Jan. 20, 1959 B. SHARE 2,869,778

COIN COLLECTION SYSTEM

Filed March 25, 1957 2 Sheets-Sheet 1

FIG. 10

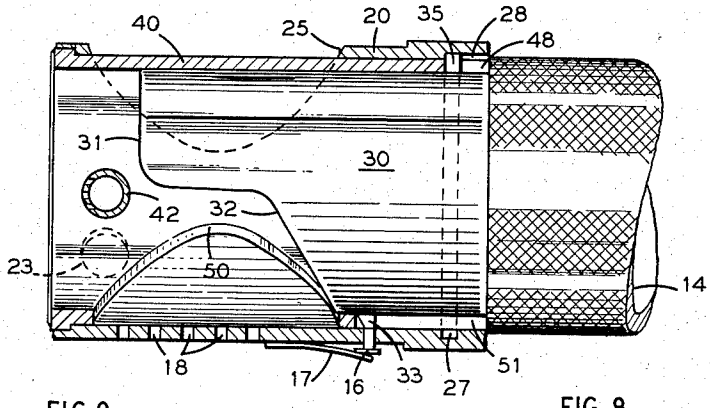


FIG. 9

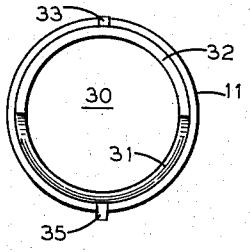


FIG. 8

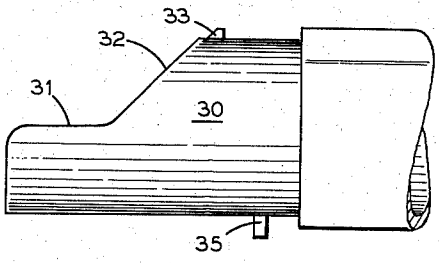


FIG. 1

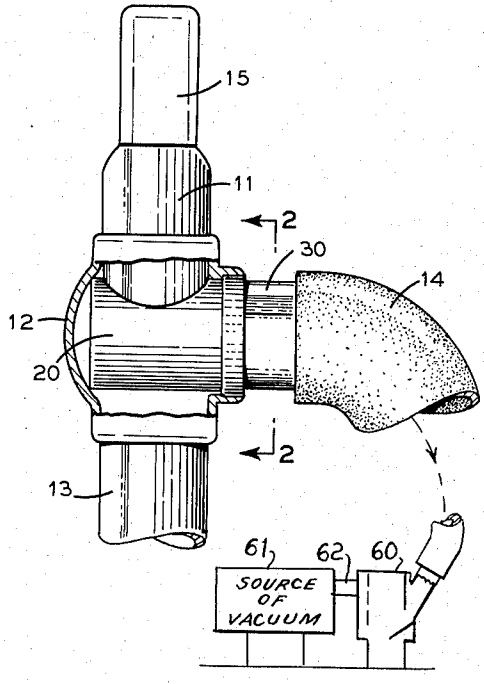
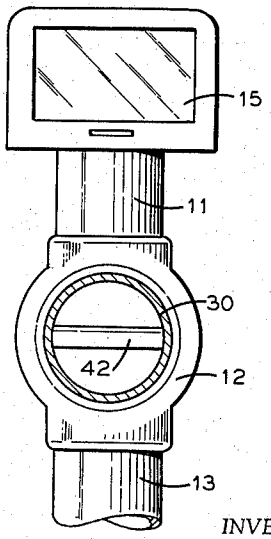


FIG. 2



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Jan. 20, 1959 B. SHARE 2,869,778

COIN COLLECTION SYSTEM

Filed March 25, 1957 2 Sheets-Sheet 2

FIG. 4

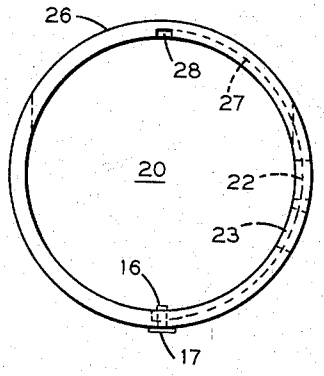


FIG. 3

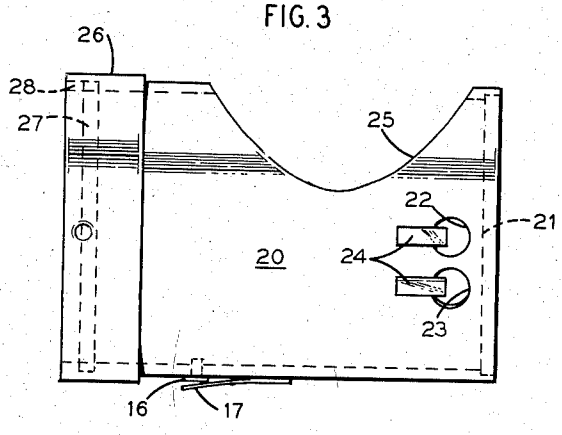


FIG. 6

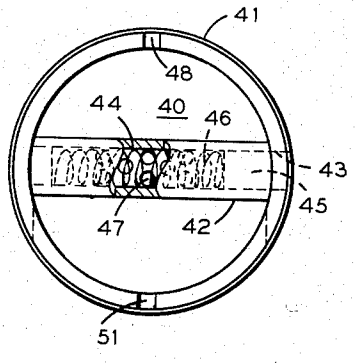


FIG. 5

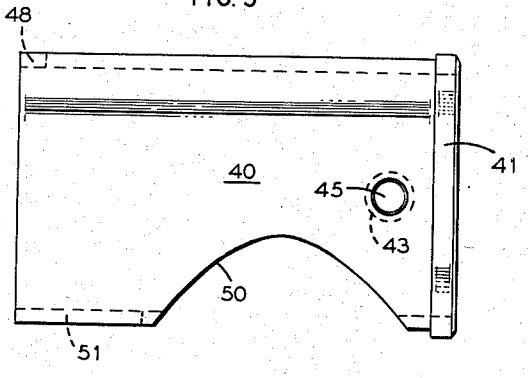
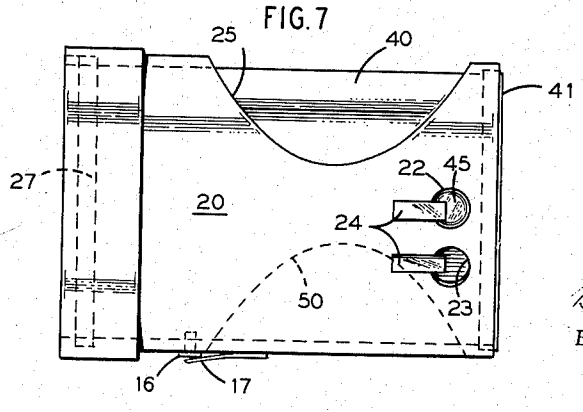


FIG. 7



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COIN COLLECTION SYSTEM

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Application March 25, 1957, Serial No. 648,018

9 Claims. (Cl. 232—16)

This invention relates to coin collection systems and, more particularly, to a novel and simplified coin receiving and collecting arrangement having novel features preventing unauthorized diversion of coins being collected from the receiver.

Coin operated devices are presently used to perform many services hitherto performed manually. For example, while such devices have long been used in turn-stiles to control admissions and in vending machines, their use in these cases is rapidly increasing. A new use, developed over the past few years, has been parking meters for automatically regulating parking time in congested locations.

In very case, such coin devices include not only mechanism operated or controlled by the insertion of one or more coins or tokens of a predetermined denomination but also a receiver for the collected coins. These receivers are secured in position against unauthorized tampering so as to be accessible only to an authorized collector. The latter usually has a suitable key or the like by means of which he can reach the receptacle, remove it, collect the coins therefrom, and replace the receptacle in its security position.

For the most efficient and economical operation of coin controlled or operated devices, it is essential that the man-hours required for collection of coins and maintenance of the devices be kept at a minimum. With present types of coin receptacles, and with methods of collection requiring removal, emptying, and replacement of the coin receptacles, the collection man-hours required per device is unduly high, particularly in the case of parking meters.

In co-pending U. S. application Serial No. 541,338 filed October 19, 1955, for Coin Operated Devices and Methods of Collecting Coins Therefrom, there is illustrated and described a novel coin receiving and collecting arrangement involving a coin receiver which is normally latched in an inaccessible security position, and which is unlatched and moved to a coin discharge and collecting position by connection of a suction or vacuum operated coin gathering device to a housing for the receiver. When the gathering device is disconnected, the coin receiver automatically returns to, and is latched in, its inaccessible coin receiving position.

The present invention is directed to an improved and simplified arrangement of this type comprising a pair of telescopically arranged cylinders mounted to extend at substantially right angles across the lower end of an upright pipe having an open upper end supporting a coin operated device and receiving the coins used to operate the device. The outer cylinder is fixed in position in the pipe and has an opening in its upper side wall substantially matching and aligned with the inner surface of the pipe to receive the coins discharged into the pipe from the coin operated device. The opposite wall portion of the outer cylinder has one or more small perforations therein of less size than the smallest diameter coin to be collected.

The inner cylinder has substantially 180° of rotation in the outer cylinder and is fixed against axial movement relative thereto. This inner cylinder has a side wall opening substantially matching that of the outer cylinder and, in the normally locked position of the inner cylinder, the two openings are substantially 180° apart so that no coins can pass into the inner cylinder.

Interlocking means are provided for preventing rotation of the inner cylinder to a coin-receiving position unless a special nozzle on a vacuum coin-gathering device is inserted into the inner cylinder with a vacuum maintained in the nozzle and inner cylinder. The interlocking means also prevents removal of the nozzle until the inner cylinder is rotated back to the security position, and prevents completion of such rotation unless the vacuum is maintained.

The interlocking means includes a spring pressed pin on the outer cylinder having locking engagement in the inner cylinder and released from such locking engagement by a radial lug or pin on the nozzle only when the latter is inserted into the inner cylinder a sufficient distance to engage a second radial lug or pin on the nozzle in a circumferential groove in the outer cylinder extending substantially 180° around the inner surface thereof. A spring-pressed plunger on the inner cylinder is normally engaged in an aperture in the outer cylinder and is retracted from its locking position only when a vacuum is maintained in the inner cylinder. Thus, the inner cylinder can be unlocked and rotated to its coin-receiving position only by insertion of the vacuum nozzle thereinto coincident with maintenance of a vacuum.

Under these conditions, it is still possible for a dishonest operator to shut off the vacuum after the inner cylinder is moved to the coin-receiving position, and to rotate the inner cylinder back to the security position and disengage the nozzle, thus leaving the coins in the inner cylinder. To prevent this, the outer cylinder is provided with a second aperture engageable by the locking plunger before the inner cylinder has been fully moved to the security position. Hence, if the vacuum is turned off, the inner cylinder is automatically locked in a position where the nozzle cannot be disengaged, and the vacuum must be re-established to withdraw the plunger from such second aperture before the inner cylinder can be rotated fully to the security position in which the nozzle can be disengaged. Consequently, all of the coins are sucked out of the inner cylinder and into the sealed receptacle of the gathering device before the nozzle can be disengaged.

For an understanding of the invention principles, reference is made to the following description of a typical embodiment thereof as illustrated in the accompanying drawing. In the drawing:

Fig. 1 is a side elevation view, partly in section, of a coin collecting system embodying the invention;

Fig. 2 is a front elevation view thereof, partly in section on the line 2—2 of Fig. 1;

Fig. 3 is a side elevation view of the outer cylinder;

Fig. 4 is an end elevation view thereof;

Fig. 5 is a side elevation view of the inner cylinder;

Fig. 6 is an end elevation view thereof;

Fig. 7 is a side elevation view of the two cylinders in the security position;

Fig. 8 is a side elevation view of the vacuum nozzle;

Fig. 9 is an end elevation view thereof; and

Fig. 10 is an axial sectional view of the two cylinders in the security position and with the nozzle fully inserted into the inner cylinder.

Referring to Figs. 1 and 2, the coin receiving and collecting arrangement of the invention is illustrated as incorporating in a mounting for a coin-operated device such as a parking meter 15. In accordance with the invention, meter 15 is mounted on the open upper end of an upright pipe or tube 11 arranged to have coins from meter 15 fall thereinto. The lower end of pipe 11 ex-

tends into the cross of a T 12 supported on a post 13.

The outer cylinder 20 of the invention system is suitably secured in the stem of T 12 and is arranged for interlocking engagement with a special nozzle 30 on the end of a flexible hose 14 connected to a vacuum blower, or the like, capable of creating a suitable vacuum with a relatively high velocity air flow. For example, a vacuum of 5 inches of water with a flow of 80 cubic feet of air per minute has been found suitable in practice. The coins sucked from the receiver by nozzle 30 flow through hose 14 into a sealed receptacle 60 to which a source of vacuum 61 is connected as at 62.

Referring to Figs. 3 and 4, showing outer cylinder 20, the inner end of cylinder 20 has a circumferential recess 21 in its inner surface forming a seat for an enlargement on the inner end of the inner cylinder. Outwardly of this recess, cylinder 20 has a pair of circumferentially aligned and spaced apertures 22 and 23 each having the free end of a spring 24 projecting thereover.

Intermediate its ends, the side wall of cylinder 20 has a circular aperture 25 in its upper surface, the diameter of aperture opening 25 substantially matching the inner diameter of pipe 11. The outer end of cylinder 20 is enlarged, as at 26, and formed with a circumferential groove 27 extending through substantially 180° of its inner surface. A short longitudinal groove 28 leads into groove 27. A headed pin 16 extends through an aperture in the wall of cylinder 20 inwardly of enlargement 26 and substantially diametrically opposite slot 28. A flat leaf spring 17 biases pin 16 to project from the inner surface of the cylinder.

The inner cylinder 40 is telescoped in outer cylinder 20 and oscillatable through substantially 180° therein. Referring to Figs. 5 and 6, cylinder 40 has an enlargement 41 on its inner end seating in recess 21 of cylinder 20. At a point aligned with apertures 22 and 23, cylinder 40 has a cylindrical bar 42 extending diametrically thereacross and aligned with an aperture 43 in the side wall of the cylinder. Bar 42 has a bore 44 therein seating a plunger 45 normally biased, to project through aperture 43, by a coil spring 46. Small apertures 47 in the wall of bore 44 establish communication between the bore and the interior of cylinder 40.

The outer end of cylinder 40 has a short slot 48 therein aligned with groove 28, in cylinder 20, when the cylinders are in the security position. Slot 48 extends inwardly to fully overlap circumferential groove 27. Diametrically opposite short slot 48, a longer slot 51 is formed in cylinder 40 and extends inwardly somewhat beyond pin 16. Intermediate its ends, the side wall of cylinder 40 has a circular opening 50 which, in either the security or coin receiving positions of cylinder 20, is coaxial with opening 25. Opening 50 is of the same diameter as opening 25.

When inner cylinder 40 is engaged in outer cylinder 20, as shown in Fig. 7, pin 16 engages in slot 51 and plunger 45 is biased into aperture 22 by spring 46. The position shown in Fig. 7 is the security position in which the coin receiver system is locked and no coins can enter inner cylinder 40. In this position, opening 50 in cylinder 40 is diametrically opposite opening 25 in cylinder 20, and faces downwardly. Hence, no coins discharged into pipe 11 can pass into cylinder 40. Cylinder 40 can be rotated to the coin receiving position, in which openings 25 and 50 are coincident, only by insertion of nozzle 30 into the receiver and establishment and maintenance of a vacuum in cylinder 40.

Referring to Figs. 8 and 9, nozzle 30 is a generally cylindrical member which is cut back on a diametric plane from its inner end to form a semi-cylindrical snout or nose 31. From the outer end of snout 31, nozzle 30 is cut on about a 45° angle to form a truncated cylinder 32. Just outwardly of the end of truncated portion 32, a trapezoidal pin or lug 33 projects outwardly from the nozzle. A second pin or lug 35 projects from nozzle 30 diametrically opposite pin 33 and axially spaced therefrom.

When nozzle 30 is inserted into inner cylinder 40, as shown in Fig. 10, pin 33 engages slot 51 and pin 35 engages slot 48, the pin 33 entering its slot 51 before pin 35 enters slot 48. When pin 35 has moved through slot 28 and fully into groove 27, pin 33 will have engaged and depressed pin 16 out of engagement with slot 51 thus releasing one of the latches preventing rotation of cylinder 40. However, plunger 45 remains engaged in aperture 22 so that cylinder 40 cannot be rotated.

In order to release plunger 45, it is necessary to establish a vacuum in cylinder 40 by means of the vacuum blower attached to hose 14. The maintenance of a flow of air from cylinder 40 into hose 14 is facilitated by the very small apertures 18 in outer cylinder 20 opposite opening 25 therein. With a vacuum maintained in cylinder 40, the air pressure outside cylinder 20, acting on the end of plunger 45 in aperture 22, pushes plunger 45 inwardly compressing spring 46. Air behind plunger 45 passes out through apertures 47.

With plunger 45 retracted, cylinder 40 can be rotated to align openings 25 and 50. Such rotation is effected by turning nozzle 30 so that pin 33, engaged in slot 51, and pin 35, engaged in slot 48, rotate cylinder 40. Pin 35 rides along groove 27, preventing disengagement of nozzle 30 and, when openings 25 and 50 are coincident, pin 35 engages the end of groove 27 preventing further rotation.

As openings 25 and 50 move toward full registry, the coins in opening 25, and formerly supported on the imperforated side wall of cylinder 40, fall through opening 50 into cylinder 40. If the vacuum blower is still operating to maintain the vacuum, the coins are carried into nozzle 30 by the high volume air flow and are gathered into the aforementioned sealed receptacle connected to hose 14.

If, at this time, the vacuum blower is not operating, the coins would still fall into cylinder 40 but would remain therein. This would allow the collector, after turning cylinder 40 back to the security position, to disengage nozzle 30 and appropriate the coins in cylinder 40. To prevent this unauthorized operation, means are provided to prevent full rotation of cylinder 40 back to the security position unless the vacuum is maintained in cylinder 40 until such movement is completed. It will be understood that nozzle 30 can be withdrawn only when the cylinder 40 is in the security position of Fig. 10.

The direction of rotation of cylinder 40 in moving to the coin receiving position is determined by the direction groove 27 extends from slot 28. This direction is such that plunger 45, when released from aperture 22, passes aperture 23 as cylinder 40 is moved to the coin receiving position. However, if the vacuum is maintained, plunger 45 does not enter aperture 23.

When cylinder 40 is rotated back toward the security position, plunger 45 is aligned with aperture 23 before cylinder 40 reaches the nozzle release position of Fig. 10. If the vacuum is maintained while cylinder 40 is rotated back toward the security position, so that coins flow into nozzle 30 and hose 14, plunger 45 remains retracted. However, should the vacuum blower be shut off, then, when plunger 45 is aligned with aperture 23, spring 46 will force the plunger into this aperture and lock cylinder 40 short of the nozzle release or security position. To release this lock, it is necessary to re-establish the vacuum, with attendant coin gathering through hose 14. Cylinder 40 may then be turned fully to the security and nozzle release position. Thus, provision of the second aperture 23 cooperable with plunger 45 prevents unauthorized coin removal by shutting off the vacuum.

While a specific embodiment of the invention has been shown and described in detail to illustrate the application of the invention principles, it will be understood that the invention may be embodied otherwise without departing from such principles.

What is claimed is:

1. A coin collecting system for coin-controlled ap-

paratus comprising, in combination, a generally upright pipe having a top opening to receive coins; an outer cylinder extending across the lower end of said pipe and having an opening in its side wall substantially congruent with the inner periphery of said pipe, said cylinder being disposed with said opening facing upwardly and in registry with said pipe; an inner cylinder coaxially telescoped in said outer cylinder and oscillatable therein, said inner cylinder having a side wall opening movable into coincident registry with the side wall opening of the outer cylinder; said inner cylinder having a normal security position in which its opening faces downwardly and the imperforate part of its side wall blocks the outer cylinder side wall opening; latch means locking said inner cylinder in such security position; a substantially cylindrical nozzle insertable into said inner cylinder and connected to a source of vacuum; coacting means on said cylinders and said nozzle operable, responsive to such insertion of said nozzle, to release said latch means; and interengaging means on said nozzle and inner cylinder effective, upon turning of said nozzle, to rotate said inner cylinder to a coin receiving position in which said side wall openings are aligned for passage of coins into said inner cylinder for flow into said nozzle due to air flow toward such source of vacuum.

2. A coin collecting system for coin-controlled apparatus comprising, in combination, a generally upright pipe having a top opening to receive coins; an outer cylinder extending across the lower end of said pipe and having an opening in its side wall substantially congruent with the inner periphery of said pipe, said cylinder being disposed with said opening facing upwardly and in registry with said pipe; an inner cylinder coaxially telescoped in said outer cylinder and oscillatable therein, said inner cylinder having a side wall opening movable into coincident registry with the side wall opening of the outer cylinder; said inner cylinder having a normal security position in which its opening faces downwardly and the imperforate part of its side wall blocks the outer cylinder side wall opening; latch means locking said inner cylinder in such security position; a substantially cylindrical nozzle insertable into said inner cylinder and connected to a source of vacuum; coacting means on said cylinders and said nozzle operable, responsive to such insertion of said nozzle, to release said latch means; interengaging means on said nozzle and inner cylinder effective, upon turning of said nozzle, to rotate said inner cylinder to a coin receiving position in which said side wall openings are aligned for passage of coins into said inner cylinder for flow into said nozzle due to air flow toward such source of vacuum; and means locking said nozzle in said inner cylinder except in such security position.

3. A system as claimed in claim 1 in which said latch means includes a spring biased pin on one cylinder normally engaged in the other cylinder and engageable by said nozzle, when the latter is inserted into the inner cylinder, for movement to the release position.

4. A system as claimed in claim 1 in which said latch means includes a spring biased plunger on the inner cylinder engaged in an aperture in the outer cylinder in the security position of the inner cylinder and moved to a retracted position responsive to establishment of a vacuum in the inner cylinder.

5. A system as claimed in claim 1 in which said latch means includes a spring biased pin on one cylinder normally engaged in the other cylinder and engageable by said nozzle, when the latter is inserted into the inner

cylinder, for movement to the release position; and a spring biased plunger on the inner cylinder engaged in an aperture in the outer cylinder in the security position of the inner cylinder and moved to a retracted position responsive to establishment of a vacuum in the inner cylinder.

6. A system as claimed in claim 2 in which said last-named locking means comprises a circumferential groove in the inner surface of said outer cylinder and extending through substantially 180°; a longitudinal groove in the inner surface of the outer cylinder extending from the outer end thereof to said circumferential groove; a slot in the inner cylinder extending from the outer end thereof to said circumferential groove; said slot and longitudinal groove being aligned only in the security position of the inner cylinder; and a radial pin on said nozzle engageable in said slot and said longitudinal groove for movement into said circumferential groove.

7. A system as claimed in claim 6 in which said latch means comprises a spring biased pin on the outer cylinder engageable in a second slot in the inner cylinder extending inwardly from the outer end thereof; and releasing means comprising a second radial pin on said nozzle engageable in said second slot and engaging and retracting said spring biased pin only when the first nozzle pin is aligned in said circumferential groove.

8. A system as claimed in claim 6 in which said latch means comprises a spring biased pin on the outer cylinder engageable in a second slot in the inner cylinder extending inwardly from the outer end thereof; releasing means comprising a second radial pin on said nozzle engageable in said second slot and engaging and retracting said spring biased pin only when the first nozzle pin is aligned in said circumferential groove; and said latch means further comprising a spring biased plunger on the inner cylinder engaged in an aperture in the outer cylinder in the security position of the inner cylinder and moved to a retracted position responsive to establishment of a vacuum in the inner cylinder.

9. A system as claimed in claim 6 in which said latch means comprises a spring biased pin on the outer cylinder engageable in a second slot in the inner cylinder extending inwardly from the outer end thereof; releasing means comprising a second radial pin on said nozzle engageable in said second slot and engaging and retracting said spring biased pin only when the first nozzle pin is aligned in said circumferential groove; said latch means further comprising a spring biased plunger on the inner cylinder engaged in a first aperture in the outer cylinder in the security position of the inner cylinder and moved to a retracted position responsive to establishment of a vacuum in the inner cylinder; and a second aperture in the outer cylinder circumferentially aligned with said first aperture and radially aligned with said plunger, upon movement of the inner cylinder toward the security position, before the inner cylinder reaches the security position; whereby, in the event a vacuum is not maintained in the inner cylinder until the latter has been returned to the security position, said plunger will engage said second aperture to prevent movement of said inner cylinder to the security position until a vacuum is re-established in said inner cylinder; thereby preventing withdrawal of said nozzle unless a vacuum is maintained in the inner cylinder while the latter is rotated fully to the security position.

No references cited.