United States Patent

[11] 3,587,921

[72] Inventors **Anthony Giangarra**
Hasbrouck Heights;
Kenneth J. Cybulsky, East Paterson, N.J.

[21] Appl. No. **719,532**
[22] Filed **Apr. 8, 1968**
[45] Patented **June 28, 1971**

[73] Assignee **Becton, Dickinson and Company**
East Rutherford, N.J.

[54] **MICROPIPETTE DISPENSER**
1 Claim, 6 Drawing Figs.

[52] **U.S. Cl.** **221/174,** 221/196, 221/197
[51] **Int. Cl.** **B23q 7/00**
[50] **Field of Search** ..... 221/174, 194—7, 237, 266, 277, 287; 222/325 (Inquired)

[56] **References Cited**
UNITED STATES PATENTS
2,294,979 9/1942 Goldberg 221/266X

Primary Examiner—Stanley H. Tollberg
Assistant Examiner—David A. Scherbel
Attorney—Kane, Dalsimer, Kane, Sullivan and Kurucz

ABSTRACT: A dispenser for micropipettes and the like including a storage area for containing a plurality of pipettes, means for transporting the pipettes one at a time from said storage area to a removal area, and a removal area adapted to receive and contain a single pipette in a position convenient for removal.

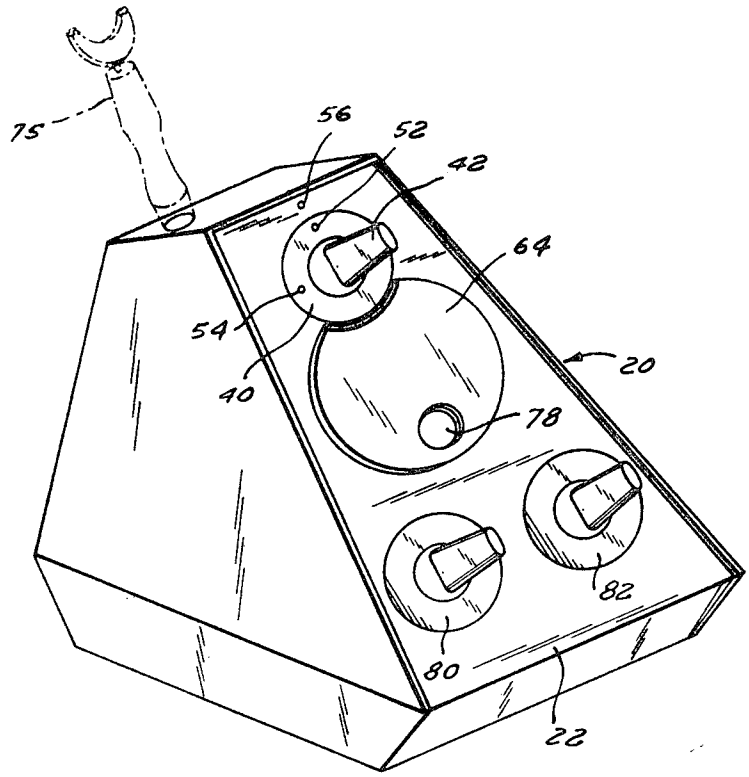
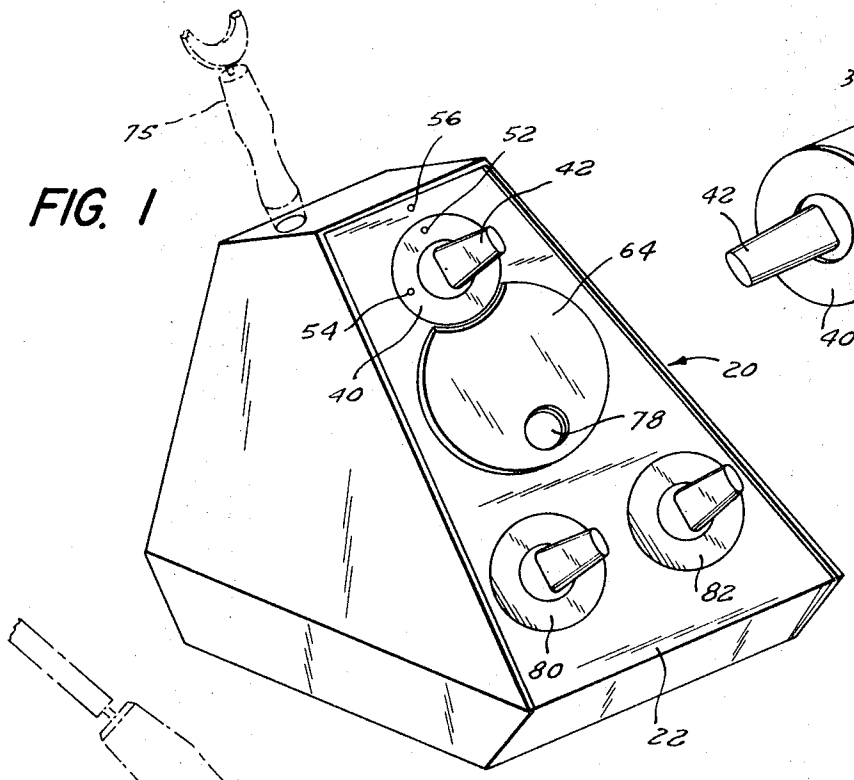


FIG. 1



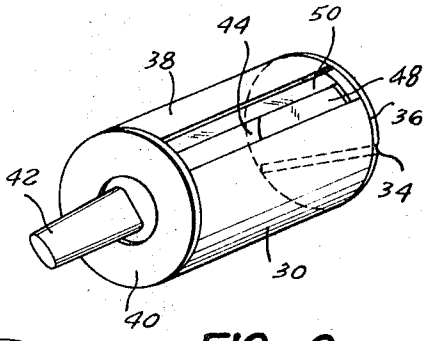
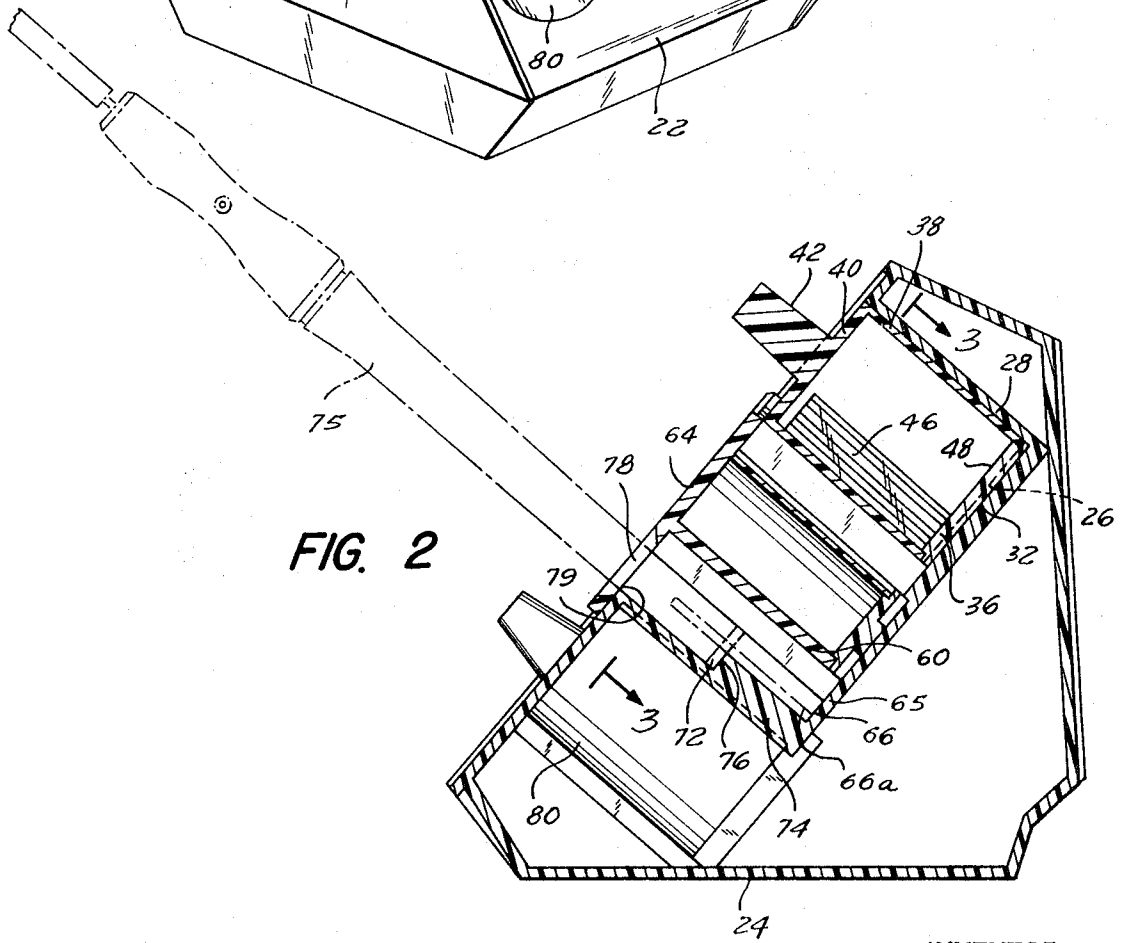


FIG. 6

FIG. 2



INVENTORS
ANTHONY GIANGARRA
KENNETH J. CYBULSKY

BY
Kane, Dalsimer, Kane, Sullivan & Smith
ATTORNEYS

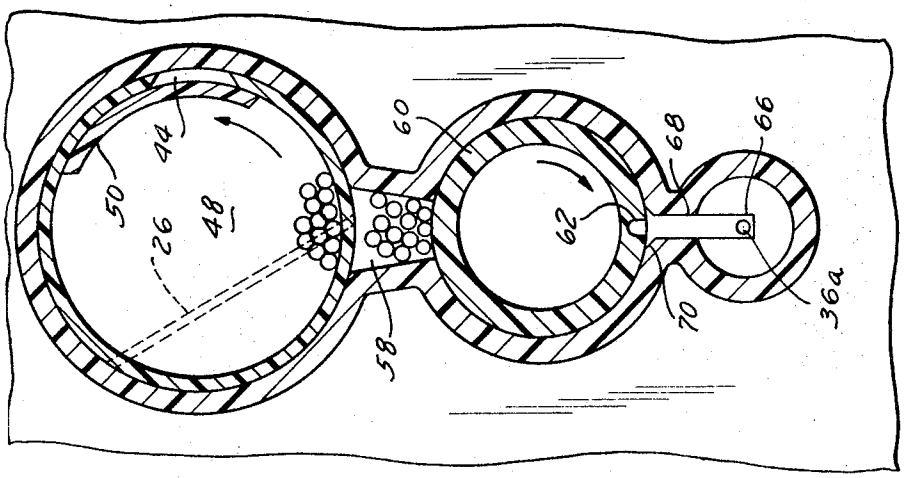


FIG. 5

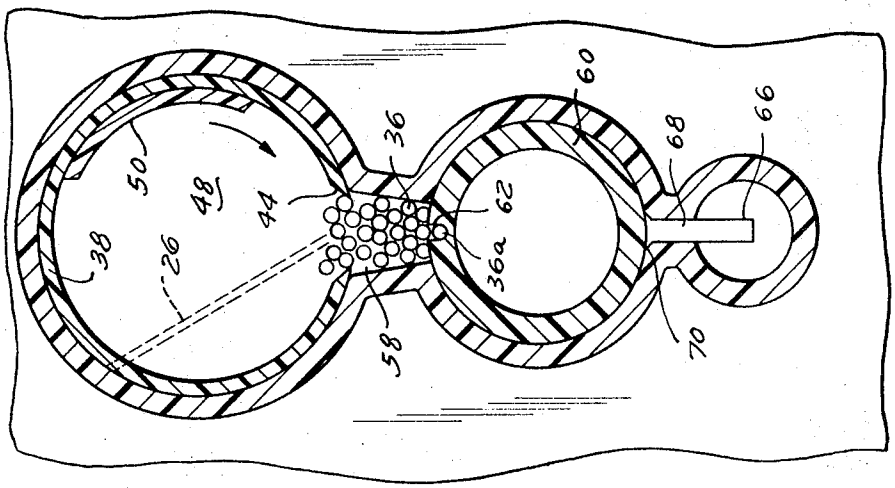


FIG. 4

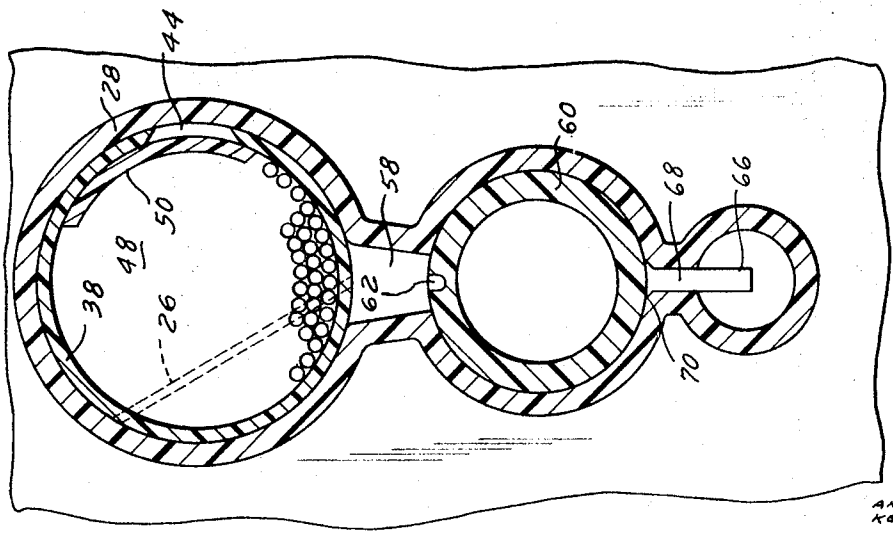


FIG. 3

INVENTORS
ANTHONY GIANGARRA
KENNETH J. CYBULSKY

BY
Kane, Dalsimer, Kane, Sullivan & Smith
ATTORNEYS

MICROPIPETTE DISPENSER

BACKGROUND OF THE DISCLOSURE

Laboratory and research installations utilize pipettes or capillary tubes in large numbers and for a wide variety of uses. These tubes are usually quite small and fragile and hence often are damaged during handling before they are ever utilized. Further, because of their small size and fragility they are difficult to handle and store. This is especially true since such products are most often made of glass and any breakage that does occur might result in dangerously sharp edges which would produce hazardous conditions within the laboratory. In addition, unless the pipettes are properly stored, there is a danger that the pipettes might become contaminated before they are used and therefore adversely affect the results of any procedure in which they are used.

In the commonly assigned application bearing Ser. No. 719,173 now U.S. Pat. No. 3,525,264 a pipette holder is disclosed which may be used to secure pipettes during use. The present invention relates to a container designed to dispense such pipettes one at a time to a holder of the type described in the above-referenced application or to any holder capable of gripping a single pipette or capillary tube.

Thus, it is the principal object of the present invention to provide a pipette dispenser designed to contain a plurality of pipettes in a environment where they will be relatively free from contamination and the possibility of breakage is minimized and to provide means for feeding such pipettes one at a time, as required, to a holder designed to secure the same during use.

SUMMARY OF THE INVENTION

These and other objects and advantages are most effectively attained in accordance with the present invention by providing a housing having portions adapted to store a plurality of pipettes, means communicating with the storage area for transporting pipettes one at a time from the storage area to a removal area, and a removal area which may include means thereon for cooperating with the gripping means of a pipette holder in securing the pipette to the holder. The storage area may be further adapted to receive a preloaded magazine or cartridge which has previously been filled with a plurality of pipettes so that the laboratory technician need never come in actual physical contact with the individual pipettes or capillary tubes.

DESCRIPTION OF THE DRAWINGS

In the accompanying drawings:

FIG. **1** is a perspective view of a pipette dispenser produced in accordance with the present invention;

FIG. **2** is a side elevational sectional view of the dispenser of FIG. **1** depicting a pipette holder in phantom in position to receive a pipette

FIG. **3** is a sectional view taken along the reference line **3–3** of FIG. **2**;

FIG. **4** is a view identical with FIG. **3** depicting the manner of loading the storage area of the dispenser from a magazine;

FIG. **5** is a view similar to FIGS. **3** and **4** depicting the manner of transporting a single pipette to the removal area; and,

FIG. **6** is a perspective view of a magazine used to load the dispenser of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Reference is now made to the drawings and in particular to FIG. **1** wherein a pipette dispenser in accordance with the present invention is depicted as including a housing **20** having a front panel **22** disposed at an acute angle with respect to base **24** and having surfaces defining openings into several compartments extending into the housing interior. A storage compartment formed within the housing and defined by rear wall **26** and cylindrical sidewall **28** is adapted to receive a

cylindrical magazine **30** of the type depicted in FIG. **6**. It should be noted that the storage compartment as well as the other compartments within the housing which will be described forthwith extend inwardly and downwardly into the housing interior so that gravity cooperates in retaining the housing contents within the several compartments. The rear wall of the storage compartment includes a raised key section **32** extending forwardly therefrom and adapted to engage the depressed keyway **34** extending across the rear surface **36** of magazine **30**.

Magazine **30** comprises a container having cylindrical sidewalls **38** to which a front panel **40** is rigidly affixed. A knob **42** extends outwardly from the front panel **40**. A slit **44** extends the length of container **30** defining an opening into the container interior. The arc defined by slit **44** is substantial in comparison to the diameter of the pipettes **46** contained therein so that if the container were positioned with slit **44** downward, the pipettes would freely fall out through the slit. Rear panel **48** is rotatably mounted to the rear end of the cylindrical sidewall **38** and elongated closure member **50** is affixed to panel **48** and extends into the container interior adjacent the inner surface of sidewalls **38**. Closure **50** comprises a cylindrical segment concentric with sidewall **38** and adapted, when properly positioned, to seal the opening **44** into the container interior. Thus, rotation of end panel **48** with respect to sidewall **38** will determine whether opening **44** is open or sealed by closure **50**. Keyway **34** extends across the rear of end panel **48** and is adapted to engage the key extending across the rear of the storage compartment so that when a sealed magazine is inserted within the housing so that key **32** of the housing engages the keyway of the magazine, the magazine may be opened merely by rotating knob **42**. Referencing indicia **52**, **54**, and **56** is provided on the magazine front panel and housing front to facilitate proper insertion and alignment of the magazine into the housing interior and to indicate to the technician at a glance whether or not the magazine has been opened. In this regard, it should be noted that for proper operation the magazine **30** should be disposed within the storage compartment with slit **44** located in such position that when the magazine is opened, the pipettes contained therein will fall into hopper **58** as shown in FIG. **4**. Thus, a sealed magazine **30** may be inserted into the storage compartment as depicted in FIG. **3** being sure that key **32** and keyway **34** engage. Knob **42** is then rotated while the key and keyway retain the closure in the same position so that magazine **30** shifts to the position depicted in FIG. **4**. In this position, slit **44** is directly above hopper **58** and since the closure has been removed, the pipettes **36** contained within the magazine will be gravity fed into the hopper **58**.

Hopper **58** comprises a downwardly tapering cavity the top of which communicates with the bottom of the magazine receiving compartment and the bottom of which communicates with the pipette transport means **60**.

Transport means **60** comprises a cylindrical member rotatably mounted within a cavity extending into the housing interior spaced vertically below and communicating with the bottom hopper **58**. The diameter of the transport member is substantially the same as the bore of the cavity designed to receive it thereby making it impossible for a pipette to slip from the hopper between the transport and its receiving cavity. A groove **62** extends across the transport from end to end. The depth and width of groove **62** are somewhat greater than the diameter of any single pipette contained within magazine **30** but not twice as great so that when the transport **60** is positioned as depicted in FIG. **4** with groove **62** disposed directly below hopper **58**, only a single pipette **36***a* will fall into groove **62**. Control knob **64** is affixed to the front end of transporter **60** and is positioned outside the housing. Thus, the dispenser operator, may by rotating knob **64**, rotate the transport means **60** so that a pipette **36** will be transported from the storage area to the removal area **66** as depicted in FIG. **5**.

The removal area **66** also comprises a cavity extending into the housing interior and it is located below the cavity adapted

to receive the transport **60**. The removal area cavity is connected to the transport cavity by vertical channel **68**, the upper end **70** of which is enlarged to guide pipette **36***a* from the transport so that when the transport is rotated, pipette **36***a* will drop from the transport through the channel onto shoulder **74**. Shoulder **74** extends forwardly from the rear wall **65** of removal area **66** for some distance less than the entire length of the cavity forming this area. The height of shoulder **74** is such that the center of a pipette resting on the shoulder will be disposed in the center of the removal area so that the gripping means or chuck **72** of a pipette holder **75** which is inserted into the area through opening **78** on the front wall of the housing will align with the pipette. The length of shoulder **74** determines and limits the degree of penetration of pipette **36** within the holder and in this regard, the front wall **76** of shoulder **74** serves as a stop to prevent over insertion.

As was previously mentioned the transport control knob **64** is rotatably mounted to the front of the housing and rigidly coupled to the transporter so that rotation of knob **64** results in rotation of transporter **60**. Knob **64** is a generally circular member the radius of which exceeds the distance by which the removal area is spaced below transport so that portions of the knob **64** will cover the surfaces of the housing defining the opening **78** into the removal area **66**. A suitable opening **79** is provided in knob **64** to permit the technician to insert a holder **75** into the removal area and thereby remove a pipette.

The interior of housing **20** is further divided into number of compartments suitable for the storage of surplus magazines **80** and **82** or to contain holder **75**.

It should be understood that modifications may be made in the illustrated and described embodiments of our invention without departing from the invention as set forth in the accompanying claims.

We claim:

1. A pipette dispenser comprising in combination: a housing; a first elongated cavity extending into said housing interior defining a storage area adapted to receive a magazine containing a plurality of pipettes; a second elongated cavity extending into said housing interior defining a removal area, said removal area being disposed below said storage area; a third elongated cylindrical cavity extending into the housing interior, said third cavity being disposed intermediate and tangent to said storage area and removal area cavities; transporting means comprising an elongated cylindrical member rotatably mounted within and substantially filling said third cavity; wherein said transporting means cylindrical member includes a groove extending longitudinally thereon, the depth and width of said groove being greater than the diameter of a single pipette to be associated therewith but less than twice said diameter whereby said cylindrical member may be rotated from a first position at which gravity will cause a single pipette to fall from said storage area into said groove to a second position at which gravity will cause said single pipette to fall from said groove into said removal area; and a magazine comprising a cylindrical tube having a longitudinal slit therein defining an opening into the magazine interior, a first end panel rigidly affixed to one end of said tube, a second end panel rotatably mounted to the opposite end of said tube, a closure panel rigidly affixed to said second end panel and adapted to rotate therewith from a first position at which said magazine is sealed to a second position at which the contents of the magazine are free to be removed through said slit.