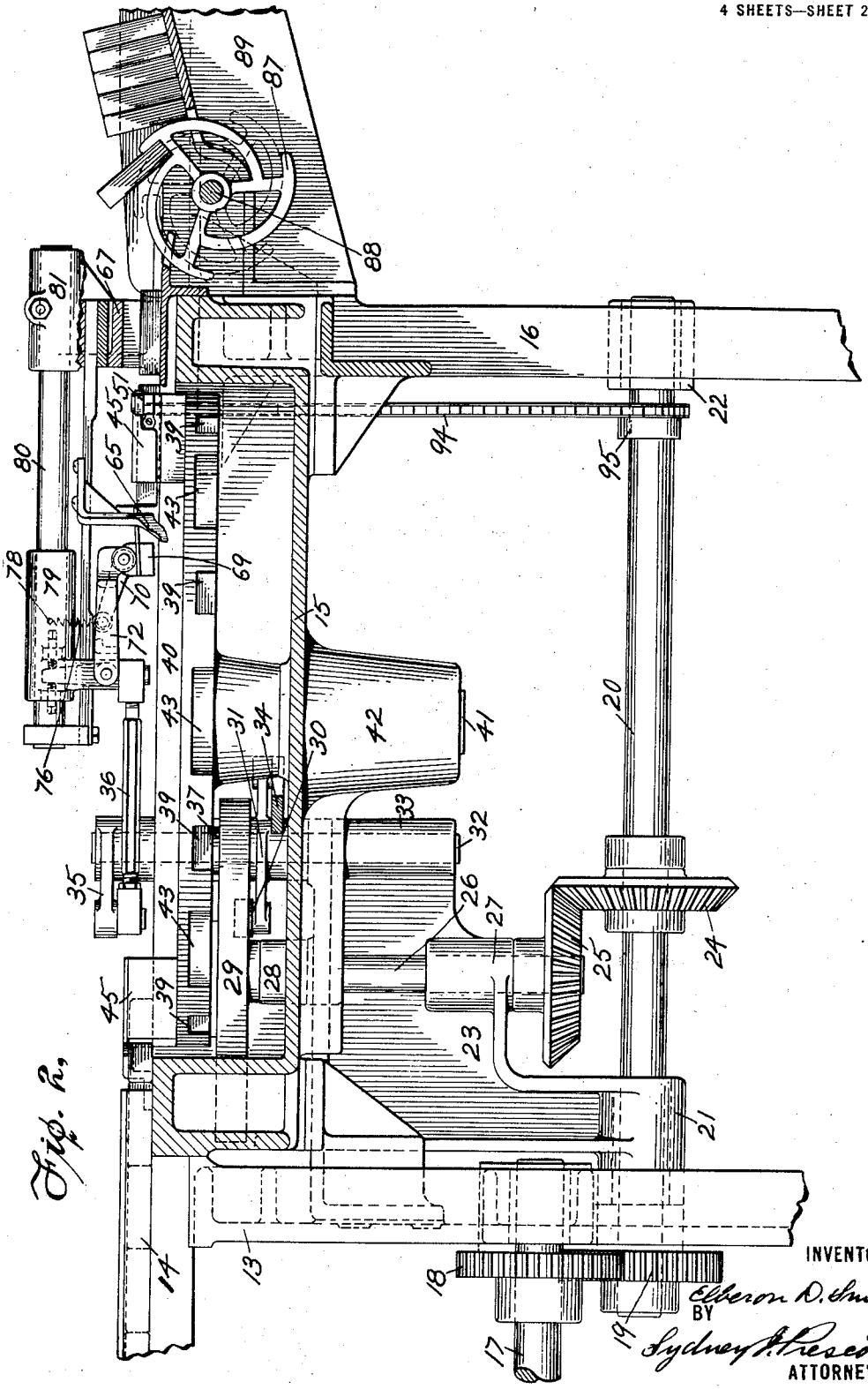


Fig. 2.

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Fig. 4,

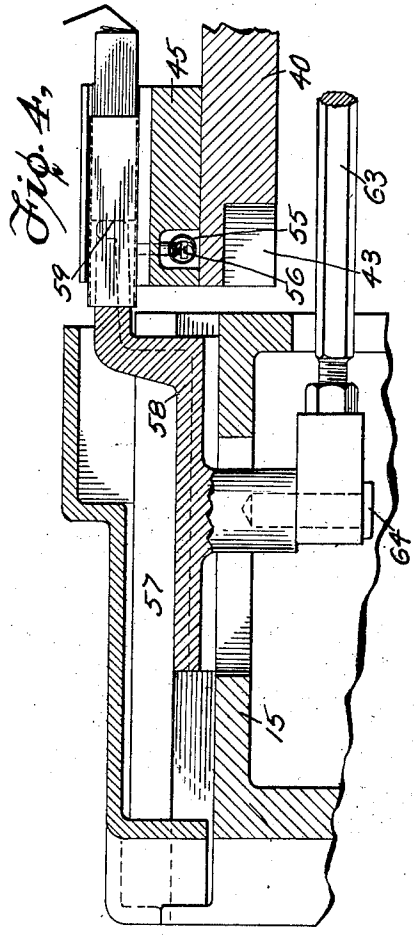


Fig. 7,

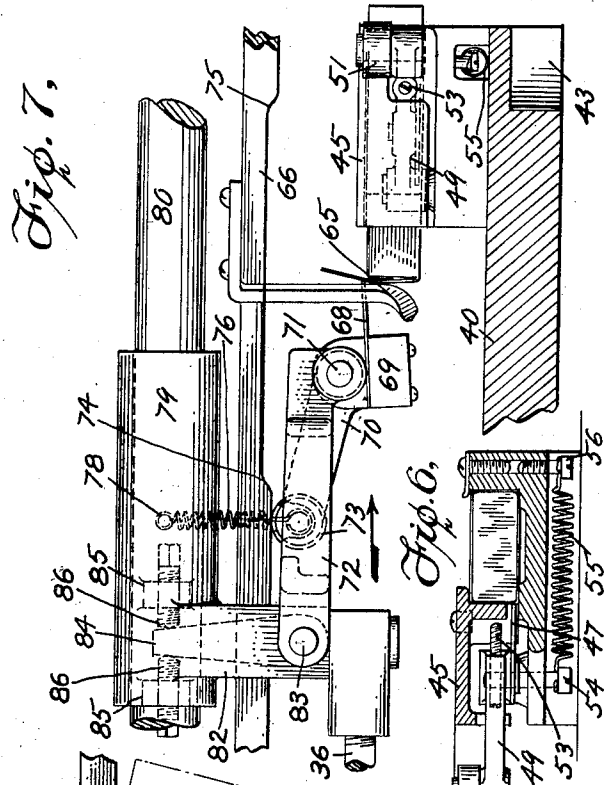


Fig. 6,

Fig. 5,

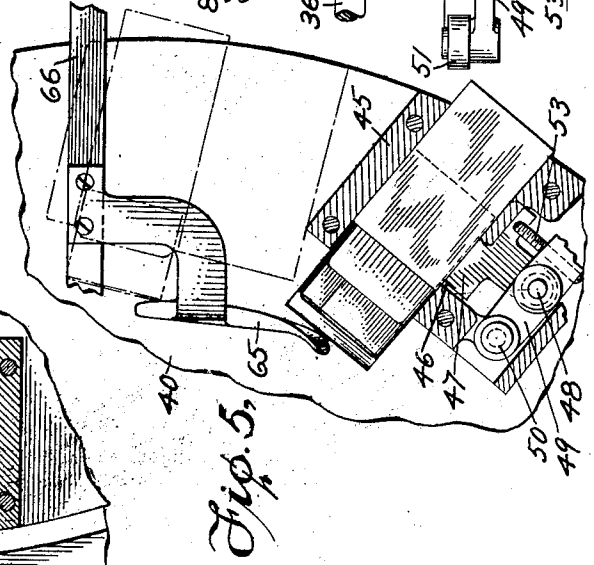
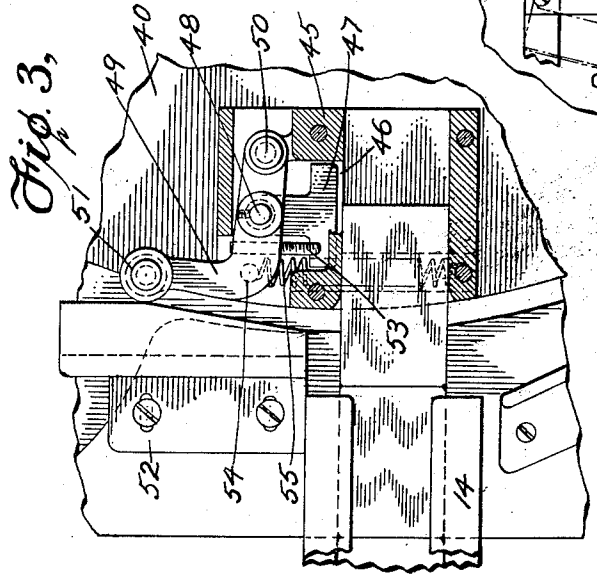


Fig. 3,



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4 SHEETS—SHEET 4.

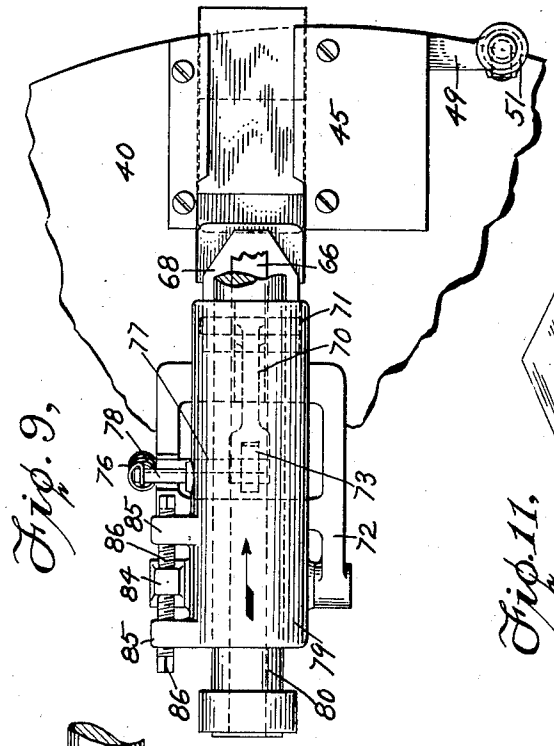


Fig. 9,

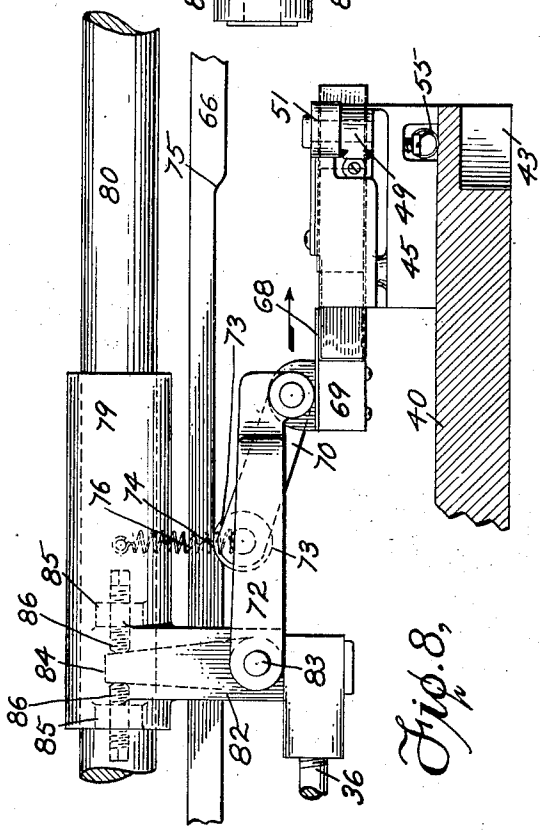


Fig. 8,

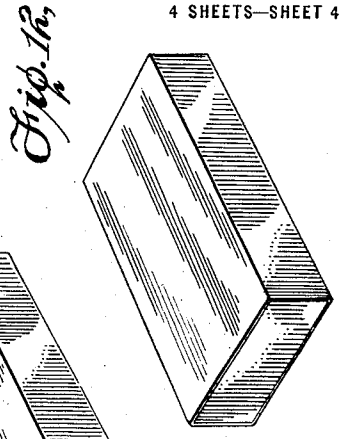


Fig. 12,

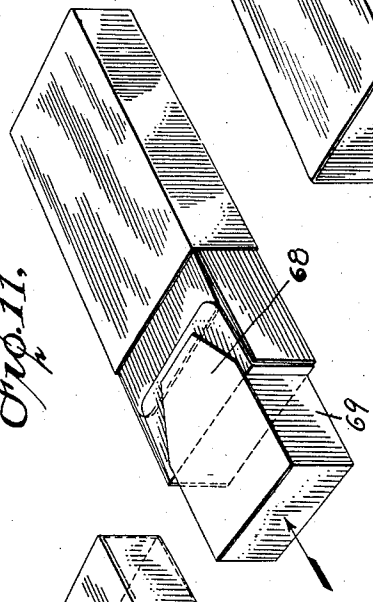


Fig. 11,

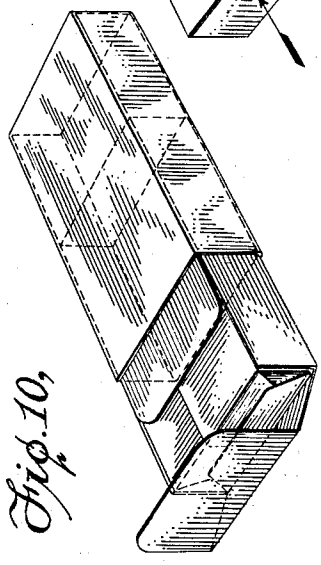


Fig. 10,

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ELBERON D. SMITH, OF BROOKLYN, NEW YORK, ASSIGNOR TO AMERICAN MACHINE & FOUNDRY COMPANY, A CORPORATION OF NEW JERSEY.

CIGARETTE-PACKAGING MACHINE.

REISSUED

1,397,552. Specification of Letters Patent. Patented Nov. 22, 1921.

Application filed September 25, 1920. Serial No. 412,792.

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 Cigarette-Packaging Machines, of which the following is a specification.

This invention relates to a cigarette packaging machine of the general type disclosed in my Patent No. 1201370, granted October 17, 1916. In that machine a definite number of cigarettes is inclosed in a wrapper usually of tinfoil, and the inclosed cigarettes are then inserted in the well known cigarette slide and shell, the whole package being delivered from the machine in closed condition. Some of the users of these machines desire to inspect the package after it has been closed for the purpose of discovering and rejecting any packages not containing the correct number of cigarettes or any packages the foil wrapper of which has been wrinkled or otherwise damaged during the operation of the machine. Heretofore, it has been necessary to open the packages by hand for this purpose. The main object of the present invention is the production of a device which may be attached to cigarette packaging machines already in existence, or inbuilt with such machines built in the future, for automatically opening the packages for inspection and for reclosing them. With this and other objects not specifically mentioned in view, the invention consists in certain constructions and combinations which will be hereinafter fully described and then specifically pointed out 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 plan view of a device constructed in accordance with the invention; Fig. 2 is a sectional view in side elevation of the structure shown in Fig. 1; Fig. 3 is a detail plan view, partly in section, of a device for holding a package against displacement while the same is being opened, and showing said device as out of action; Fig. 4 is a detail sectional elevation of a device for opening the packages; Fig. 5 is a detail plan view, partly in section, showing the package holding device as in action, and also showing a part of the reclosing device; Fig. 6 is a detail cross-sectional view of the package holding device; Figs. 7 and 8 are side elevations, partly in section, of the reclosing and ejecting device, showing the same at two stages of its operation; Fig. 9 is a plan view of the device shown in Figs. 7 and 8 in the position shown in Fig. 8; Fig. 10 illustrates a package as it appears after the opening device has completed its work to prepare it for inspection; Fig. 11 illustrates a package and also diagrammatically illustrates the operating member of the reclosing and ejecting device in the position in which it appears in Figs. 8 and 9; and Fig. 12 illustrates the package after it has been reclosed and ejected.

In carrying the invention into effect, there is provided means for supporting a package, and means engaging and opening said package for inspection in said supporting means. In the best constructions, there is also provided means for delivering a closed package to said supporting means, means for holding said package against displacement during the opening operation, means for intermittently moving the supporting means to advance the opened package to a convenient position for inspection and beyond said position, means for reclosing and ejecting the inspected packages at the advanced position, and means for stacking the reclosed packages. All of the above mentioned means, when used, may be widely varied in construction within the scope of the claims. The particular structure selected to illustrate the invention is but one of many possible concrete embodiments of the same and the invention therefore is not to be restricted to the precise details of the structure shown and described.

Referring to the drawings, 13 indicates the main frame of a machine of the type shown in the patent above referred to, and reference is made to said patent for a full disclosure of that machine and its mode of operation. For present purposes it is sufficient to say that it is provided with a guideway 14 through which a stream of closed packages is pushed by the action of the package closing device.

Associated with the machine frame 13 is a bed 15 partly supported by the frame 13 and partly by a leg frame 16. Mounted in a suitable bearing in the frame 13 is a shaft 17, this shaft being one of the main shafts of the

machine shown in the patent referred to. The shaft 17 carries a gear 18 which meshes with and drives a gear 19 fast on a shaft 20, the latter being journaled in bearings 21, 22, the bearing 21 being formed in a bracket 23 secured to the frame 13 and bed 15, and the bearing 22 being carried by the leg frame 16 before referred to. The shaft 20 carries a bevel gear 24 which meshes with and drives a bevel gear 25 fast on a vertical shaft 26 mounted in bearings 27 and 28 formed in the bracket 23 before referred to. At its upper end the shaft 26 carries a cam disk 29. Tracking in a suitable groove cut in the under face of the cam disk 29 is a bowl 30 carried by a cam lever 31, this cam lever being fast to a vertical shaft 32 mounted in a long bearing 33 formed in the bracket 23 before referred to. One arm of the cam lever 31 is pivoted to a long link 34, the purpose of which will be hereinafter described. The upper end of the shaft 32 carries and operates a long arm 35 pivoted to a link 36, the purpose of which will be hereinafter described. The cam disk 29 carries a bowl 37 and a segmental lock plate 38, the former during the rotation of the cam disk being adapted to engage radial slots 39 formed on the under side of a turret 40 mounted on a post 41 journaled in a bearing 42 cast on the bed 15 before referred to; and the latter being adapted for engagement at the proper time with segmental locking recesses 43 in the periphery of the turret. It will be readily recognized that the mechanism just described is a well known Geneva movement for producing intermittent rotation of the turret 40 by continuous rotation of the cam disk 29.

The purpose of the turret 40 is to advance cigarette packages from receiving position to opening position, thence to inspection position, and finally to reclosing and ejecting position.

Means are provided for delivering closed packages to the turret, this means consisting of the guideway 14 before referred to, supplemented by a curved guide rail 44 eccentric with the periphery of the turret. By an inspection of Fig. 1, it will be readily understood that the closed packages coming from the packaging machine proper are successively pushed out to the position shown by the leading package in that figure. As the turret rotates from the position shown in that figure, the leading package is swept sidewise out of alinement with the oncoming stream and comes into engagement with the curved guide rail 44 and is thereby pushed farther on to the turret.

To retain each package in proper position in the turret, the latter is provided with a series of package pocket devices 45 radially arranged and open at both ends. Each pocket device is provided with means for holding the package against displacement while the latter is being opened. One side of each package pocket device has an opening 46 and in this opening is mounted a holding plate 47, said plate being pivoted at 48 to a cam lever 49 fulcrumed at 50 to said device and carrying at its free end a bowl 51 which at the proper time engages and is operated by an adjustable cam plate 52 screwed to the bed 15 adjacent the guideway 14. The cam lever 49 is provided with a stop screw 53 and with a stud 54 to which one end of a spring 55 is secured, the other end of said spring being secured to a stud 56 screwed into said device. The stop screw 53 and the spring 55 control the position of the cam lever 49 and therefore of the holding plate 47 during the rotation of the turret, excepting at the position where the package pocket device receives a package and at this point they are controlled by the cam plate 52. In Fig. 3, the holding plate 47 is shown in retracted position within the opening 46 so that a closed package may be pushed into the package pocket device without difficulty. In Figs. 5 and 6, the holding plate is shown in engagement with the shell of a closed package. After a package has been pushed into one of the package pockets, the turret is given a rotating movement, and during the first part of this movement the cam bowl 51 rolls off of the cam plate 52, permitting the holding plate 47 to come into engagement with the slide of the package in the pocket. As the movement of the turret continues, the package comes into contact with the curved guide rail 44 which pushes it farther into the pocket overcoming the friction of the plate 47. By this means the successive packages are all forced to the same relative position on the turret during the first intermittent movement of the same, and there held against displacement.

When the turret comes to rest at the end of its first intermittent movement, it is in position to be opened for inspection, and means operative at this position are provided for this purpose. This means includes a slideway 57 mounted upon the bed 15 before referred to and registering with one of the package pockets of the turret. Arranged to reciprocate in this slideway is a ram 58 having an operating head 59, the area of the latter being somewhat smaller than that of the end of the package in the pocket so that it will contact with the cigarette slide and push it partly out from within the clamped shell without disturbing the latter. The reciprocating movement of the ram is produced at the proper time by the cam disk 29 operating through the link 34 before referred to. To effect this movement, the free end of the link 34 is pivoted to a T-headed arm 60 fulcrumed at 61 to the bed 15 and also pivoted at 62 to one end of an adjustable link 63, the other end of this link being

pivoted by means of a stud 64 to the ram 58. It will be understood that the groove of the cam disk is of the proper contour to produce a package opening movement of the ram 58 and its immediate return to normal position each time that the turret comes to rest.

After the package has been opened, as shown in Figs. 1 and 10, the turret is given further intermittent movements which successively brings an open package to the inspection positions lying at the right of the opening position, as indicated in Fig. 1. Here the operator of the machine may readily see whether or not the foil is damaged and feel the package to determine whether the full number or a lesser number of cigarettes is inclosed. If a defective package is found it is manually pushed out of its pocket in either of the two inspection positions, and discarded.

From the second inspection position another movement of the turret brings a package into position for reclosure and ejection from the turret. As the package moves from the second inspection position to reclosing position, its open end comes into the range of action of a stationary folder 65 screwed to a bar 66, this bar being supported by a bracket 67 rising from the bed 15 before referred to. This movement turns the flap of the slide to upright position, as shown in Figs. 2 and 7. When a package has reached the reclosing position it has passed beyond the range of action of the folder 65 but in passing beyond the range of this folder it comes within the range of action of a folding plate 68, this plate being mounted on a head 69 formed on a lever 70 fulcrumed at 71 to a substantially rectangular frame 72. The free end of the lever 70 carries a bowl 73 tracking on the under side of the bar 66 before referred to which is cut away for a portion of its length; or in other words, from 74 to 75, to permit the lever 70 to rock on its fulcrum 71 and thereby tilt the folding plate 68 slightly downward upon the package. The bowl 73 is held in contact with the surface of the bar 66 by means of a spring 76 connecting a stud 77 projecting from the lever 70 and a stud 78 secured in a sleeve 79 arranged to reciprocate on a bar 80 clamped in a long bearing 81 formed on the upper end of the bracket 67 before referred to. The sleeve 79 is provided with a depending lug 82 to which is pivoted the link 36 before referred to, this link being operated by the cam disk 29 and arm 35 at the same time that the opening device is operated. The frame 72 is fast on a shaft 83 which carries an upwardly extending arm 84 located between two lugs 85 formed on the side of the sleeve 79 and held in adjusted position between said lugs by means of a pair of screws 86.

In Fig. 7, the mechanism just described is shown in the position it occupies when a package is brought by the rotation of the turret into position to be reclosed. In Figs. 8 and 9, the parts are shown in the position they occupy when the reclosing and ejecting device has begun its movement and has progressed far enough to fold the upstanding flap of the slide down upon the package ready for insertion within the slide. It will be readily understood that further movement of the reclosing and ejecting device will push the slide into the shell and then pick up the shell and push the whole reclosed package on out of the package pocket.

As the reclosed package is ejected from the turret, it is pushed on to a stacking wheel 87 of well known construction. This stacking wheel is mounted on one end of a shaft 88 journaled in a bracket 89 attached to the side of the bed 15 before referred to. The opposite end of the shaft 88 carries a bevel gear 90 which is driven by a bevel pinion 91 fast on a shaft 92 journaled in a boss of the bracket 89 and carrying at its other end a sprocket 93. Over this sprocket and driving the same runs a chain 94 driven by a sprocket 95 fast on the shaft 20 before referred to. The stacking device operates to stack the reclosed packages in a chute formed in the bracket 89 in a well known manner and as clearly shown in Fig. 2.

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

What is claimed is:

1. In a cigarette packaging machine, the combination with means for supporting a package, of means engaging and opening said package for inspection in said supporting means.

2. In a cigarette packaging machine, the combination with means for supporting a package, of means engaging and opening said package for inspection in said supporting means, and means for holding said package against displacement during the opening operation.

3. In a cigarette packaging machine, the combination with means for supporting a package, of means for delivering a closed package to said supporting means, and means engaging and opening said package for inspection in said supporting means.

4. In a cigarette packaging machine, the combination with means for supporting a package, of means engaging and opening said package for inspection in said supporting means, and means for intermittently moving said supporting means to advance said package.

5. In a cigarette packaging machine, the combination with means for supporting a package, of means engaging and opening

said package for inspection in said supporting means, and means for reclosing and for ejecting the inspected package from said supporting means.

6. In a cigarette packaging machine, the combination with means for supporting packages, of means engaging and opening said packages for inspection in said supporting means, means for reclosing and for ejecting the inspected packages from said supporting means, and means for stacking the reclosed packages.

7. In a cigarette packaging machine, the combination with means for supporting a package, of means for delivering a closed package to said supporting means, means engaging and opening said package for inspection in said supporting means, and means for holding said package against displacement during the opening operation.

8. In a cigarette packaging machine, the combination with means for supporting a package, of means for delivering a closed package to said supporting means, means engaging and opening said package for inspection in said supporting means, means for holding said package against displacement during the opening operation, and means for intermittently moving said supporting means to advance said package.

9. In a cigarette packaging machine, the combination with means for supporting a package, of means for delivering a closed package to said supporting means, means engaging and opening said package for inspection in said supporting means, means for holding said package against displacement during the opening operation, means for intermittently moving said supporting means to advance said package, and means for reclosing and for ejecting the inspected package from said supporting means.

10. In a cigarette packaging machine, the combination with means for supporting packages, of means for delivering closed packages to said supporting means, means engaging and opening said packages for inspection in said supporting means, means for holding said packages against displacement during the opening operation, means for intermittently moving said supporting means to advance said packages, means for reclosing and for ejecting the inspected packages from said supporting means, and means for stacking the reclosed packages.

11. In a cigarette packaging machine, the combination with an intermittently rotating turret provided with a series of package pockets, of means successively engaging and opening for inspection packages supported and advanced in said pockets.

12. In a cigarette packaging machine, the combination with an intermittently rotating turret provided with a series of package pockets, of a cam actuated device successively engaging and opening for inspection packages supported and advanced in said pockets.

13. In a cigarette packaging machine, the combination with an intermittently rotating turret provided with a series of package pockets, of means successively engaging and opening for inspection packages supported and advanced in said pockets, and a series of spring actuated and cam controlled devices carried by said turret and holding packages against displacement during the opening operation.

14. In a cigarette packaging machine, the combination with an intermittently rotating turret provided with a series of package pockets, of a guideway successively delivering closed packages to said pockets, and means successively engaging and opening for inspection packages supported and advanced in said pockets.

15. In a cigarette packaging machine, the combination with an intermittently rotating turret provided with a series of package pockets, of means successively engaging and opening for inspection packages supported and advanced in said pockets, and a cam actuated reclosing and ejecting device successively engaging the inspected packages.

16. In a cigarette packaging machine, the combination with an intermittently rotating turret provided with a series of package pockets, of a cam actuated device successively engaging and opening for inspection packages supported and advanced in said pockets, and a series of spring actuated and cam controlled devices carried by said turret and holding packages against displacement during the opening operation.

17. In a cigarette packaging machine, the combination with an intermittently rotating turret provided with a series of package pockets, of a cam actuated device successively engaging and opening for inspection packages supported and advanced in said pockets, a series of spring actuated and cam controlled devices carried by said turret and holding packages against displacement during the opening operation, and a cam actuated reclosing and ejecting device successively engaging the inspected packages.

18. In a cigarette packaging machine, the combination with an intermittently rotating turret provided with a series of package pockets, of a cam actuated device successively engaging and opening for inspection packages supported and advanced in said pockets, a series of spring actuated and cam controlled devices carried by said turret and holding packages against displacement during the opening operation, a cam actuated reclosing and ejecting device successively engaging the inspected packages, and a continuously operative stacking device receiving the packages from said reclosing device.

19. In a cigarette packaging machine, the combination with an intermittently rotating turret provided with a series of package pockets of a guideway successively delivering closed packages to said pockets, a cam actuated device successively engaging and opening for inspection packages supported and advanced in said pockets, a series of spring actuated and cam controlled devices carried by said turret and holding packages against displacement during the opening operation, a cam actuated reclosing and ejecting device successively engaging the inspected packages, and a continuously operative stacking device receiving the packages from said reclosing device.

20. In a cigarette packaging machine, the combination with an intermittently rotating turret provided with a series of package pockets, of a slideway adjacent said turret and successively in register with said pockets, and a package opening device working in said slideway.

21. In a cigarette packaging machine, the combination with an intermittently rotating turret provided with a series of package pockets, of a support successively overlying said pockets, and a package reclosing and ejecting device working on said support.

22. In a cigarette packaging machine, the combination with an intermittently rotating turret provided with a series of package pockets each having an opening in one of its sides, of a corresponding series of package clamping devices working in said openings, a slideway adjacent said turret and successively in register with said pockets, and a package opening device working in said slideway.

23. In a cigarette packaging machine, the combination with an intermittently rotating turret provided with a series of package pockets each having an opening in one of its sides, of a corresponding series of package clamping devices working in said openings, a slideway adjacent said turret and successively in register with said pockets, a package opening device working in said slideway, a support successively overlying said pockets, and a package reclosing and ejecting device working on said support.

In testimony whereof, I have signed my name to this specification.

ELBERON D. SMITH.