United States Patent [19]

Seil

[11] **3,847,162**

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[54] **APPARATUS FOR INJECTING A FLUID INTO A PACKAGE OF CIGARETTES**

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[73] Assignee: **The Liberty Tool & Die Co.,** Cleveland, Ohio

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[21] Appl. No.: **410,341**

[52] **U.S. Cl.** **131/133,** 141/70, 141/261, 141/329

[51] **Int. Cl.** **A24c 05/60**

[58] **Field of Search** ..... 21/73; 131/133 R, 13 X; 118/401, 35; 77/65; 221/270; 222/275; 141/70, 261, 329, 258

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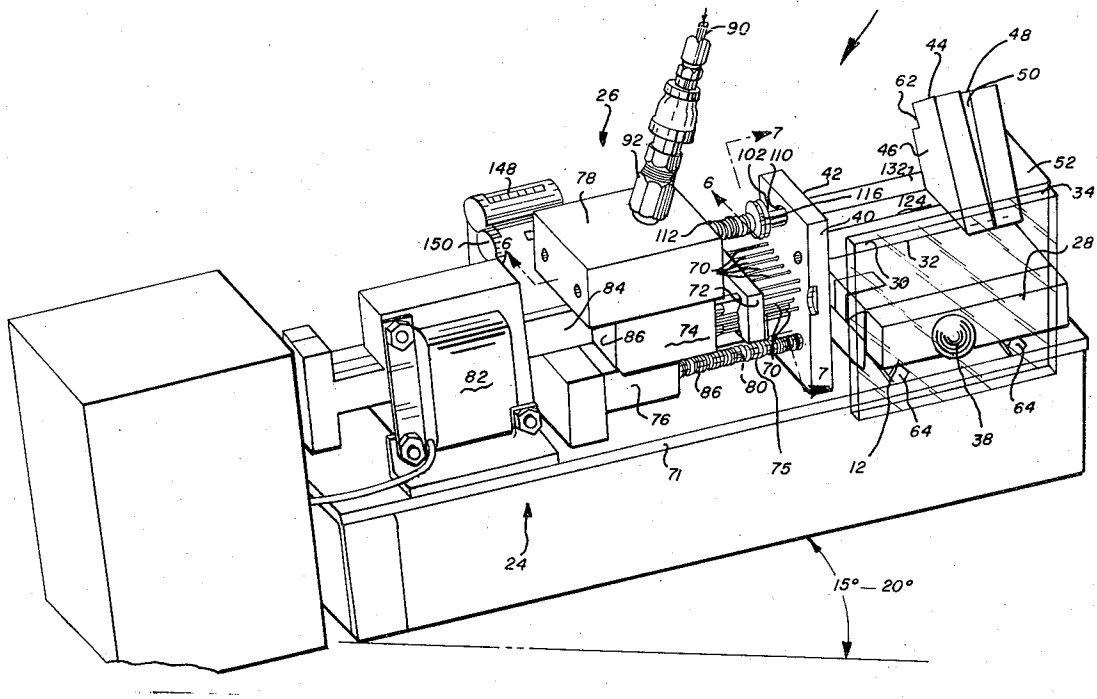
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Primary Examiner—Melvin D. Rein
Attorney, Agent, or Firm—Isler & Ornstein

[57] **ABSTRACT**

An apparatus for injecting a fluid simultaneously into each of the plurality of cigarettes in a package of cigarettes includes, means for positioning the package of cigarettes in a predetermined position, a fluid supply, and a plurality of hypodermic needles arranged to penetrate each cigarette in the package insitu when the package is positioned in its predetermined position. A pump means interconnects the fluid supply and the needles and measures a predetermined amount of fluid from the fluid reservoir and directs the predetermined amount of fluid through the needles to the interior of the cigarettes. The plurality of needles are commonly supported for movement between a first position in which the needles are spaced apart from a positioned package of cigarettes and a second position in which the needles penetrate the package and engage each individual cigarette to inject the fluid therein. A solenoid is provided to effect movement of the needles from the first to the second position. After the package has been positioned the solenoid is engaged to move the needles into their penetrating second position and inject the fluid into the positioned package of cigarettes. The solenoid is then deenergized and the needles removed from the package after the fluid has been injected. The injection of the fluid into the cigarettes provides a cigarette in which a major portion of the harmful constituents in the cigarette smoke are rendered non-toxic to the smoker.

14 Claims, 8 Drawing Figures



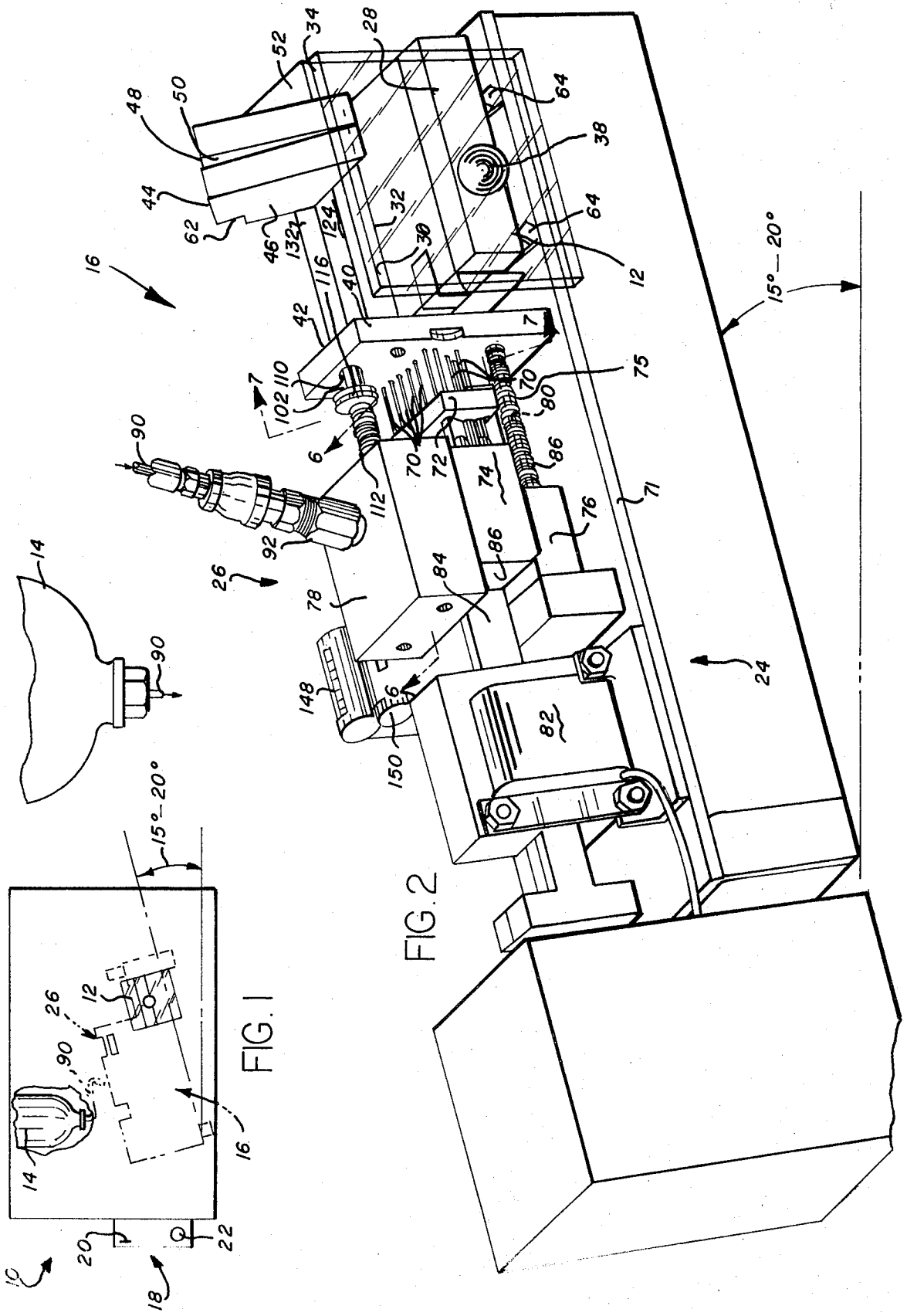

10
12
14
16
18
20
22
26
90
15°-20°

FIG. 1

12
14
16
24
26
28
34
38
42
44
46
48
50
52
62
64
71
72
74
75
76
78
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82
84
86
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92
110
112
116
124
132
148
150
15°-20°

FIG. 2

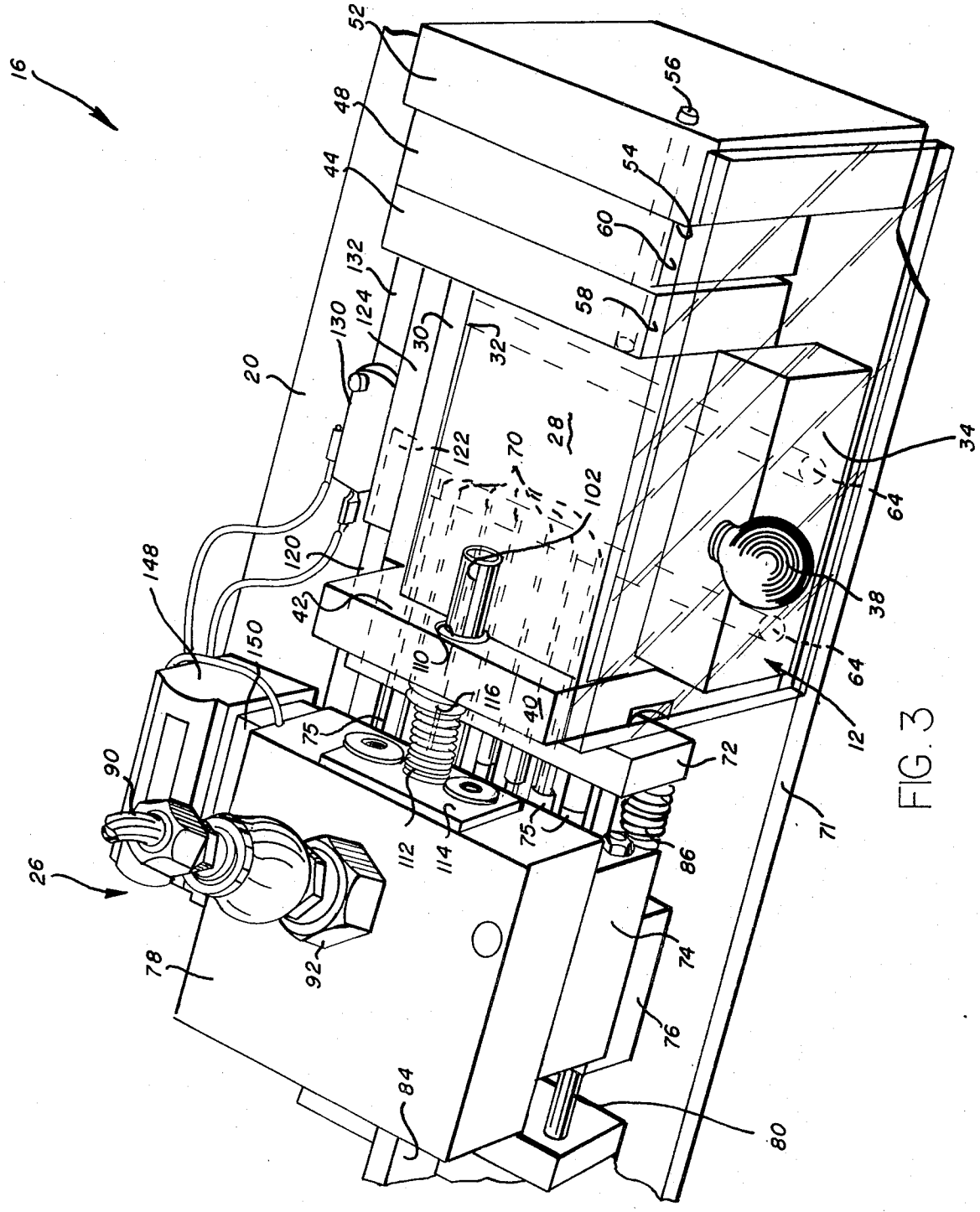

16
52
56
48
44
54
60
58
132
124
130
30
32
20
28
122
70
102
34
64
38
120
148
42
150
110
116
40
12
75
72
90
71
26
112
114
86
78
92
74
76
84
80

FIG. 3

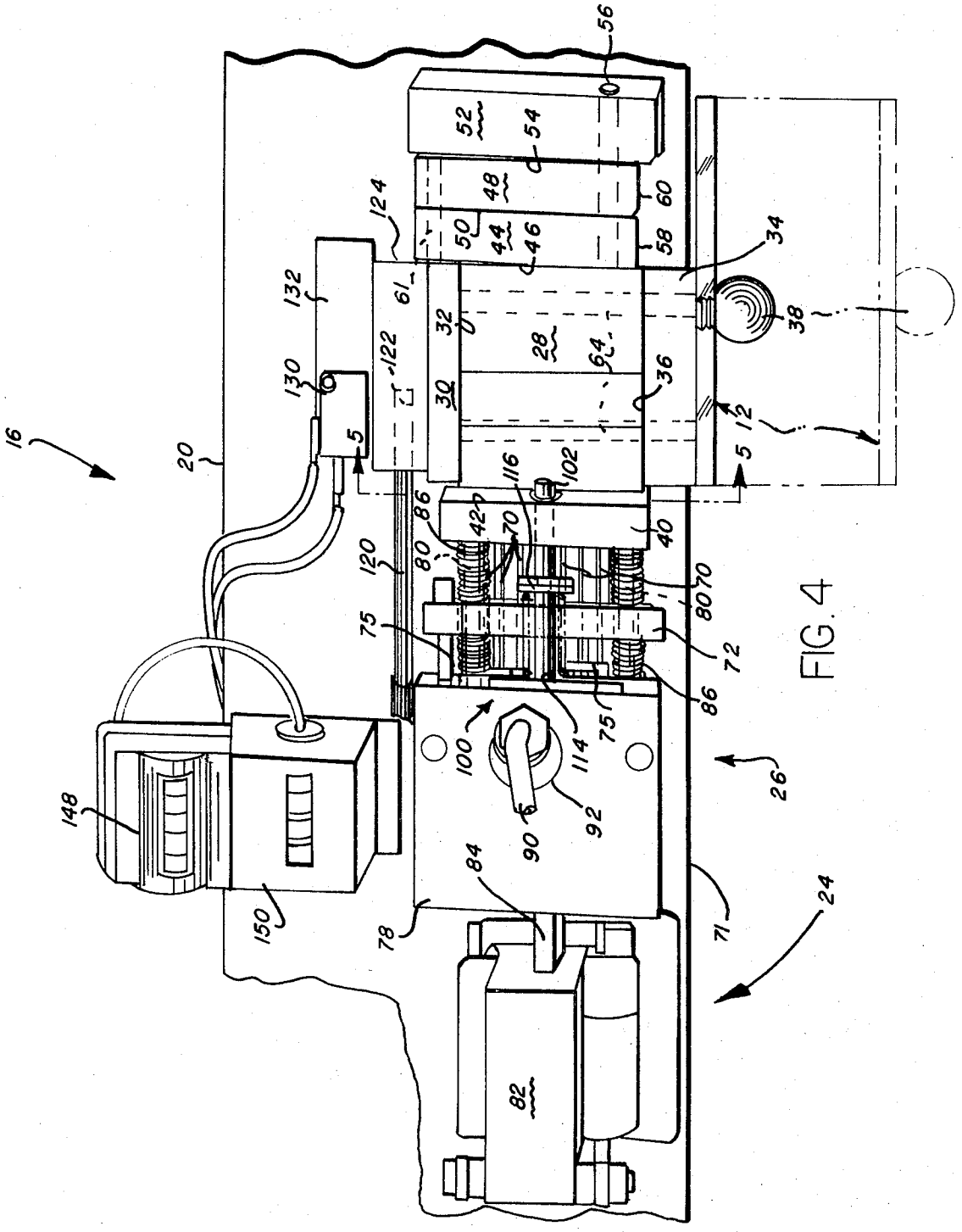

16
20
56
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124
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44
46
58
34
132
61
32
28
64
38
130
122
30
36
5
12
102
116
86
42
70
40
120
80
80
70
75
72
86
75
100
114
26
148
92
90
84
150
78
71
24
82

FIG. 4

FIG. 6

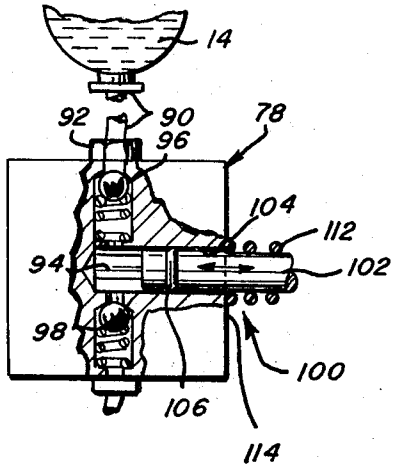


FIG. 5

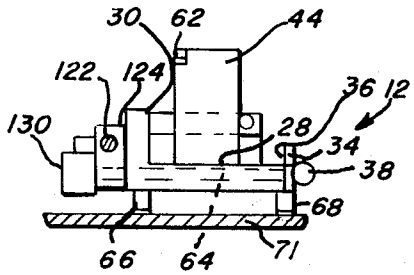
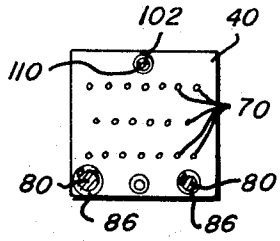


FIG. 7



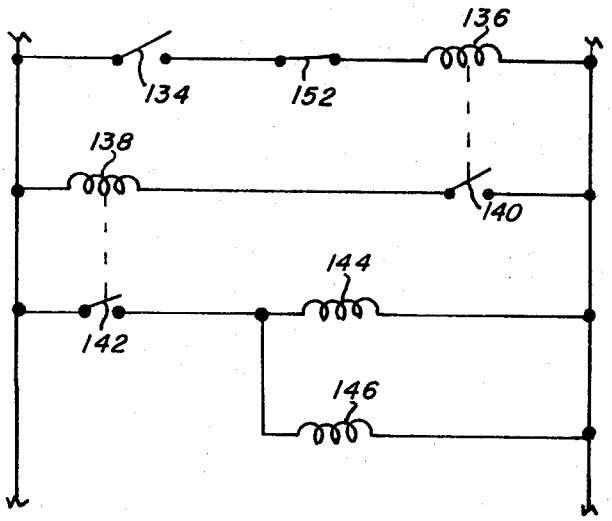


FIG. 8

APPARATUS FOR INJECTING A FLUID INTO A PACKAGE OF CIGARETTES

BACKGROUND OF THE INVENTION

The present invention relates to an apparatus for simultaneously injecting a fluid into a plurality of positioned articles and more specifically to an apparatus for simultaneously injecting a predetermined amount of fluid into a plurality of cigarettes in a positioned package of cigarettes.

The presence of harmful constituents in tobacco smoke which renders the smoke harmful to a smoker has long been recognized. Removal or neutralizing of the harmful constituents in the tobacco smoke to render the smoke safe has generated many unique solutions. One promising solution involves addition of a fluid to the tobacco prior to smoking. The addition of a fluid such as that disclosed in the Martins patent, U.S. Pat. No. 3,490,462, issued Jan. 20, 1970, reduces the harmful constituents in the tobacco smoke that reaches the smoker. However, in the past, means for conveniently and economically adding liquid to an unsmoked cigarette were not available. It is known to add the fluid to each cigarette as it is removed from the package with an eyedropper. However, this process is both time consuming and unfeasible for large quantities of cigarettes. The present invention contemplates an apparatus for simultaneously injecting a measured amount of fluid into the plurality of cigarettes in a package of cigarettes insitu in a manner which is both convenient and economically feasible. The apparatus includes a fluid supply, means for positioning a package of cigarettes in a predetermined position and a plurality of needles for penetrating the package of cigarettes and injecting the measured amount of fluid simultaneously into each of the cigarettes in the positioned package.

SUMMARY OF THE INVENTION

In accordance with the present invention an apparatus is provided for injecting a predetermined amount of fluid simultaneously into a plurality of positioned articles. The apparatus includes a fluid supply, means for positioning the plurality of articles to be injected and penetrating means for simultaneously directing fluid into the interior of the articles. Actuating means is provided to move the penetrating means relative to the plurality of positioned articles to enable the penetrating means to simultaneously penetrate the articles to inject fluid therein. A pump means is disposed to interconnect the fluid supply and the penetrating means. The pump means measures a predetermined amount Of fluid from the fluid supply and directs the predetermined amount of fluid to the penetrating means when the penetrating means are penetrating the plurality of positioned articles.

The present invention further provides an apparatus for injecting a predetermined amount of fluid into a plurality of cigarettes which have a predetermined positional relationship relative to each other. The apparatus includes a source of fluid, penetrating means for simultaneously penetrating the plurality of cigarettes and pump means for interconnecting the source of fluid and the penetrating means. Means are provided for positioning the plurality of cigarettes in a predetermined position relative to the penetrating means. An actuating means is provided for moving the penetrating means from a first position in which the penetrating means are spaced apart from the plurality of positioned cigarettes to a second position in which the penetrating means engages and penetrates the plurality of cigarettes. After the plurality of cigarettes have been positioned by the positioning means the actuating means is energized to effect movement of the penetrating means into their second position. Movement of the penetrating means to their second or penetrating position effects the flow of a predetermined amount of fluid from the pump means, through the penetrating means, to the interior of the cigarettes. The fluid is then dispersed through the interior portion of each of the plurality of cigarettes so as to prevent the formation of harmful constituents in the tobacco smoke when the cigarette is ignited.

The present invention further provides an apparatus for injecting a predetermined amount of fluid into a plurality of cigarettes as set forth in the next preceding paragraph wherein the penetrating means includes a plurality of hypodermic needles which are commonly supported and arranged to simultaneously penetrate each of the plurality of cigarettes in a package of cigarettes insitu.

DESCRIPTION OF THE DRAWINGS:

FIG. **1** is a front view illustrating the injecting apparatus disposed in a housing for commercial use;

FIG. **2** is a front perspective view of the injecting apparatus with the housing removed and illustrating the tray in a partially withdrawn position;

FIG. **3** is a top perspective view of the injecting apparatus illustrating the apparatus in an actuated condition in which the needles penetrate the cigarette package;

FIG. **4** is a top view more fully illustrating the injecting apparatus with the tray pulled out in phantom lines;

FIG. **5** is a cross-sectional view taken approximately along lines **5—5** of FIG. **4** more fully illustrating the tray for positioning the package of cigarettes;

FIG. **6** is a cross-sectional view taken approximately along lines **6—6** of FIG. **2** more fully illustrating the pump and piston arrangement for measuring and directing fluid to the needles;

FIG. **7** is a cross-sectional view taken approximately along lines **7—7** of FIG. **2** more fully illustrating the needle guide block and the needles; and

FIG. **8** is a schematic diagram of the electrical circuitry for operating the injecting apparatus.

DESCRIPTION OF A PREFERRED EMBODIMENT

Referring to FIG. **1**, an apparatus **10** for injecting a fluid into a package of cigarettes is illustrated. The apparatus **10** includes a tray **12** which may be withdrawn from the apparatus **10** to receive a package of cigarettes therein. After a package of cigarettes has been placed in the tray **12** and the tray **12** returned to its original position, a coin receiving mechanism **18** is actuated. The coin receiving mechanism includes a coin receiver **20** and a coin return **22** which cooperate in a well known manner upon placement of a valid coin in the coin receiver **20.** After a package of cigarettes has been placed in the tray **12** and a coin deposited in the coin receiver **20,** an injecting mechanism **16** is actuated to inject a predetermined amount of fluid from a fluid

supply **14** into each of the plurality of cigarettes in the package of cigarettes insitu. The injection of the fluid, which in the preferred embodiment is a liquid, into the package of cigarettes helps to minimize the harmful constituents in the smoke of the cigarettes when the cigarettes are ignited.

The injecting mechanism **16,** more fully illustrated in FIGS. **2** to **4** includes an actuating mechanism **24,** a penetrating mechanism **26** and the tray or slide **12** for receiving the package of cigarettes. The tray **12** functions to accurately position the package of cigarettes relative to the penetrating mechanism **26.** The positioning of the package of cigarettes is critical in that if a package is not placed in the correct orientation relative to the penetrating mechanism **26,** the penetrating mechanism **26** will not act to simultaneously penetrate all of the cigarettes in the package. After the tray **12** correctly positions the package of cigarettes the actuating mechanism **24** is energized. Energization of the actuating mechanism effects movement of the penetrating mechanism **26** to its position illustrated in FIG. **3** in which the penetrating mechanism **26** penetrates the package of cigarettes to simultaneously inject fluid from the fluid supply **14** into each of the cigarettes in situ.

The tray **12** includes a bottom member **28** which provides a flat plane to support the package of cigarettes. A backplate member **30** having a positioning surface **32** is disposed at right angles to the bottom plate **28** to accurately position the back edge of the cigarette package. A front plate member **34** having a positioning surface **36** is also disposed perpendicular to the base plate **28.** The positioning surface **26** cooperates with the positioning surface **32** to align the package of cigarettes relative to the penetrating mechanism **26.** A suitable handle **38** is attached to the front plate **34** of the tray **12** for moving the tray **12** between its full line and phantom line positions as is illustrated in FIG. **4.**

A plurality of stop members **44, 48,** and **52** are provided for engaging with the bottom of the package of cigarettes to further position the package of cigarettes in the tray **12.** The stop members **44, 48,** and **52** include positioning surfaces **46, 50,** and **54,** respectively. The stop members **44** and **48** are supported on a pivot rod **56** for rotation. The stop members **44, 48,** and **52** add versatility to the device in that they cooperate to position any of the three standard sizes of cigarettes, regular, king-size or 100's, relative to the penetrating mechanism **26.** To this end the stop members **44** and **48** include surfaces **58** and **60,** respectively, for engaging with a package of cigarettes when the package is placed in the tray and the tray is slid to its position shown in full lines in FIG. **4.** If the package of cigarettes is a regular size pack, the package will not engage either of the surfaces **58** or **60** of the stop members **44** and **48,** respectively, and the stop members will remain in their position illustrated in FIG. **4** so that when the regular size package is positioned in the tray **12** the bottom of the package will engage with the surface **46** of the stop member **44.** However, if a king-size package of cigarettes is utilized, the surface **58** of the stop member **44** will be engaged by the package when the package is placed in the tray **12** and the tray is slid to its full line positon as shown in FIG. **4.** Engagement of the package of cigarettes with the surface **58** of the stop member **44** will cause the stop member **44** to pivot about the pivot pin **56** to enable the stop surface **50** of the stop member **48** to engage with the bottom of the package of cigarettes. In the event that a 100 mm size package of cigarettes is utilized, as is shown in FIG. **2,** the surfaces **58** and **60** of the stop members **44** and **48** will be engaged by the package of cigarettes when the tray is moved to its fully in position. This will effect pivoting of the stop members **44** and **48** about the pivot pin **56** to enable the base of the package of cigarettes to tightly engage with the stop surface **54** of the stop member **52.**

A needle guide block **40** having a stop surface **42** is provided for engaging with the top end surface of the cigarette package. Thus, when a cigarette package is inserted in the tray **12** and the tray **12** is closed, the cigarette package will be supported by the base plate **28** and accurately positioned by the cooperation of the base plate **28,** the surface **32,** the surface **36,** the surface **42** and one of the stop surfaces **46, 50,** or **54** of the stop members **44, 48,** and **52,** respectively, relative to the penetrating mechanism **26.** A stop rod **61** is provided for supporting the stop members **44** and **48,** when the members are in their unpivoted positions. The stop members **44** and **48** include suitable notches **62** as illustrated in FIG. **2** for engaging with the stop rod **61** when they are in their non-pivoted position.

The tray **12** is supported for movement in a horizontal direction by a pair of slide rods **64.** The slide rods **64** pass through suitable openings in the bottom of the base member **28** of the tray **12** to enable the tray to be moved into and out of position. A stop member **66** is suitably attached to the bottom of the base plate **28** of the tray as is more fully illustrated in FIG. **5.** The stop member **66** is operable to engage with a stop member **68** provided on the base plate **71** of the injector mechanism. When the stop member **66** engages with the stop member **68** upon withdrawal of the tray **12,** further movement of the tray **12** in an outwardly direction is prevented. This prevents the tray **12** from being removed from the machine.

The penetrating mechanism **26** includes a plurality of needles **70** which are supported by a needle support block **72.** The needles **70** are arranged in three rows of seven, six and seven and pass through the openings of the needle guide block **40** when the penetrating mechanism **26** is actuated. The arrangement of the needles **70** in three rows enables the needles to simultaneously penetrate each of the individual cigarettes in a package of cigarettes which has been positioned on the tray **12.** Each of the needles **70** is connected to the manifold liquid distribution block **74** by suitable connectors **75.** The manifold liquid distribution block **74** is suitable attached to a slide block **76** and a pump block **78.** The manifold liquid distribution block **74,** the slide block **76** and the pump block **78** are rigidly interconnected for movement along a pair of slide rods **80** by the actuating mechanism **26.**

The actuating mechanism **26** includes a solenoid **82** having a plunger **84** which engages with the back surface **86** of the manifold liquid distribution block **74.** Energization of the solenoid **82** effects movement of the plunger member **84** to the right as viewed in FIG. **2.** Movement of the plunger **84** effects movement of the manifold liquid distribution block **74,** the slide block **76** and the pump block **78** to the right to the position illustrated in FIG. **3.** Movement of the pump block **78,** the manifold liquid distribution block **74** and the slide block **76** to the right effects movement of the nee-

dles 70 and needle support block 72 to effect penetration of the cigarette package positioned in the tray 12 by the needles 70. A pair of coil springs 86 are disposed about the slide rods 80. The coil springs 86 engage with the slide block 76 and with the needle guide block 42. Energization of the solenoid 82 and movement of the slide block 76 and needles 70 to the right, as viewed in the figures, effects compression of the springs 86. Upon deenergization of the solenoid 82 the coil springs 86 exert a force to return the slide block 76 to its original position as is illustrated in FIG. 2.

The liquid supply 14 is directed by gravity through a conduit 90 which is suitably connected to the pump block 78 by a connector 92. The pumb block 78 includes a chamber 94 therein, more fully illustrated in FIG. 6, which measures a predetermined amount of liquid from the fluid supply 14 and directs it to the manifold liquid distribution block 86. The chamber 94 is interconnected to the fluid conduit 90 by a one-way check valve 96 and connected to the manifold liquid distribution lock 86 by a one-way check valve 98. The check valve 96 enables fluid to flow only into the chamber 94 and the check valve 98 enables fluid to flow only from the chamber 94.

A piston assembly 100 is provided to exhaust the fliud in the chamber 94 upon movement of the needles 70 to their penetrating position. The piston assembly 100 includes a piston rod 102 having its end disposed within the bore 104 in the pump block 78 which forms the chamber 94. A suitable 0-ring 106 is provided to prevent leakage of fluid from the chamber 94 between the piston rod 102 and the bore 104. The opposite end of the piston rod extends through an opening 110 in the needle guide block 42. A coil spring 112 is positioned between a stop surface 114 disposed on the pump block 78 and a stop member 116 affixed to the piston rod 102.

Upon actuation of the solenoid 82 and movement of the pump block 78 to the right, the piston rod 102 will move to the right as viewed in FIG. 2 until the stop member 116 engages with the needle guide block 40. Engagement of the stop surface 116 with the needle guide block 40 will cause the piston 102 to stop. The pump block 78 will then continue to move to the right under the force of the actuated solenoid 82. Continued movement to the right of the pump block 78 will compress the spring 112 disposed about the piston rod 102 and cause the piston rod 102 to move into the chamber 94 since the opposite end thereof is fixed by the engagement of the stop member 116 and the needle guide block 40. Movement of the piston rod 102 into the chamber 94 forces the fluid therein to be compressed. Since the check valve 96 is a onw-way check valve only allowing fluid flow into the chamber 94, the fluid will flow through the one-way check valve 98 which enables fluid to flow out of the chamber 94 to the manifold liquid distribution block 78 and through the needles 70 which have now penetrated the cigarettes positioned in the tray 12. The interior of the manifold liquid distribution block 86 is not illustrated, however, a known manifold construction could be used in which the fluid flow through the check valve 98 will be equally distributed to all of the needles 70. When the solenoid 82 is deenergized and the springs 86 return the slide block 76, manifold liquid distribution block 74 and the pump block 78 to their original positions and withdraw the needles 70 from the package of cigarettes the spring 112 will exert a biasing force to move the piston 102 out of the chamber 94 to its original position relative to the block 78 which then carries the piston 102 with it. This will enable more fluid to flow from the fluid supply 12 through the conduit 90 and through the check valve 96 into the chamber 94 to condition the injecting mechanism for the next injecting stroke.

It should be appreciated that the location of the stop member 116 on the piston 102 enables the piston to move a predetermined distance with the pump block 78 before the piston 102 moves into the chamber 94 to exhaust the fluid therefrom. Preferably, the total movement of the slide block 76, manifold liquid distribution block 74, pump block 78 and needles 70 is seven-eighths of an inch. During the first half of the seven-eighths inch movement the piston rod 102 moves with the pump block 78 and the needles 70 make initial penetration of the cigarettes. During the second half, or second seven-sixteenth movement, the piston 102 is forced into the chamber 94 to expel the fluid therefrom and cause the fluid to pass from the needles 70 as they further penetrate the cigarettes.

Due to the fact that the fluid flow from the fluid supply 14 through the conduit 90 to the pump block 78 is effected solely under the influence of gravity, it is important that the fluid supply 14 be located higher than the pump block 78 as is illustrated in FIG. 1. The fluid flow through the conduit 90 into the pump block 78 is controlled so that a predetermined amount of fluid is injected from each of the plurality of needles 70. To this end the chamber 94 fills each time the piston 102 is withdrawn on a return stroke of the actuating mechanism. Thus, the chamber 94 acts to meter a predetermined amount of fluid from the fluid supply 14 and deliver the fluid in the chamber 94 when the piston 102 is moved inwardly upon energization of the solenoid 82. The fluid flow from the chamber 94 through the check valve 98 is under a pressure effective by the inward movement of the piston 102 along the bore 104 forming the chamber 94. This injects a predetermined amount of fluid into the manifold liquid distribution block 74. The manifold distribution block 74 always has a predetermined amount of liquid therein and the flow of fluid from the chamber 94 displaces an equal amount of fluid in the manifold distribution block 74 to effect the flow of a metered amount of fluid to the needles 70 to the prepositioned package of cigarettes. To prevent flow of fluid from the manifold liquid distribution block 74 the penetrating mechanism is tilted so that the ends of the needles 70 point in an upwardly direction. This is illustrated in FIG. 1 which shows the penetrating mechanism to be tilted between 15 and 20 degrees from the horizontal plane on which the mechanism rests.

An interlock is provided to interlock the tray 12 with the pump block 78 to prevent movement of the tray 12 when the penetrating mechanism 26 has been moved to the right. To this end a rod 120 is attached to the pump block 78. A support block 124 having a bore 122 therein is attached to the back plate 30 of the tray 12 for sliding movement therewith. The bore 122 in the support block is axially aligned with the interlock rod 120 when the tray 12 is in its innermost position. Actuation of the solenoid 82 and movement of the pump block 78 effects movement of the interlocking rod 120 into the bore 122 of the support block 124. When the

interlocking rod **120** is disposed in the bore **122**, movement of the tray **12** will be prevented.

A normally open micro-switch **130** is disposed on a fixed support **132** which limits the inward movement of the tray **12** by engaging with the support block **124** when the tray **12** is moved to its innermost position. The micro-switch **130** has a normally opened condition and is closed when the support block **124** engages with the actuating arm of the switch when the tray **12** is moved to its innermost position.

The contacts for the normally open micro-switch **130** are illustrated as the contacts **134** in FIG. **8**. The normally open contacts **134** of the micro-switch **130** are disposed in a series circuit with the coin receiver reject coil **136**. A series connection of a time delay relay coil **138** and the coin receiver contacts **140** is disposed in a parallel relationship to the normally open contacts **134** of the micro-switch **130** and the coin receiver reject coil **136**. When a package of cigarettes is placed in the tray **12** and the tray **12** is slide in its innermost position, the normally open contacts **134** of the micro-switch **130** will close thereby energizing the coin receiver reject coil **136**. The coin receiver reject coil **136** must be energized to enable the contacts **140** of the coin receiver to close. When a coin is deposited in the coin slot **20** and the contacts **134** of the micro-switch **130** are closed, the coin receiver contacts **140** will close thereby energizing a time delay relay coil **138**. Energization of the time delay relay coil **138** closes the contacts **142** of a time delay switch which are disposed in series with the coil **144** of the solenoid **82** to thereby energize the solenoid and effect penetration of the needles **70** into the package of cigarettes. The contacts **142** will remain closed for a predetermined time period determined by the timing of the time delay relay to enable the fluid to be injected into the positioned cigarettes. After the time delay relay times out, the relay will automatically deenergize to open contacts **142** thereby deenergizing the coil **144** of the solenoid **82**. Deenergization of the solenoid **82** will effect withdrawal of the needles **70** from the package of cigarettes.

A counter coil **146** is disposed in parallel to the solenoid coil **144** and closing of the contacts **142** of the time delay switch also energizes the counter coil **146**. The counter coil **146** is connected to a pair of counters **148** and **150** more fully illustrated in FIG. **4**. The counters **148** and **150** count the number of actuations of the injecting mechanism **16**. The counter **148** keeps track of the total number of actuations of the machine over an indefinite period of time. The counter **150** acts to limit the number of actuations from a single fluid supply **14**. To this end the counter **150** includes a normally closed set of contacts **152** which are disposed in series with the normally opened contacts **134** and the coin receiver reject coil **136**. When the counter **150** reaches a predetermined count the contacts **152** will be opened thereby preventing further actuation of the device. The counter **150** thus prevents the device from being actuated when the fluid supply **14** is empty. In the preferred embodiment the fluid supply **14** will provide **500** actuations of the penetrating device. After **500** actuations the fluid supply will be empty and the counter will open the contacts **152** to prevent further actuation of the machine.

From the foregoing it should be apparent that a new and improved apparatus has been provided for injecting a predetermined amount of fluid into a plurality of prearranged articles. While in the present instance the articles have been illustrated as a package of cigarettes which are penetrated insitu, it should be appreciated that the present invention could be utilized with a plurality of other types of articles which have been arranged in groups wherein it is desired to inject fluid simultaneously into all of the individual articles in each group. The apparatus for injecting the fluid includes a source of fluid and a penetrating means which in the present instance is a plurality of hypodermic needles for simultaneously penetrating the plurality of cigarettes and injecting a predetermined amount of fluid from the fluid supply therein. The penetrating means is interconnected to the fluid supply by a pump means which includes the pump block and piston assembly. The pump block and piston assembly measure predetermined amounts of fluid from the fluid supply and direct the fluid through the manifold liquid distribution block to the plurality of needles upon actuation of the penetrating device. The penetrating device is moved by an actuating means which in the preferred embodiment is a solenoid which moves the needles from a first position in which the needles are spaced apart from a positioned cigarette package to a second position in which the needles penetrate the cigarettes in the package insitu to simultaneously inject fluid to the plurality of cigarettes therein. Thus, the injecting apparatus provides an economically feasible and reliable means for injecting fluid into a plurality of cigarettes in a cigarette package in situ.

I now claim:

1. An apparatus for simultaneously injecting a fluid into a plurality of positioned articles comprising means for positioning the plurality of articles in a predetermined position, a fluid supply, penetrating means for simultaneously penetrating each of the plurality of positioned articles and directing the flow of fluid from said fluid supply to the interior of the articles, pump means interconnecting said fluid supply and said penetrating means for measuring a predetermined amount of fluid and directing said predetermined amount of fluid to said penetrating means, and actuating means providing for relative movement of said penetrating means and said plurality of positioned articles having a first condition in which said penetrating means is spaced apart from said plurality of positioned articles and a second condition in which said penetrating means penetrates each of the plurality of positioned articles and directs said predetermined amount of fluid to an interior portion of each of the plurality of articles, said pump means measuring a predetermined amount of fluid from said fluid supply and storing said predetermined amount of fluid therein when said fluid actuating means is in said first condition and exhausting the predetermined amount of fluid therefrom and directing said predetermined amount of fluid to said penetrating means when said actuating means is in said second condition.

2. An apparatus for simultaneously injecting a fluid into a plurality of positioned articles as defined in claim **1**, wherein said penetrating means includes a plurality of hollow needles in fluid communication with said pump means for directing said predetermined amount of fluid to the interior of said plurality of positioned articles when said needles have penetrated said positioned articles.

3. An apparatus for simultaneously injecting a fluid into a plurality of positioned articles as defined in claim 2 wherein said penetrating means further includes a movable manifold block for supporting said plurality of needles for movement therewith, a movable slide block for supporting said manifold block for movement therewith, said slide block and said manifold block being movable in a direction substantially perpendicular to the surfaces to be penetrated of the positioned articles by said needles between a first position in which said needles are spaced from the positioned articles and a second position in which said needles penetrate the positioned articles and spring means for biasing said slide block toward said first position.

4. An apparatus for simultaneously injecting a fluid into a plurality of positioned articles as defined in claim 3 wherein said manifold block includes a manifold therein which provides fluid communication between said pump means and said plurality of needles, and further including a needle guide block interposed between said manifold block and the positioned articles for guiding the movement of said needles as said slide block and said manifold block moves between said first and second position.

5. An apparatus for simultaneously injecting a fluid into a plurality of positioned articles as defined in claim 3 wherein said actuating means includes a solenoid having a plunger, said plunger being in engagement with said manifold block and effecting movement of said manifold block and said slide block to said second position upon energization of said solenoid.

6. An apparatus for simultaneously injecting a fluid into a plurality of positioned articles as defined in claim 4 wherein said pump means includes a pump block connected to said manifold block for movement therewith, said pump block having a chamber therein, said chamber having a fluid inlet for receiving fluid from said fluid supply and a fluid outlet for directing fluid to said manifold and a piston assembly mounted for movement into said chamber to force fluid accumulated therein through said fluid outlet to said manifold.

7. An apparatus for simultaneously injecting a fluid into a plurality of positioned articles as defined in claim 6 wherein said piston assembly includes a piston rod having one end disposed in said chamber and the opposite end slidably supported in said needle guide block, a stop member slidably fixed to said piston rod between said needle guide block and said chamber, spring means for engaging said stop member for biasing said piston rod outwardly from said chamber, said piston rod being movable relative to said needle guide block in response to initial movement of said pump block toward said positioned article and being movable relative to said pump block to force fluid from said chamber upon further movement of said pump block toward said positioned articles.

8. An apparatus for simultaneously injecting a fluid into a plurality of positioned articles as defined in claim 1 wherein said means for positioning a plurality of articles includes a tray for receiving articles to be positioned therein and a plurality of stop members for positioning articles placed in said tray relative to said tray and to said penetrating means, at least one of said plurality of stop members being movable between an operative position in which said stop members engage with and position the articles placed in said tray and an inoperative position in which said stop members are ineffective to position the articles in said tray, said stop members being movable between said operative and inoperative position upon movement of said tray to effect engagement of said stop members with articles placed in said tray toward said stop members, said stop members engaging with said articles as said articles are moved by said tray to enable some of said stop members to be positioned in said inoperative position and one of said stop members to be positioned in said operative position depending upon the size of the articles placed in said tray to enable said stop members to position articles of various sizes relative to said penetrating means.

9. An apparatus for injecting a predetermined amount of fluid into a plurality of cigarettes which have a predetermined positional relationship relative to each other comprising, a source of fluid, penetrating means for simultaneously penetrating said plurality of cigarettes and injecting said predetermined amount of fluid therein, pump means for interconnecting said source of fluid and said penetrating means, means for positioning said plurality of cigarettes relative to said penetrating means, and actuating means for moving said penetrating means from a first position in which said penetrating means are spaced apart from said plurality of cigarettes to a second position in which said penetrating means engages and penetrates said plurality of cigarettes, said pump means measuring said predetermined amount of fluid from said fluid supply and storing said predetermined amount of fluid therein when said penetrating means is in said first position and exhausting said predetermined amount of fluid therefrom when said penetrating means is moved to said second position to direct the measured predetermined amount of fluid through the penetrating means to the interior of the plurality of cigarettes.

10. An apparatus for injecting a predetermined amount of fluid into a plurality of cigarettes as defined in claim 9 wherein said penetrating means includes a plurality of hollow needles in fluid communication with said pump means for directing said predetermined amount of fluid to the interior of the plurality of positioned cigarettes when said needles have penetrated said positioned cigarettes, a movable manifold block supporting said plurality of needles for movement therewith, a movable slide block for supporting said manifold block for movement therewith, said slide block, said manifold block and said pump block being movable in a direction substantially perpendicular to the surface of the cigarettes to be penetrated by said needles between said first position in which said needles are spaced apart from said positioned cigarettes and said second postion in which said needles penetrate said positioned cigarettes and spring means for biasing said slide block, said manifold block and said pump block toward said first position.

11. An apparatus for injecting a predetermined amount of fluid into a plurality of cigarettes as defined in claim 10 further including a needle guide block interposed between said manifold block and the positioned cigarettes for guiding the movement of said needles as said slide block moves between said first and second positions.

12. An apparatus for injecting a predetermined amount of fluid into a plurality of cigarettes as defined in claim 9 wherein said pump means includes a pump block operatively associated with said penetrating

means for movement therewith between said first and second positions, said pump block having a chamber therein having a fluid inlet for receiving fluid from said fluid supply and a fluid outlet for directing fluid to said penetrating means and a piston assembly mounted for movement into said chamber to force fluid accumulated therein through said fluid outlet to said penetrating means.

13. An apparatus for injecting a predetermined amount of fluid into a plurality of cigarettes as defined in claim **12** wherein said piston assembly includes a support member, a piston rod having one end disposed in said chamber and the opposite end slidably supported in said support member, a stop member slidably fixed to said piston rod between said support member and said chamber, and spring means engaging said stop member for biasing said piston rod outwardly from said chamber, said pump block and said piston rod being movable relative to said support member in response to initial movement of said pump block toward the positioned cigarettes, said spring means biasing said piston rod to prevent relative movement between said piston rod and said chamber in response to initial movement of said pump block toward said cigarettes, said piston rod being movable relative to said pump block into said chamber to force fluid from said chamber to said penetrating means upon further movement of said pump block toward said cigarettes and engagement of said stop member with said support member.

14. An apparatus for injecting a predetermined amount of fluid into a plurality of cigarettes as defined in claim **9** further including a tray for receiving cigarettes to be positioned relative to the penetrating means, said tray having a cigarette receiving position and a penetrating position in which the cigarettes are positioned in their predetermined position relative to said penetrating means and a plurality of stop members for positioning the cigarettes placed in said tray relative to the penetrating means, said stop members being movable between an operative position in which said stop members engage with and position the cigarettes placed in said tray and an inoperative position in which said stop members are ineffective to position the cigarettes placed in said tray, said stop members being engaged by the cigarettes placed in said tray as said tray is moved from said cigarette receiving position to said penetrating position with the cigarettes disposed therein and enabling said tray to receive and position cigarettes of various sizes therein relative to said penetrating means.

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