

March 10, 1936.

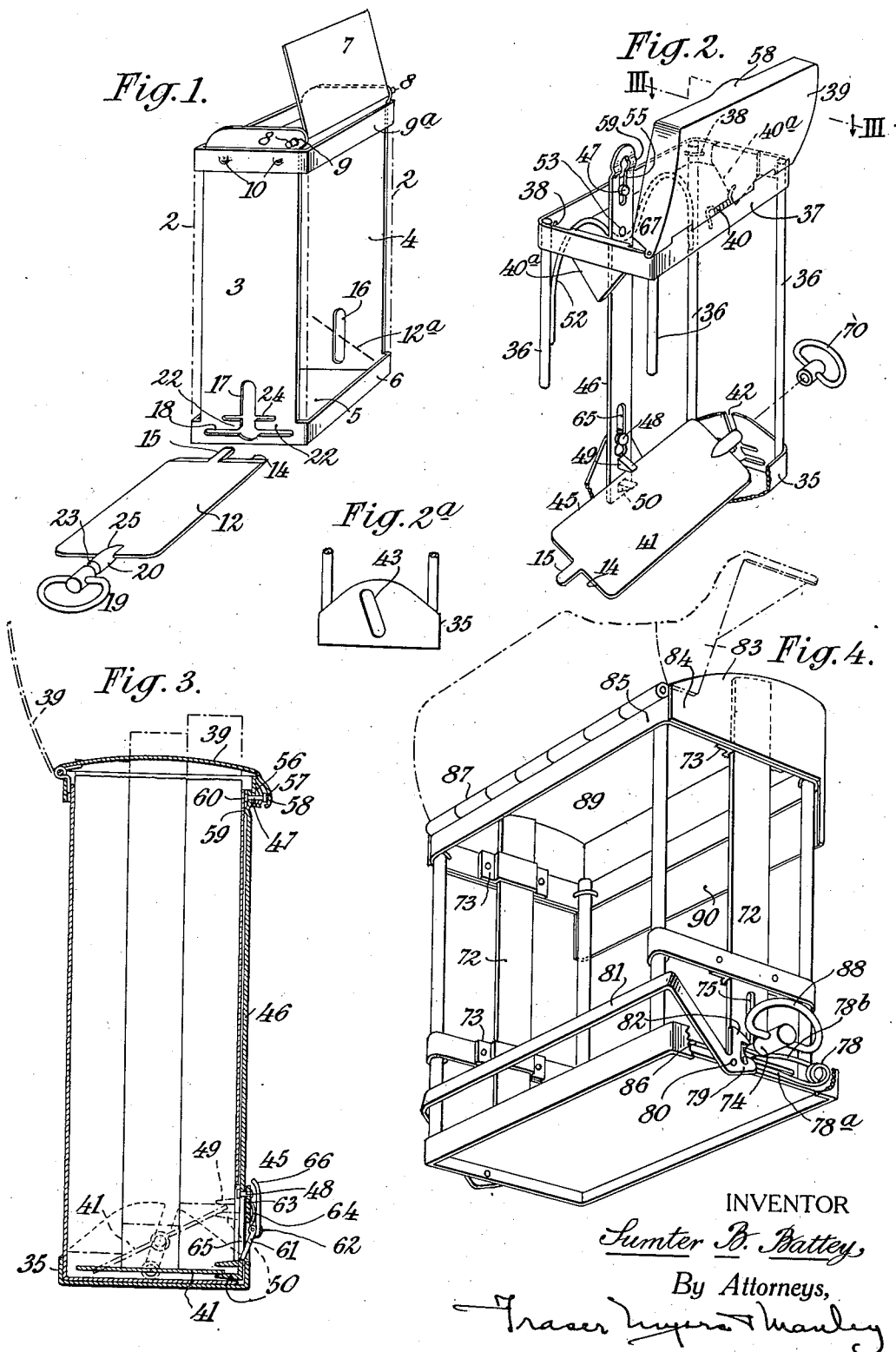
S. B. BATTEY

2,033,174

EJECTOR MECHANISM

Filed June 16, 1930

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

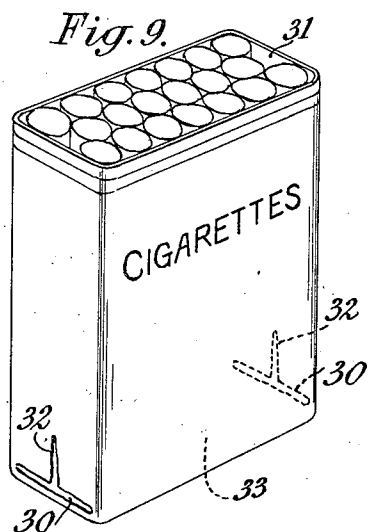
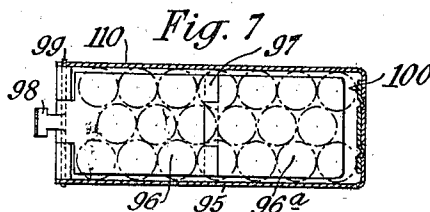
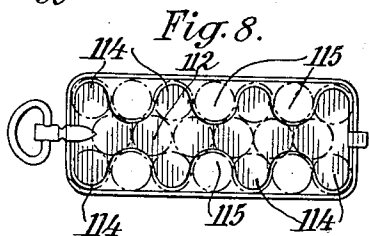
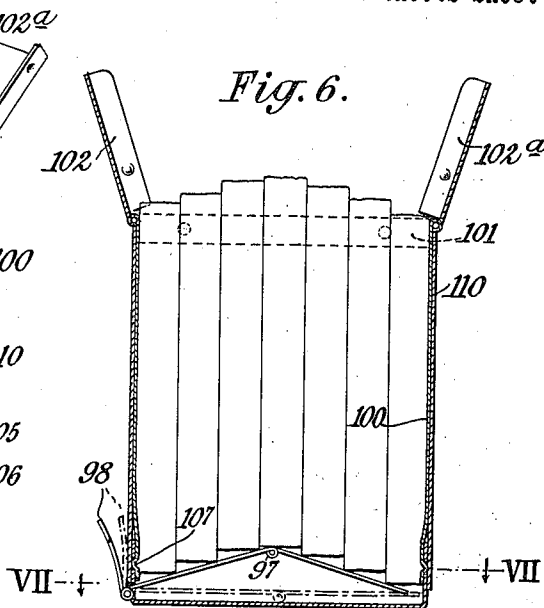
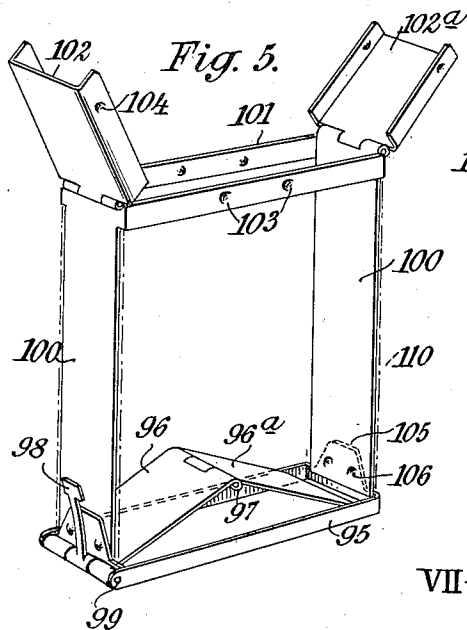


Fig. 10.

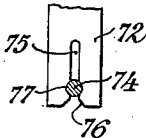


Fig. 11.

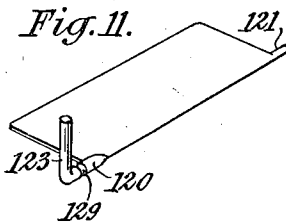
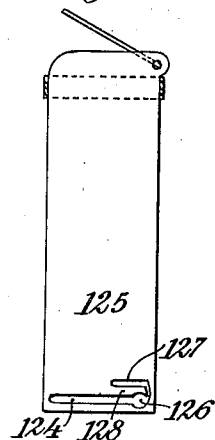


Fig. 12.



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EJECTOR MECHANISM

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Application June 16, 1930, Serial No. 461,311

16 Claims. (Cl. 206—41)

This invention relates to improvements in ejector devices particularly adapted to facilitate the removal of cigarettes from a pack, although the invention is applicable generally to the ejection of articles from containers of various types.

One object of the invention is to provide ejector means which can be applied to a fully-packed container without materially disturbing the original arrangement of its contents. To this end there is provided an ejector element which is adapted to be inserted through a wall of the original container so as to occupy a position beneath a part or all of the articles therein and which is operative to eject, stagger, or differentially elevate said articles to a position where they are more accessible than in their normal arrangement within the container.

A further object of the invention is to provide a frame adapted to receive a container, such as the usual paper or foil cigarette package, and to lend support thereto whereby to permit the operation of the aforesaid ejector element therewith without subjecting the container to disruptive stresses, the said frame also carrying a top and having certain other novel features which particularly adapt it for protecting the contents of a cigarette pack and holding such pack in shape.

Another object is to provide a restraining element which co-operates with the ejector to effect a prescribed stagger arrangement of the articles by resisting such accidental movement of the articles as might otherwise result from their adhesion one with another during ejection. This element may constitute a hinged closure or top for the container or it may be an independent member specially provided for the purpose. This element may also serve to restore articles to their normal position within the container after the operation of the ejector. The invention further provides an operative connection between the ejector element and the aforesaid restraining element or movable top whereby to insure their concurrent operation, the said top being preferably automatically opened by the operation of the ejector.

The top or closure herein provided may be so formed as to prevent the accidental displacement of articles from the container even when the top is in the open position. Furthermore, when closed, the top may provide additional space above the normal height of the original container wherein the cigarettes or other articles may project somewhat above the position

in which they were originally packed and within such space the articles may be displaced vertically or staggered relatively to one another in such manner as to render certain of them more accessible upon the opening of the top without further manipulation.

Other features of novelty reside in the ejector itself which is especially adapted to be inserted through a small aperture in the wall of a paper, foil, or other frail container. The said ejector may simply be forced through the light material of the container wall or a slit may first be cut through such wall with a sharp instrument.

The disposition of the ejector element within the original container in such manner as to react against the bottom thereof during ejection of the articles whereby to insure relative movement between said articles and the container, is another feature of the invention. The method and means herein disclosed for operating the ejector, either manually or by energy stored in a spring, constitute further features of novelty. Further objects of the invention will be apparent from the following more detailed description, in which reference is had to the accompanying drawings, wherein—

Figure 1 is a perspective view of a simple embodiment of the invention applicable to the usual paper or foil cigarette package, the ejector element being shown displaced from its normal position within the container.

Fig. 2 is a perspective view of a modification containing certain features which are not present in Fig. 1.

Fig. 2a is a fragmentary side elevation of the end guide for the ejector element which guide has been broken away in Fig. 2.

Fig. 3 is a central vertical cross-section taken along the line III—III of Fig. 2.

Fig. 4 is a perspective view of a further embodiment of the invention.

Fig. 5 is a perspective view of still another embodiment, the frame and ejector mechanism being shown as it appears prior to the insertion of the cigarette package.

Fig. 6 is a vertical section of the device shown in Fig. 5 and shows the cigarette package in place.

Fig. 7 is a horizontal cross-section taken along the line VII—VII of Fig. 6.

Fig. 8 is a plan view of a modified form of ejector blade which may be employed in any of the devices illustrated in Figs. 1 to 4 inclusive.

Fig. 9 is a perspective view of the usual commercial cigarette package and shows the pre-

aration of such package to receive the ejector device.

Fig. 10 is a fragmentary side elevation showing a detail of construction of the embodiment illustrated in Fig. 4.

Fig. 11 is a perspective view of a modified form of ejector blade.

Fig. 12 is a side elevation of a frame adapted to receive the modified blade shown in Fig. 11.

A simple form of the invention is shown in Fig. 1, the device there shown being particularly adapted for use in connection with the standard cigarette package containing twenty cigarettes packed in vertical position. The position which such package or container would occupy is indicated by dotted lines 2, the package being omitted from the figure to avoid obstructing certain details of the construction. The frame of the device comprises two parallel upright frame members, 3, 4, which at their lower ends are secured to a bottom member or tray 5. In order to retain the cigarette package securely in position relative to the frame, the tray is preferably provided with flanges 6 along its open sides. It will be apparent that the uprights 3, 4, and tray 5, may be formed integrally by suitable stamping and bending operations upon a sheet of metal. It is desirable that the parts be made of comparatively thin metal for the purpose of lightness and also because it is desirable with certain types of cigarette packages having outer and inner wrappings, to insert the side members 3, 4 of the frame between such wrappings.

At the upper end of the frame a hinged cover or top is provided, this top in the simple form illustrated, consisting of a flat metal plate 7 having formed at its ends and close to one edge the lugs 8 which are received in small holes 9 which are formed in the upper ends of the side members 3, 4 of the frame. This affords a simple method of hinging the cover to the frame and permits of the ready removal of the cover when it is desired to slip the frame members 3, 4 up between the inner and outer wrappings of a cigarette package. This obviously could not be done with the top in place. The side members are preferably so formed that they tend normally to spring inwardly in such manner as to insure the retention of the cover 7 when the latter is inserted there-between and also to maintain frictional engagement, with the cover to retain it in a desired position. This frictional engagement of the cover or top also affords a further important advantage in connection with the operation of the ejector device as will hereinafter more fully appear. To insure the retention of the cover between the side members of the frame, a light metal band 9^a may be provided, this band being sufficiently large to slide freely over the cigarette package and to be slipped up along the frame members to the point indicated, where it snaps into position, there being provided slightly recessed points 10 on the inner surface of the band which are engaged by correspondingly raised portions on the outer faces of frame members 3 and 4. The aforesaid band 9^a also affords desirable protection and reinforcement for the upper and open end of the cigarette package, although it is not essential to the operativeness of the device, the frame and top as above described having been successfully employed without such band. In this connection, it may be observed that when the frame members 3, 4 are slipped

age, they not only protect the sides of the package but also serve to tension the outer wrapping so that the unsupported front and rear faces thereof are held taut and thus resist any normal force that might tend to compress the faces of the package.

The ejector element in its simplest form may consist of a thin rectangular metal plate, 12, which is adapted to be inserted through the end wall of the cigarette package at a point beneath the cigarettes. This plate is sufficiently thin to permit its being forced through the paper wall of the package without unduly deforming the latter and may then be slipped under the cigarettes without materially disturbing their normal arrangement in the package. If desired, the end of the ejector plate, 12, may be sharpened to provide a knife-like edge, 14, to facilitate penetration of the paper wrapping. On the other hand, if the wrapping should be unusually heavy or tough, it is a simple matter to make a slit at the proper place with the end of a pointed knife, it being then possible to slip the ejector plate, 12, into position beneath the cigarettes without any effort. The entering end of the ejector plate is provided with a central projecting lug, 15, which when the plate is fully inserted within the package, extends through the further side thereof and enters a guide slot, 16, formed in the vertical frame member 4. The vertical frame member 3 is similarly slotted at 17, and is also provided with a horizontal slot 18 through which the ejector plate 12 is slipped when the latter is being moved into position within the package. A key or finger-grip 19 is provided for operating the ejector. This key being preferably swivelled on a short shaft, 20, projecting from the central axis of the ejector plate. It will be understood that the key, 19, swivels about an axis at right angles to shaft 20 so that it permits of the application of torque to such shaft and the plate 12 to which the shaft is rigidly attached. The object of the swivel connection is simply to permit the key to drop down parallel to the end of the frame, 3, when not in use. When the ejector plate is slipped into operative position within the cigarette package, it is frictionally retained against longitudinal displacement by the engagement of resilient tongues, 22, with an annular "V" groove, 23, formed on shaft 20. The resilient tongues 22, are conveniently provided by horizontally slitting metal frame member 3 along a line, 24, as shown. This provides the marginally unsupported projections, 22, which will have sufficient resiliency to afford the desired yielding effect to permit the tapered advancing end, 25, of shaft, 20, to spring the projections upwardly when the ejector is inserted, the said projections then springing downwardly into annular groove, 23, when the ejector is in its normal position within the container. When it is desired to remove the ejector plate, the camming action of the V groove, 23, when a slight axial force is exerted upon the ejector, will lift the tongues, 22, out of the groove and permit the free removal of the ejector.

The operation of the above-described embodiment of my invention is as follows:—The ejector plate or blade 12 is removed from the frame. If the device is to be applied to the usual commercial form of paper or foil cigarette package sold by the leading makers of cigarettes in this country, it is preferable to insert the thin side members 3, 4 of the frame within the paper-wrapper of the package. This has the particular

advantage of completely exposing all sides of the wrapper to view so that it presents the appearance of the normal package, the frame being almost completely hidden from view. When used in this way, only the bottom member 5 of the frame and the pivoted top 7 are seen, thus avoiding an appearance of bulkiness or weight that inevitably results from enclosing the package in a solid metal frame. It will be understood that because of the yielding nature of the cigarette package and its contents, it is quite possible to slip the package between the upright frame members 3, 4, but as above set forth I prefer to insert such members inside one or more of the wrappings which constitute the container. To accomplish this, the band 9^a is slipped to the bottom of the frame, thus permitting the pivoted cover 7 to be slipped from between the frame members 3, 4. The wrappings of the cigarette package may then be slit open at the two ends and close to the bottom, as indicated at 30 in Fig. 9, which shows a cigarette package prepared to receive my device. The top of the package is torn off or cut away as indicated at 31 to permit the free ejection of the cigarettes. Vertical slits 32 may also be made in the package to permit the free verticle displacement of the members 15, 20, which constitute the pivots of the ejector blade. While the various slitting operations above described can be carried out with greater neatness if done with a sharpened instrument like a knife, it will be understood that the use of such instrument is not necessary inasmuch as the material constituting the side members 3, 4 of the frame and also the material of the ejector blade 12 is sufficiently thin to serve as an effective cutting instrument. Furthermore, as hereinbefore set forth, the end of the ejector blade may be sharpened as shown at 14 to provide a knife edge for this purpose, or a small, pointed, double-edged paper knife may be supplied with the device and conveniently carried in the frame or slipped within the wrappings of the pack.

With the package prepared as shown in Fig. 9, the frame members 3, 4, are inserted in slits 30, and slipped upwardly within the wrappings until they project slightly above the top of the package, the package at such time seating securely against the bottom, 5, of the frame. The hinged top, 7, is then sprung into position between the said side members, and the band, 9^a, is slipped up to the top of the package to secure the frame members against springing apart. The ejector blade, 12, is then passed through slot 18 in the frame and through the slit 30 at the bottom of the cigarette package, the blade passing beneath the cigarettes and lying snugly against the bottom of the package. When the blade is in proper position within the package, pivot 15 projects into the vertical guide slot 16, in the frame member 4 and the V groove in pivot 29 is engaged by resilient tongues 22 so as to retain the ejector against axial displacement while permitting its free rotation and elevation within vertical guide slots 16, 17.

The ejection of the cigarettes results from motion imparted to ejector blade 12 by a slight rotation or twisting of its key or finger grip, 19. Turning this key clockwise results in an inclination of the ejector blade as indicated by the dotted line 12^a in Fig. 1. Since the right-hand edge of the blade engages the bottom of the package, the only possible movement resulting from the application of a twisting force or torque to the key 19 is an elevation of the left-hand edge of the

blade. This canting of the blade results in elevating the cigarettes lying above it, but the elevation of the cigarettes in the different rows will obviously be of different degree, the row toward the high side of the blade being furthest ejected, the middle row to a lesser degree and the row lying above the low side of the blade remaining almost in its normal position within the package. This staggering or differential elevation of the rows or tiers of the cigarettes within the package is clearly seen in Fig. 3. Although this figure shows a somewhat modified construction, the rocking or canting of the ejector blade is the same and produces the same differential elevation of the cigarettes. The cigarettes in this figure are shown in dotted lines, their indicated position resulting from the inclination of the ejector blade 41 as shown in dotted lines.

Returning to the construction shown in Fig. 1, it will be observed that the elevation or ejection of the cigarettes due to the canting of the ejector blade is somewhat resisted by the top 7, which, as hereinbefore described, is frictionally held between the side frame members 3, 4. This feature is important when the device is operated on a full package of cigarettes because the latter are usually packed tightly in the original container, and for this reason have a tendency to adhere one to another. Were it not for the resistance offered by the said top, 7, the tendency would be for all the cigarettes to move together so that there would be no staggering effect. The cigarettes, although elevated from their normal position within the container, would be hard to remove one at a time. The differential elevation or staggering of the cigarettes results in rendering certain of them readily accessible so that they may be freely picked from the package without damage to the remainder. Since during the first part of its upward swing, the frictionally-held top, 7, moves through substantially the same angle as the ejector blade, it will be clear that the cigarettes in the tier nearest to the pivots, 8, of said top will be prevented from rising to the same elevation as the succeeding tiers. After the required number of cigarettes have been removed from the package, those remaining are returned to their original position by simply closing the top, 7.

While with a full package of cigarettes it is desirable to operate the ejector blade, 12, in the manner above described, it may be conveniently operated in a somewhat different manner when there are but a few cigarettes remaining in the package. It will be clear that since the two ends of the blade are freely guided in vertical slots 16, 17, if a downward pressure is exerted upon the key, 19, the blade will fulcrum at the bottom of slot 17 and the far end of the blade will be elevated. If the package be slightly inclined, the loose cigarettes will slide to the side 4, whereupon an inclination of the ejector blade as last described will result in ejecting all of the loose cigarettes to a somewhat greater height than if the blade were rocked about its longitudinal axis as described in the first instance. Such rocking about its longitudinal axis has the advantage of permitting the exercise of considerably greater force in the ejection operation, which force is necessary where the cigarettes are tightly packed. It will be apparent that the aforesaid construction permits of the ejector blade 12 being simultaneously rocked about its longitudinal axis and tilted about an imaginary horizontal transverse axis, that is to say, the two movements

above described may be executed simultaneously. This results from the fact that the blade 12 is so mounted that it may freely rock about an axis passing through the pivots 15, 20, and also tilt so that one end of the blade is higher than the other, the latter motion being permitted by the free sliding of the said pivots in either of the vertical slots 16, 17. The said oblique or compound motion of rocking and tilting the blade permits of obtaining a more marked and general differentiation in the height to which the cigarettes are elevated upon the operation of the blade than if either the said rocking or tilting movements were used alone. The effect of the oblique motion is to simultaneously differentiate the elevation of each of the cigarettes in each of the three parallel rows, and also to differentially elevate the three rows. The latter differentiation is that indicated by the dot and dash lines at the upper part of Fig. 3, while the first mentioned differentiation is similar to that indicated in Fig. 6, except that the elevation of successive cigarettes is continuous from one edge of the pack to the other, this difference resulting from the fact that in the Fig. 1 construction the ejector blade is continuous from one end to the other, whereas in the Fig. 6 construction the blade is articulated at the center.

It will be noted that while there is no necessity for tearing away the bottom 33 of the original cigarette container (Fig. 9) in order to obtain the intended operation of the ejector blade, this can be done if desired, and it is to be understood that such container with the bottom removed is still considered to be an "original container" within the meaning of the term as used herein and in the appended claims. The term "original container" as used herein is intended to define any form of enclosure, whether it be of paper, foil, card-board or other material, in which the articles such as cigarettes in the present example, are packed for commercial purposes and which serves to retain the said articles in substantially the position in which they were originally packed and to protect said articles from contamination, until delivered to the consumer. It will be clear that the subsequent removal of the top or bottom, or indeed, portions of the sides of a cigarette package in preparing it for use with the present ejector mechanism, would not, within the meaning of the term as used herein and in the appended claims, alter its nature from that of an "original container". One of the important advantages of the device according to the present invention which distinguishes it from devices hitherto known resides in the fact that means are provided for the ejection of cigarettes from an "original container", thereby eliminating the heretofore troublesome necessity of removing articles such as cigarettes from their original container and placing them in some other container specially provided with ejection mechanism.

In Figs. 2, 2a and 3 there is shown a somewhat modified form of my invention, although in this the features hereinbefore described are incorporated in substantially the same manner. The base of the frame comprises a flanged tray 35, at the four corners of which are secured upright rods 36, to the upper ends of which is frictionally attached an upper frame member or band 37. Such frictional attachment may be conveniently effected by providing resilient straps 38 across the corners of the said frame member, said straps being sufficiently close to the corners to insure the upright rods 36 being frictionally held when

inserted between the straps and the corners of the frame. If desired, rods 36 may be slightly notched at the point where the straps 38 normally engage them, in order to insure against accidental displacement from the frame member 37. The cover or top 39 may be permanently hinged to the frame member 37, and is preferably provided with a hinge spring 40 tending normally to throw the cover to the open position.

The above described arrangement has the same advantages as the removable top 7 in the Fig. 1 construction, inasmuch as it permits of the ready removal of the top 39 (and its supporting frame member 37) should it be desired to slip the upright frame members 36 upwardly through the wrappings of a cigarette package. On the other hand, the space between said upright members is sufficient to permit the package to be slipped between them without causing the uprights to enter within the wrappings should it be desired to employ the device in such manner. If the rods 36 are not slipped within the wrappings of the cigarette package, it is desirable to provide some means for anchoring the wrappings so that the package does not collapse after a number of the cigarettes have been removed. While the frame members afford a degree of protection, nevertheless pressure may be applied to the wrappings between the uprights 36, and this would tend to get the package out of shape. To avoid this, anchorage may be provided for holding the sides of the package in normal position. Such anchorage may conveniently take the form of downturned ears 40a formed integrally with the upper frame member 37. These ears are inserted within the wrapping of the package when the upper frame member is slipped into place on the uprights 36, there being provided sufficient space between the said ears and the ends of the frame to receive the wrapping therebetween. The ears are preferably triangular or pointed, to facilitate their insertion within the wrapping, and are so thin that they do not crowd the cigarettes in any way when the ears are slipped into position within the container or between the outer and inner wrappings thereof.

The ejector blade 41 is identical with that shown at 12 in Fig. 1, and may be operated in like manner. The guide slots 42 and 43 (Fig. 2a) differ from slots 16, 17 in the previously described embodiment only in being inclined slightly to the verticle. This permits of a slightly greater elevation of the front tier of cigarettes, and also causes the elevated edge 45 to travel in a substantially vertical line when the blade is rocked, for a purpose that will hereinafter appear.

At the front of the frame, and centrally thereof, there is provided a vertical slide 46, which is guided by headed pins 47, 48 secured in the upper and lower frame members and lying within vertical guide slots formed in the slide 46. At the lower end of slide 46, inwardly projecting lugs 49, 50 are provided, said lugs being adapted to freely receive ejector blade 41 between them. A spring is provided to urge slide 46 upwardly, such spring conveniently being formed of a piece of spring wire 52 bent as shown in Fig. 2 and secured to the upright frame rods 36. A stud 53 secured to slide 46 engages the spring wire 52 in such manner as to insure the desired action of the spring in elevating the said slide.

The headed pin 47 lying within the guide slot 55 is free to slide axially through the upper

frame member 37 and in addition to affording a guide for the upper end of slide 46, performs the function of a releasable detent for the spring actuated top 39. As seen in Fig. 3, a leaf spring 56, or other resilient means, such as a spring washer, lying under the head 57 of pin 47, tends normally to hold such pin in the position shown where the pin engages a recessed portion 58 of top 39, thus restraining such top from being opened by the action of its spring 40. It will be noted that near the upper end of slot 55 the slide 46 is dented inwardly to provide a cam surface 59 which, upon the upward movement of slide 46 from the position indicated in Fig. 3 will engage the inner head 60 of pin 47, thus withdrawing said pin from engagement with the recess 58 in the cover and permitting such cover to spring open.

A trigger lever 61 pivoted between ears 62 formed in the flange 63 of the bottom frame member or tray is normally urged by a leaf spring 64 into engagement with slide 46 at the bottom of its lower guide slot 65. In this position the trigger prevents the upward movement of said slide 46 that would otherwise be induced by spring 52. The upper arm of trigger lever 61 is preferably formed as a flattened thumb piece 66 which when pressed inwardly, causes the lower arm of the trigger to be withdrawn from slot 65, thereby permitting slide 46 to be moved upwardly by spring 52.

From the foregoing description the operation will be apparent. Upon applying pressure to the thumb piece 66, the slide 46 springs upwardly. During its initial travel the cam 59 on said slide releases detent pin 47, thus permitting the cover to spring open. At the same time the ejector blade 41, being engaged by lug 50 at the bottom end of the slide, is elevated to the position shown in dotted lines in Fig. 3, such elevation naturally occurring largely after the release of the top 39, although a certain clearance is provided between such top and the upper end of the cigarettes when the top is closed to permit of the necessary elevation of the slide 46 and blade 41 to effect the release of the top as above described. In order to insure the desired staggering of the three tiers of cigarettes as indicated in dotted lines in Fig. 3, the initial upward swinging of the top is preferably frictionally resisted, so that, should the cigarettes tend to adhere one to another, such adhesion will not result in the movement of all the cigarettes as a mass. This frictional resistance to the opening of the top may conveniently be obtained by bending the corners 67 of the hinged top inwardly so that they exert a slight frictional gripping effect against the side surfaces of the top frame member 37. This friction is, however, insufficient to prevent spring 52 from elevating slide 46, with the resulting upward movement of the cover 39 which normally lies above said slide. The action of the slide in this respect has the advantage of relieving the cigarettes from any compressional strain during the upward swinging of the ejector blade, the ejector blade and the top 39 being operatively connected by the slide. Similarly, after the ejection operation, when it is desired to return the cigarettes to their normal position within the container, the closing of the top results in the downward movement of slide 46, the lug 49 thereof lowering the ejector blade to its normal position.

With a full package of cigarettes, considerable force is sometimes required to eject the cigarettes,

because of their being packed tightly within the container. At such times the ejector blade is preferably manually operated by the rotation of the key 79, instead of relying upon the effect of spring 52. In Fig. 2 the key, which is rigidly connected to the ejector blade, is shown slightly separated therefrom, in order to avoid confusing the drawing.

A further embodiment of my invention is illustrated in Fig. 4. The operating features of this device are generally similar to those above described. Instead of providing only a single vertical slide such as 46 in Fig. 2, two slides 72 are provided in the present instance. These slides are guided in suitable brackets 73 secured to the frame and are operatively connected at their lower ends to the end pivots or shafts 74 of the ejector blade. The details of such connection are best seen in Fig. 10. It will be noted that the lower end of each slide 72 is slit at 75, the entrance 76 to said slit being in the form of a V. Just above the entrance, and forming a continuation thereof, is a circular aperture 77 which receives and serves to retain the pivot 74 of the ejector blade. The slit 75 is sufficiently long to give the necessary resiliency to the forked end of the slide to permit the pivot 74 to be readily snapped into position. It will be apparent that the blade would be first inserted in the bottom of the cigarette package as hereinbefore described, the slides 72 then being snapped over the pivots.

Lying beneath the pivots at the two ends of the ejector blade, are U-shaped springs 78, the lower arms 78^a of which are secured to the horizontal arms 79 of a trip lever pivoted at 80, said lever being in the form of a bail 81 which extends around the outside of the frame as shown in Fig. 4. The upper arms 78^b of springs 78 directly engage the pivot 74 of the ejector blade, and tend to move the latter upwardly. Such upward movement is normally restrained by the engagement of detents 82 with the spring arms 78^b. The said detents are formed integrally with the bail or trip lever 81, and when such bail is swung downwardly the detents are withdrawn, thus permitting the springs to raise the ejector blade and slides 72, the upper ends of which engage the hinged top 83 and thus swing the top open upon the operation of the ejector. The top is preferably frictionally held, as in the embodiments previously described, the side members thereof being sprung inwardly to provide a slight frictional engagement between the corners 84 and the sides of the upper frame member 85 on which the top is hinged. This frictional restraint of the movement of the top insures the desired staggering of the cigarettes as they are ejected in the manner hereinbefore fully set forth, and also insures the canting or tilting of the ejector blade 86, since such restraining action of the top prevents the cigarettes lying nearest the hinge 87 from moving upwardly as far as the cigarettes which are further removed from said hinge. As in the previously described embodiment, the ejector blade can be manually operated by direct manipulation of the key 88, should the contents of the container be so tightly packed as to prevent the proper functioning of spring 78. This condition would not obtain after a few of the cigarettes had been removed from the container.

A further feature of the top as shown in Fig. 4 resides in the provision of space above the position normally occupied by the cigarettes. It will be noted that the arched upper surface 89 of the top is set at an oblique angle to the upper end

of the frame, there being thus provided a clearance of approximately half an inch above the cigarettes in the tier furthest removed from the hinge 87, while there is only a slight clearance for the cigarettes in the tier adjacent thereto. This permits of a very simple method of staggering the cigarettes, particularly when a sufficient number have been withdrawn from the pack to permit of their free movement therein. Under such conditions, and even when the cigarettes are tightly packed, they can be shifted into staggered relationship by simply inverting the back, or, if necessary, giving it a sudden shake while in the inverted, or at least a downwardly inclined position, so as to bring the cigarettes into the space within the cover, either by the force of gravity or by the momentum imparted by the sudden movement of the container. The top 83 may then be manually raised (it being held in the close position solely by friction) and the cigarettes will then be found to occupy staggered relationship, because of the different degrees of movement permitted within the space provided by the specially shaped top. A further advantage of the top as shown in Fig. 4 resides in the provision of what may be described as a safety apron 90 which, when the top is closed, lies snugly against the side of the container but which, when the top is open, extends over the open end of the container sufficiently to prevent the accidental displacement of the cigarettes should the container be inverted or inclined downwardly toward its open end. The top and safety apron in the open position are indicated in dotted lines. It will be understood that when the top is thus opened free access may be had to the cigarettes and they may be withdrawn by slightly inclining them to escape the apron, or, with a full pack, the top may be opened somewhat further so as to permit the removal of a cigarette without any inclination thereof.

A further embodiment of the invention is illustrated in Figs. 5, 6 and 7, there being provided in this instance a frame having a bottom member or tray 95, which carries a two-piece ejector blade, the sections 96, 96^a of which are hinged together at 97 to provide what may be termed a toggle blade. The section 96, at its left end, is formed integrally with an actuating lever 98 which, when the toggle blade is lying in its normal flat position in the bottom of the container, rests snugly against the side of the package in the position indicated in dotted lines in Fig. 6. The lever and blade together constitute a bellcrank, which is pivoted to the bottom frame member or tray 95 at 99. It will be seen that the toggle blade 96, 96^a is sufficiently thin to permit of its being readily inserted at the bottom of a cigarette package through a slit in the wall, such as shown at 30 in Fig. 9.

The frame of the device is completed by thin upright side members 100 which are rigidly secured to an upper frame 101, on which the sections 102, 102^a of the top are pivoted as shown. These top sections are frictionally retained in their closed position by slight projections 103 formed on the outer surfaces of frame member 101 and which engage corresponding recesses 104 in the hinged sections of the top. The side members 100 of the frame are preferably removably secured to the bottom member or tray 95 to permit of their being slipped within the wrappings of the cigarette package before the bottom frame member carrying the toggle blade 96, 96^a is secured thereto. To this end, vertical ears 105

are formed at the ends of the tray, said ears having apertures 106, which receive corresponding projections 107 formed at the lower ends of frame members 100. These members are preferably formed of resilient material so as to tend normally to spring outwardly into secure engagement with the ears 105. Obviously, various other methods of attaching the tray 95 to the side members 100 may be employed. The position of the frame members 100 within the cigarette package will be seen in Figs. 6 and 7, wherein the wrapper is shown at 110 (also in dotted lines in Fig. 5).

The operation of the above described embodiment is obvious, and after the top of the cigarette package has been torn away and the toggle ejector inserted within the package with the frame in the position described, the cigarettes are ejected or differentially elevated, as shown in Fig. 6, by the simple swinging of the lever arm 98 from the dotted line to the full line position, this causing the toggle to buckle in the middle. During the initial elevation of the cigarettes their upward movement is resisted by the frictional engagement of the top members 102, 102^a with the frame 101, thus insuring the staggering of the cigarettes and preventing any adhesion between them from causing several to move similarly instead of differentially as required to effect the desired staggering whereby the cigarettes are rendered readily accessible.

In Fig. 8 there is shown a somewhat modified form of ejector blade 112 corresponding to the ejector blades 12, 41 and 86 in the three first described embodiments, and it will be understood that the modified form of blade may be used in conjunction with any of said embodiments. The object of the modified blade is to provide for an additional staggering effect beyond that which would result from the canting or inclination of the blade as hereinbefore described. This additional staggering effect is achieved by cutting away certain portions of the blade so that it will act only on alternate cigarettes in a tier or otherwise act upon certain of the cigarettes and escape certain others, which will thus be permitted to remain in their normal position within the container. To this end, the blade 112 is serrated, the projections or teeth 114 on either side of its longitudinal axis being positioned so as to engage alternate cigarettes in the front and rear tiers. The cigarettes indicated at 115 will lie between such projections and consequently will not be acted upon when the blade is tilted. The result of this will be that the alternate cigarettes in a tier lying above the teeth will be elevated when the blade is rotated or tilted, while the cigarettes lying between the teeth will remain in their normal position within the container. This has the advantage of causing every alternate cigarette to project upwardly from the adjacent cigarettes, thus rendering them somewhat more accessible than if all the cigarettes in a tier were elevated to the same degree.

A further modified form of ejector blade is shown in Fig. 11, this differing from the previously described blades only in that its pivots 120, 121 are formed at the corners of the blade 122 instead of centrally thereof. The key or finger grip may be in the form of a simple arm 123 rigidly secured to the projecting end of pivot 120 and may be normally disposed in a vertical position as shown or at any other desired angle. As in the previously described constructions, the

ejector blade is inserted beneath the cigarettes and it is rocked or canted by manipulation of finger piece or arm 123, which lies outside the container. With this type of ejector blade, it is necessary to use a slightly modified form of frame, as shown in Fig. 12, there being provided a horizontal slot 124 at the lower end of the side member 125 of said frame, and there being provided a somewhat enlarged circular opening 126 at one end of said slot to receive the pivot 120 of the ejector. The side member of the frame may be cut away, as shown at 127, in order to provide a resilient tongue 128, which will snap into a V-groove 129 formed in the pivot 120 when the ejector blade has been inserted within the frame. With the pivotal axis of the blade located at the edge instead of centrally thereof, it is not necessary to provide for any vertical displacement of the pivots 120, 121, these simply rocking about the pivotal axis without any vertical displacement when the ejector blade is inclined.

In the appended claims it will be understood that the expression "original container" is used, as hereinbefore set forth, to signify a form of commercial enclosure or container of paper, foil, cardboard or other material which serves to retain articles, such as cigarettes, in substantially the position in which they were originally packed, and also to enclose and protect said articles from contamination until delivered to the consumer. According to the present invention it is unnecessary to remove the articles from the "original container" and transfer them to another container equipped with the ejecting mechanism. Such re-handling of delicate articles such as cigarettes, is obviously objectionable. Furthermore, the present invention permits the display of the "original container" with its distinctive ornamentation so that one may determine at a glance the brand of the articles which are being dispensed.

While various embodiments and modifications of my invention have been hereinbefore described and illustrated, it will be understood that the invention is not limited thereto but may be otherwise variously modified and embodied without departing from the spirit thereof as set forth in the following claims.

What I claim is:

1. An ejector device adapted for use in displacing articles of merchandise in the original package in which they are put up and sold, after first opening the top of the package, said device comprising a thin blade of the approximate size of the inner bottom wall of the package, so that it may be thrust through the bottom of one of the side walls to a position between the bottom wall and the articles of merchandise to be displaced, a blade manipulator comprising a part of a relatively short extension of the blade adapted to project but a short distance from the outer wall of a package in which the blade has been inserted, and a neck of relatively small cross-sectional area as compared with the width of the blade and size of the manipulator, the said neck comprising the part of the extension which connects the blade with the manipulator, the neck being so disposed as to pass through the wall of a package in which the blade has been inserted and leave the manipulator in a position such that it may serve as a means of tilting the blade after it has been inserted in a package and cause the articles between the blade and the top of the package to be differentially displaced.

2. An ejector device, as defined by claim 1, of which the manipulator is of a form such that it may serve as a means of tilting an inserted blade endwise or of rotating it so as to tilt it laterally.

3. A device adapted for use in displacing articles of merchandise while still in the original package in which they were put up and sold, after first opening the top of the package, said device comprising an ejector and an open mounting frame therefor adapted to be assembled as they are applied to a package, the ejector comprising a thin blade which may be thrust through a wall of the package to a position between the bottom of the package and the overlying articles of merchandise, a manipulator for the blade comprising a part of a relatively short extension thereof adapted to project but a short distance from the wall of a package in which the blade has been inserted, and a neck comprising the part of the extension which connects the blade with the manipulator, the component parts of the device being of forms and dimensions such that the neck may have detachable engagement with a part of the mounting frame between the blade and the manipulator when the frame and the ejector have been assembled with each other and with a package, the manipulator affording means accessible from the exterior of the package whereby the blade may be tilted, with respect to its mounting frame, and with respect to a package with which the parts of the device may be assembled, and thereby variably displace the articles which overlie the blade within the package.

4. A device, as defined by claim 3, of which the interengaging parts of the ejector and its mounting frame are of relative forms and dimensions such that when assembled with each other and with a package, the ejector may be tilted either endwise or laterally, as by a partial rotation, or both at the same time, whereby the articles may be differentially displaced in various ways.

5. A device, as defined by claim 3, of which the frame includes a hinged top and means for yieldingly restraining the opening movement of the top so as to cause it to resist the displacement of the articles by the tilting of the blade, and thereby insure a prescribed differential displacement.

6. A device, as defined by claim 3, of which the frame is of a size and construction such that it may be applied to a commercial package of cigarettes, the frame having slender package-attaching portions adapted to be slipped endwise between layers of the wrapping material of the package.

7. A device, as defined by claim 3, of which the frame is of a size and construction such that it may be applied to a commercial package of cigarettes, the frame including a base, a cover and slender intervening connecting portions adapted to be slipped endwise between layers of the package wrappings, the connecting parts of the frame being readily attachable to and detachable from the adjacent part of the frame at one end to facilitate the assembling of the parts of the device with a package.

8. A device, as defined by claim 3, of which the frame includes a pivoted top and means for frictionally opposing the opening of the top, and of which the blade may be tilted in an angular direction corresponding with the angular opening movement of the top, whereby the displacement of the articles, which occupy the space within a package to which the device may be applied, ex-

tending from the blade to the top, may be partially opposed by the top as the blade is tilted and thereby prevent the over-displacement of some of the articles due to frictional engagement with others.

5 9. A device, as defined by claim 3, of which the frame includes readily attachable and detachable parts including a base, a pivoted top, and intervening supports for the top, and of which the
10 device as a whole includes a readily attachable and detachable operating connection between the ejector and the top.

10. A device, as defined by claim 3, of which the frame includes readily attachable and detachable parts including a base, a pivoted top,
15 and intervening supports for the top, and of which the device as a whole includes a readily attachable and detachable operating connection between the ejector and the top, and a spring to
20 operate the connected parts.

11. A device, as defined by claim 3, of which the frame is of a size and construction such that it may be applied to a commercial package of cigarettes, the interengaging parts of the ejector
25 and the frame being of relative forms and dimensions such that, when assembled with each other and with a package, the ejector may be tilted to a position which is oblique to all four of the vertical walls of the package so as to dis-
30 place the overlying cigarettes differentially along lines parallel with each of said walls.

12. An ejector device for displacing cigarettes from their normal position within an original container, said device comprising an elongated ejector
35 blade adapted to be inserted through a wall of the container and when in normal position to lie adjacent and substantially parallel to the ends of the cigarettes, and external actuating means connected to said ejector blade through a wall of
40 the container and adapted to rock said blade about an axis substantially parallel to its longer axis, the connection between the blade and said external actuating means at the point where it passes through the container wall being of rela-
45 tively small width compared with the width of said blade.

13. An ejector device for cigarettes packed in a paper, foil or other original container, said device comprising a thin and substantially rigid

plate-like ejector element insertable through a wall of the container between the ends of the cigarettes and the container bottom, the thinness of the said ejector element being such as to permit of its insertion within the container without materially disturbing the disposition of the cigarettes as normally packed therein, external actuating means for inclining said element, and a frame detachably holding said ejector element in operative relationship with said container.

14. An ejector device for displacing articles packed in an original container, said device comprising an ejector element insertable within said container and beneath the articles while said articles are held by the container, an actuating
15 member external to said container, a connecting part between said member and the ejector element, said part extending through a wall of the container and transmitting movement from said actuating member to said ejector element, and a
20 frame detachably holding said ejector element in operative relationship with said container.

15. An ejector device for displacing cigarettes from their normal position within an original container, said device comprising a frame adapted to hold the original container, a thin flat
25 ejector blade movably supported in said frame, said blade being so formed as to permit of its insertion within the lower end of the container without materially disturbing the original packed
30 position of the cigarettes in said container, spring means interposed between the said frame and said ejector blade, and manually releasable restraining means normally holding said blade in inoperative
35 position, the manual release of said restraining means permitting the blade to be moved relative to the said frame and container by the action of the said spring means whereby the blade is shifted into cigarette ejecting position.

16. The device according to claim 15, further
40 characterized in that the said ejector blade is provided with an extension which projects outside a wall of the container, said extension being formed as a finger grip whereby to permit the manual alteration of the position of the ejector
45 blade whenever the said blade is free from the holding action of the said restraining means.

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