

Dec. 1, 1964

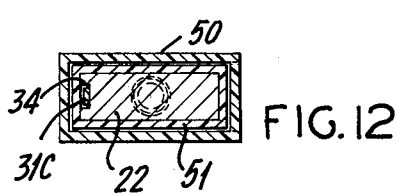
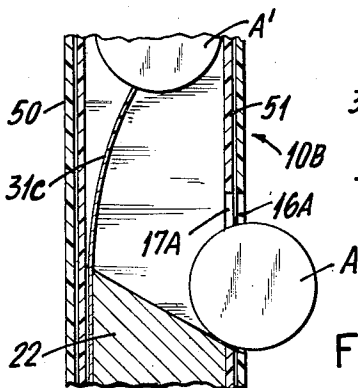
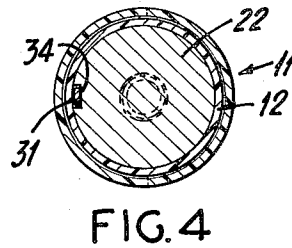
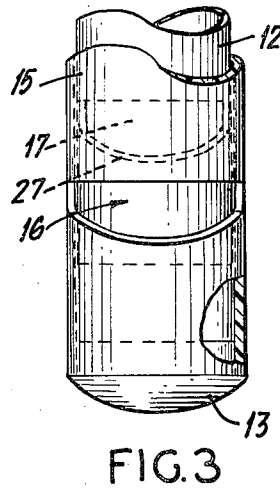
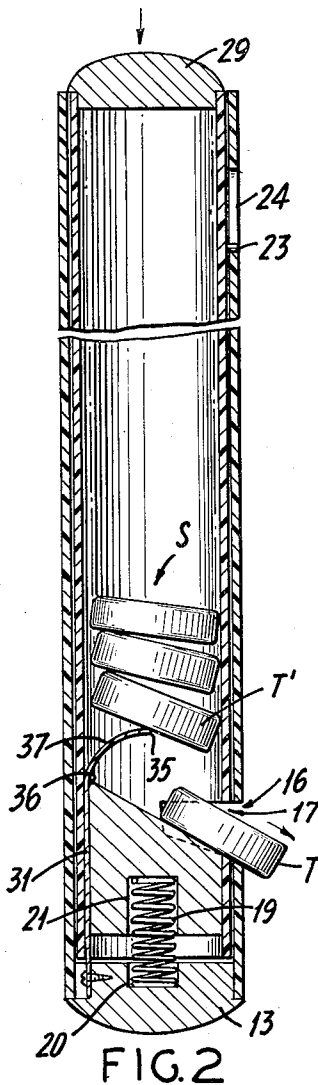
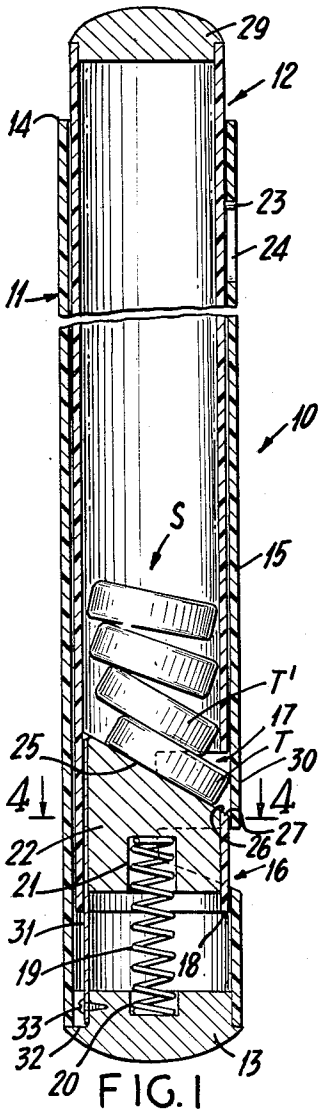
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ARTICLE DISPENSING DEVICE COMPRISING A PAIR OF TUBULAR MEMBERS

Filed May 14, 1963

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

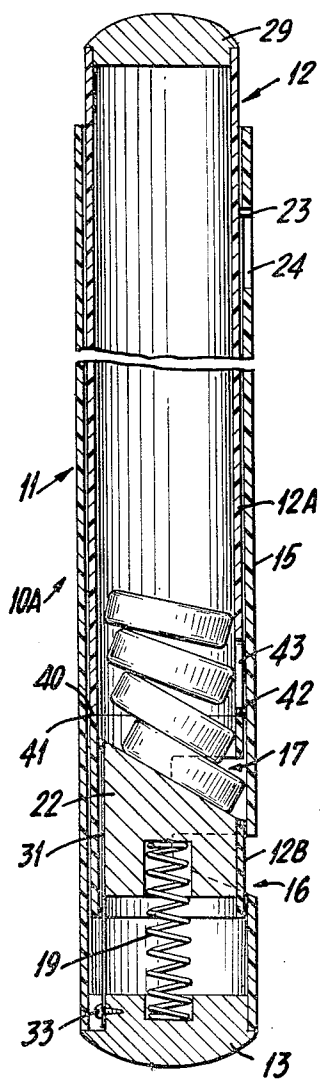


FIG. 5

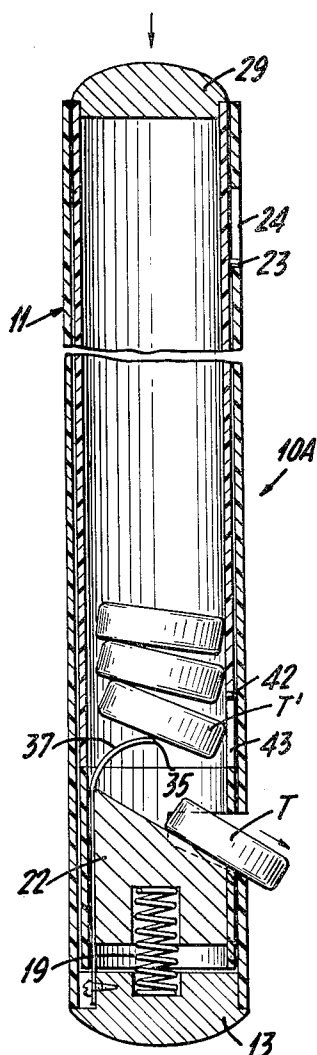


FIG. 6

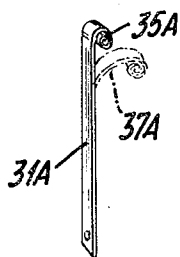


FIG. 7

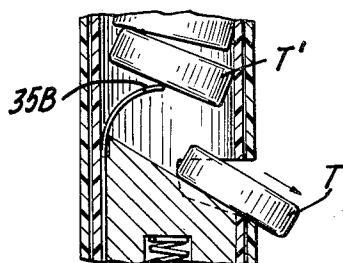


FIG. 9

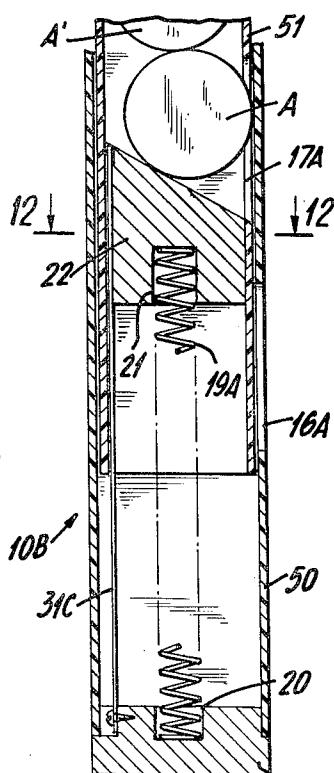


FIG. 10

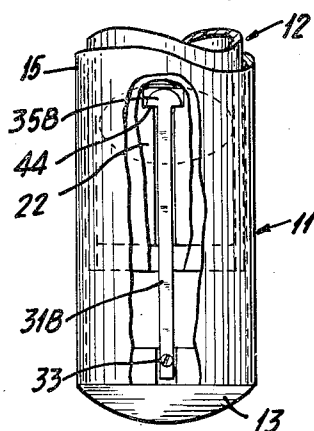


FIG. 8

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1

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ARTICLE DISPENSING DEVICE COMPRISING A PAIR OF TUBULAR MEMBERS

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Filed May 14, 1963, Ser. No. 280,210
9 Claims. (Cl. 221-289)

This invention relates to article dispensers, and more particularly concerns a device for carrying a stack of small articles such as pills, candies or the like, and adapted to dispense individual articles as required.

An object of this invention is to provide an improved dispensing device which takes a slim, elongated, pencil like form, allowing the same to be carried conveniently in a pocket; and including improved mechanism for ejecting individual articles from a column of articles within the device, as desired.

Another object of this invention is to provide an improved article dispensing device which is of simple construction and is made of a minimum number of parts, thereby materially reducing cost of manufacture.

A further object of this invention is to provide in a dispensing device of the character described, novel means for supporting a column of articles while the bottom-most article of the column is being dispensed; such supporting means being of a character which leaves the device in a slim compact form.

Still another object of this invention is to provide a compact device for dispensing articles and adapted to handle articles of slightly varying sizes; the dispensing mechanism being of reduced bulk, thereby enlarging the article carrying capacity of the device.

Yet another object of this invention is to provide an improved article dispenser wherein the stack of articles to be dispensed are held in the actuating portion of the device thereby eliminating the need for holders or separate cartridges.

Still another object of this invention is to provide in a device of the character described, a combination article holding member and actuating member; such combination member when emptied being replaceable by a similar combination member.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

In the drawings, FIG. 1 is a vertical sectional view of an article dispensing device embodying the invention, and showing the elements thereof in a non-dispensing relation;

FIG. 2 is a vertical sectional view similar to that of FIG. 1, showing the elements thereof in a dispensing relation;

FIG. 3 is a partial front elevational view showing the lower dispensing end of the device;

FIG. 4 is a transverse sectional view taken on the line 4-4 of FIG. 1;

FIG. 5 is a vertical sectional view similar to that of FIG. 1, and showing a modified form of the invention;

FIG. 6 is a view similar to that of FIG. 5, showing the elements thereof in dispensing relation;

FIG. 7 is a perspective view showing a modified form of an element of the device;

FIG. 8 is a partial rear elevational view of the lower portion of the device, with parts broken away and showing another form of an element thereof;

FIG. 9 is a partial, side elevational view in section showing the supporting element indicated in FIG. 8, in operative position;

FIG. 10 is a partial vertical sectional view of a device embodying the invention and showing an alternative form thereof;

FIG. 11 is a partial vertical sectional view similar to

2

that of FIG. 10, showing the elements thereof in dispensing relation; and

FIG. 12 is a transverse sectional view taken on the line 12-12 of FIG. 10.

The device of the instant invention comprises essentially a pair of coaxial, telescoped tubular members wherein the inner member carries a stack of pills, candies or other articles to be dispensed and may be reciprocated within the outer member between normal, non-dispensing position and its dispensing position. The tubular members are formed with dispensing openings which register when the inner member is depressed relative to the outer member, to allow the lowermost article of the stack to pass outwardly through the registered dispensing openings, by gravity.

The device further includes an elongated element whose upper end provides means for supporting the stack of articles while the lowermost article is being dispensed; such supporting means becoming automatically operative only when the inner member is depressed to its dispensing position.

Thus, as shown in FIGS. 1-4, 10 designates a device embodying the invention for dispensing various articles including pills, candies or the like. As shown, the articles to be dispensed are indicated in stack form and are typical medicinal pills or tablets such as aspirin, or sacharin tablets.

Device 10 comprises a pair of coaxially and reciprocally related tubular members 11, 12 which are shown in cylindrical form. The outer member 11 is closed at its lower end by a plug 13 and is open at its upper end 14 to receive the inner member 12. The wall 15 of the outer member 11 is formed with a dispensing opening 16, FIGS. 1, 3 with a configuration and dimensions to readily pass the lowermost tablet T of the stack of tablets S carried in the inner member 12; such dispensing opening being located adjacent the closed end of member 11.

The inner member 12 is also formed with a dispensing opening 17, similar in size and configuration to opening 16, and being located adjacent the lower end 18 of said member 12. The inner member 12 is slidably related to the outer member 11 and is urged outwardly thereof to a normal, rest position, as indicated in FIG. 1, by a vertically positioned spring 19 received at its lower end in a central recess 20 formed in plug 13 and at its upper end in a central recess 21 formed in an abutment member 22 fixed in the lower portion of inner member 12.

The movement of the inner member 12 relative to the outer member 11 outwardly thereof is limited by a stop 23 projecting radially from the outer surface of the wall of inner member 12 and moving in a vertical slot 24 of limited extent formed in wall 15 of the outer member 11.

The abutment member 22 has an inclined, flat upper surface 25, the lower edge 26 thereof coinciding with the lower edge 27 of the dispensing opening 17 of the inner member 12. As shown in FIGS. 1, 2, the tablets of stack S tend to arrange themselves in positions inclined to the axis of the members 11, 12; the lowermost tablet T resting on surface 25 in the elevated, rest position of member 12.

The inner member 12 is filled with the tablets forming stack S from its upper end 28, the member 12 then being closed by a plug 29. Plug 29 may be permanently secured in place or may be removable to allow for refilling the member 12.

It will be apparent that upon depressing the inner member 12 with respect to outer member 11, the lowermost tablet T which has been resting on the inclined abutment surface 25 with its forward edge projected through

dispensing opening 17 and stopped by the wall portion 30 of the outer member 11, as shown in FIG. 1; will pass outwardly of the device 10 through the registering dispensing openings 16, 17, as shown in FIG. 2. Upon release of the depressed inner member 12, spring 19 will be effective to restore the inner member 12 to its elevated, normal position.

Means is provided for automatically supporting the stack of tablets S while the lowermost tablet T is being dispensed. To this end, an elongated flat resilient member 31 is mounted in an upright position along the inner surface of the inner member 12, the lower end thereof being anchored in a recess 32 formed in plug 13, as by a screw 33.

The abutment member 22 is formed with a longitudinally extending slot 34 to freely pass the intermediate and upper portions of resilient member 31. Resilient member 31 tends to roll into a helix by reason of its springiness in a manner similar to that of a watch spring. However, the length of member 31 is such that with the inner member 12 in its normal, raised position, the upper free end 35 of member 31 is substantially coextensive with the upper edge 36 of the abutment member 22, thus restraining the upper free end portion of member 31 from its tendency to curl and thereby extend radially toward the axis of members 11, 12.

Thus, as member 12 is depressed toward its dispensing position, the upper free end portion 37 of spring member 31 is exposed and resiliently deflects in a radial direction to bring the free end 35 thereof into a position to abut the under surface of tablet T' of stack S, as shown in FIG. 2, thus supporting stack S while tablet T is being dispensed. The normal displaced relationship of tablets T and T' allows the spring end 35 to locate itself progressively in a position to engage the undersurface of tablet T' at a mid portion thereof to provide support for stack S.

In an alternative embodiment of the invention, shown in FIGS. 5, 6; the inner tubular member 12 is split transversely into an upper section 12A and a lower section 12B with the lower edge 40 of upper section 12A abutting the upper edge 41 of lower section 12B. Thus, the upper section 12A may constitute a replaceable cartridge or magazine to be prepackaged with selected tablets, candies or the like, with a temporary closure of cellophane or the like, not shown on the lower open end thereof.

Thus, an empty section 12A may be withdrawn from the outer tubular member 12, depressing the flexible walls thereof to pass the stop 23; and replacing the same with a new filled section 12A after the temporary bottom closure is removed.

The operation of device 10A, shown in FIGS. 5, 6 is the same as in the case of device 10 previously described; the sections 12A, 12B moving as a unit when depressed and elevated by spring 19. However, a stop 42 projects radially inward from the inner surface of wall 15 of the outer member 11 to limit the outward movement of the lower section 12B. Section 12A is formed with a vertical slot 43 opening at its lower end on bottom edge 40 of said section 12A, to clear the stop 42 when the sections 12A, 12B are depressed to their dispensing position, FIG. 6. The support member 31 operates automatically to bring end 35 thereof into support position relative to tablet T' in the manner previously described.

In FIG. 7 is shown an alternative form of the springy support member 31A, which terminates at its upper end in a rolled portion 35A which presents a curved contact surface in respect to the tablet, etc. to be supported when end portion 37A is biased radially inward as previously described, thus avoiding chipping or scratching the engaged undersurface of the tablet or other article being dispensed.

Another form of the springy support element is shown in FIGS. 8, 9, wherein the elongated flat spring member 31B terminates at its upper end in a semicircular portion 35B, thus providing laterally disposed edges which

engage shoulder 44 at the upper end of slot 34 in abutment member 22 when the inner member 12 is in its raised non-dispensing position. It will be apparent that in addition to its supporting function, member 31B provides stop means for limiting the upward movement of the inner member 12.

The combination support and stop member 31B may be used with sectionalized inner member 12, in which case, the lower section 12B is limited in its upward movement by the stop action of member 31B. In either case, when inner member 12 or section 12B is depressed, member 31B will have its upper portion deflect radially inward to bring portion 35B into engaging relation with tablet T', as shown in FIG. 9, supporting the stack of tablets while tablet T is dispensed.

A further embodiment of the invention is shown in FIGS. 10-12, wherein the tubular coaxial members 50, 51 are of rectangular cross-section to accommodate in the inner member 51 a stack of tablets disposed in vertical edge to edge relation. With member 51 in its raised, rest position, the lowermost tablet A is resting on abutment 22 and projecting through dispensing opening 17A and abutting the wall portion of the outer member 50.

The springy support member 31C is somewhat longer than members 31, 31B, to allow for the somewhat greater travel of the inner member 51 relative to member 50 between non-dispensing and dispensing positions. However, with the tablets in edge to edge relation and closely confined by the opposed walls of member 51, the terminal upper end of support member 31C need deflect inwardly a short distance to a point short of the axis of the member 51, as shown in FIG. 11, to provide adequate support of the stack of tablets. In this case, dispensing opening 17A is in registry with dispensing opening 16A to allow tablet A to move out by gravity relative to the inclined supporting surface of abutment member 22.

It will be apparent, that with tablet A' closely confined in inner member 51, the supporting means may have little or no radial deflection and still be in a position to engage a circumferential edge portion of tablet A' so as to support the stack within member 51, while leaving the bottommost tablet A sufficient clearance relative to the supporting member, as indicated in FIG. 10, to allow said lowermost tablet A to be dispensed in a convenient manner. The spring 19A provides the means for reciprocating inner member 51 relative to outer member 50, in the manner previously described.

The coaxially related tubular members may be formed of thin metal tubing, molded plastic or the like. The plugs 13 and 19 may also be formed of plastic or other suitable material.

As various changes might be made in the embodiments of the invention herein disclosed without departing from the spirit thereof, it is understood that all matter herein shown or described shall be deemed illustrative and not limiting except as set forth in the appended claims.

What is claimed is:

1. An article dispensing device comprising a pair of coaxial, slidably related tubular members, closure means for one end of the outer member, spring means between said closure means and the end of the inner member adjacent said one end of the outer member for restoring the inner member to a normal rest position after said inner member has been depressed within said outer member, said inner and outer members having dispensing openings in wall portions thereof, said openings being in offset relation when said inner member is at its rest position and in registering relation when said inner member is in a depressed position, said inner member being adapted to carry a stack of articles to be dispensed, abutment means at the lower end of the dispensing opening of the inner member for supporting said stack of articles, and coilable strip spring means having one end anchored to said outer tubular member, and means on said abutment member and said inner tubular member for confining

said coilable strip spring means in an uncoiled, flat condition and varying the extent of the radial deflection of the free end thereof in accordance with the position of said inner member relative to said outer member, whereby in the depressed position of said inner member, the free end of said coilable spring means is positioned to engage the next most lowermost article in said stack of articles to support said stack of articles while the lowermost article is being dispensed through the registering dispensing openings of said tubular members.

2. An article dispensing device as in claim 1 wherein said tubular members are of rectangular cross section, said articles being of circular shape and disposed in edge to edge relation, and the free end of said second mentioned spring means being located in offset relation to the axis of said tubular members for eccentric engagement with the edge of the next most lowermost article of said stack of articles to support the same while the lowermost article is being dispensed.

3. An article dispensing device as in claim 1 wherein said inner tubular member comprises longitudinally related sections having abutting edge portions, the abutment means being disposed in the lower section of said tubular member, stop means for limiting the travel of the inner tubular member upon depressed movement thereof, and stop means for limiting the travel of the lower section of said inner tubular member.

4. An article dispensing device as in claim 3 wherein the upper section of said inner tubular member provides means for carrying the stack of articles and said upper section is adapted to be removed from the outer tubular member when the articles carried therein are exhausted, to allow replacement with a similar upper tubular section filled with a stack of articles.

5. An article dispensing device comprising a pair of telescopically related tubular members, closure means for the oppositely disposed outer open ends of said tubular members, closure means for the inner end of the inner tubular member, said tubular members being formed with dispensing openings in wall portions thereof, spring means for urging the inner tubular member to a raised rest position relative to the outer tubular member wherein the dispensing openings of said tubular members are in displaced relation to each other, the closure means for the inner end of the inner tubular member including abutment means for supporting a stack of articles within said inner tubular member, said inner tubular member being depressible from said rest position to a dispensing position wherein the dispensing openings of said tubular members are in registry to allow the bottommost article of said stack of articles to pass outwardly through said registering dispensing openings, and means for supporting the stack of articles immediately above said bottommost article while the bottommost article is being dispensed, said supporting means comprising a resilient coilable strip which tends to coil when said strip is in an unrestrained condition, said strip being arranged to be restrained and disposed in a flat inoperative condition when said inner tubular member is in its normal rest position,

said strip being progressively unrestrained from one end thereof toward the other end thereof as said inner tubular member moves from its rest to its dispensing position, said unrestrained portions of said strip tending to coil and to bring the outer end thereof toward the axis of said inner tubular member and in supporting engagement with the stack of articles immediately above said bottommost article, said coiled end portion of the strip being restored to its uncoiled, inoperative condition in response to movement of said inner tubular member from its dispensing position to its rest position.

6. An article dispensing device as in claim 5 wherein the free end of the coilable strip includes stop means engageable with a shouldered portion of said abutment means to limit the movement of the inner tubular member outwardly of the outer tubular member.

7. An article dispensing device as in claim 5, wherein said coilable strip is anchored at one end to said outer tubular member and extends longitudinally along the inner surface of said inner tubular member, the closure means for the inner end of the inner tubular member including portions thereof for confining the free end portions of said anchored coilable strip in a flat condition against the inner surface of said inner tubular member, the free end of said coilable strip automatically extending radially inwardly toward the axis of the inner tubular member as the inner tubular member is depressed toward its dispensing position to thereby bring the free end of said coilable strip between the lowermost article and the article immediately above the lowermost article in said stack of articles.

8. An article dispensing device as in claim 7 wherein said abutment means includes an inclined surface on the inner end of the closure means for the inner end of the inner tubular member, said inclined surface extending at its lower end to the dispensing opening in the inner tubular member, the free end of the coilable strip in its totally restrained condition being immediately below the upper end of the inclined abutment surface when said inner tubular member is in its rest position, said free end of the coilable strip coiling about the upper end of the inclined abutment surface as said inner tubular member is depressed toward the dispensing position thereof.

9. An article dispensing device as in claim 8 wherein said closure means for the inner end of the inner tubular member is formed with a shallow, longitudinal slot extending from the outer end thereof to the upper end of the inclined abutment surface for receiving the coilable strip therein, said strip and the slotted closure member being further operative to prevent relative rotation of said inner and outer tubular members.

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