Aug. 2, 1960 H. E. TAYLOR ET AL 2,947,444

DISC DISPENSER

Filed Jan. 18, 1956 3 Sheets-Sheet 1

Fig. 1

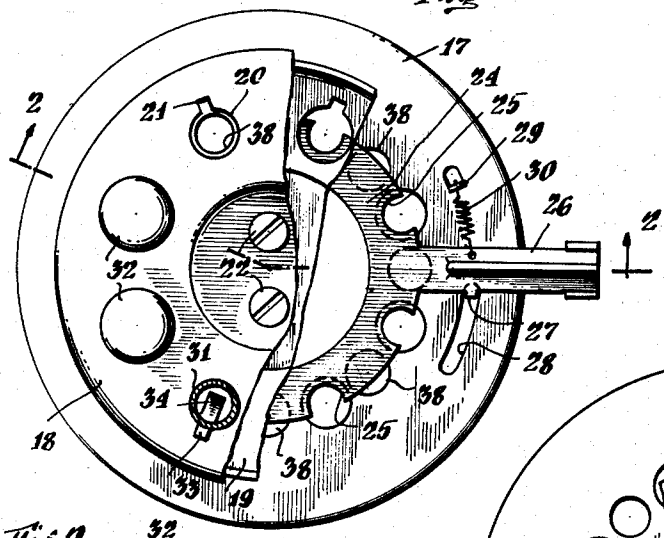


Fig. 3

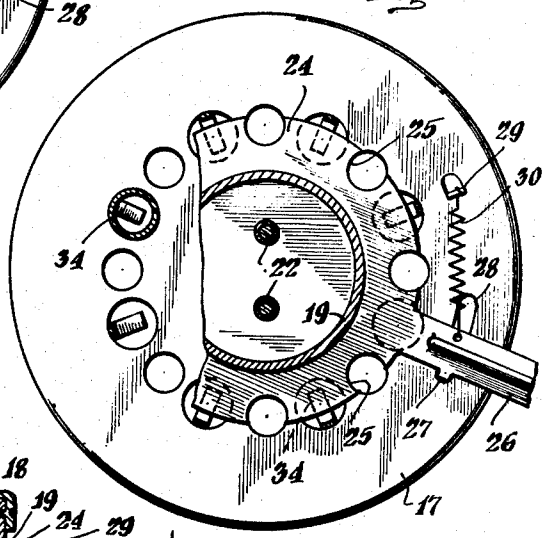


Fig. 2

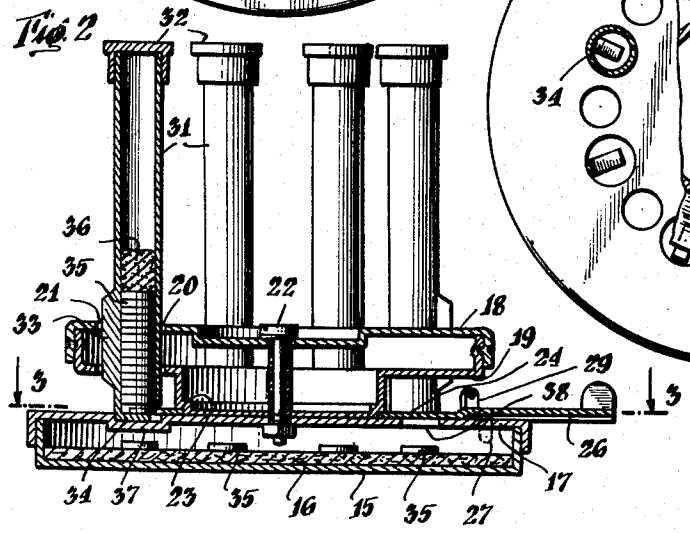
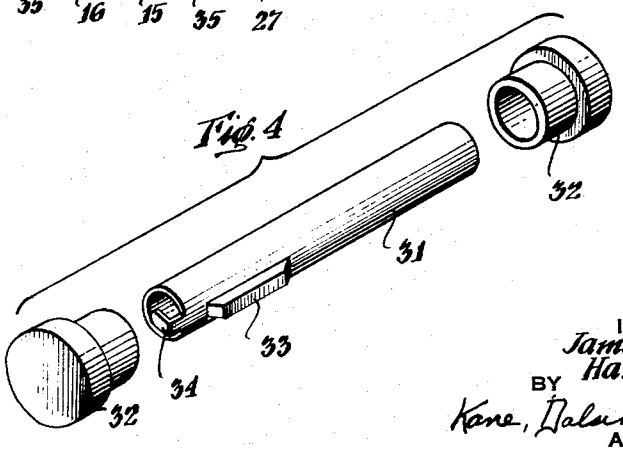


Fig. 4



INVENTORS
James R. Buck
Harry E. Taylor
BY
Kane, Dalsimer and Kane
ATTORNEYS

Aug. 2, 1960 H. E. TAYLOR ET AL 2,947,444

DISC DISPENSER

Filed Jan. 18, 1956 3 Sheets-Sheet 2

Fig. 5

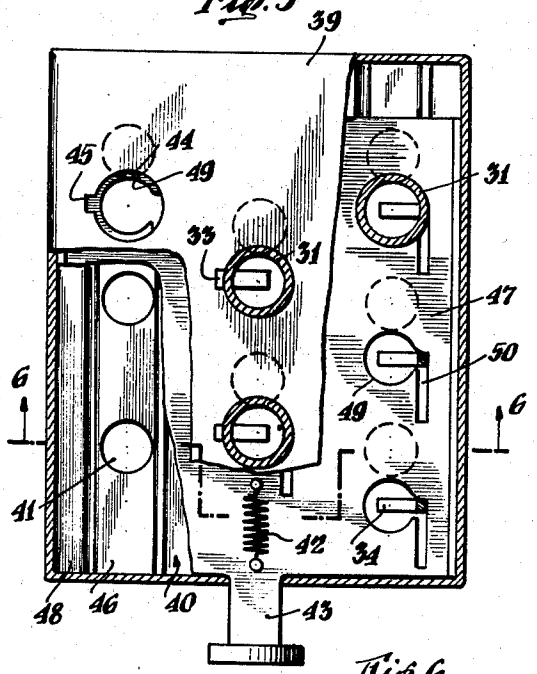


Fig. 7

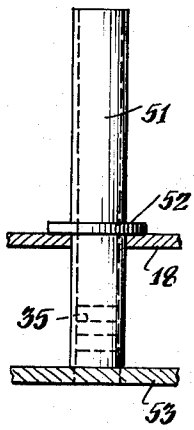


Fig. 9

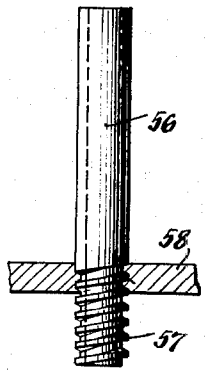


Fig. 8

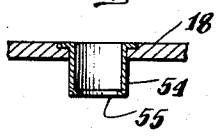


Fig. 6

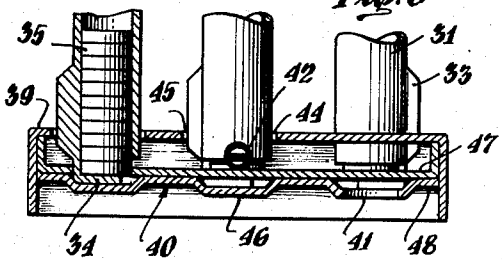


Fig. 11

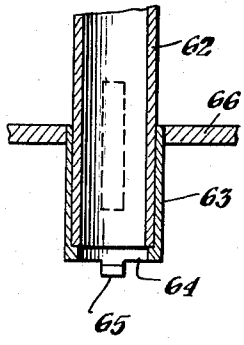


Fig. 12

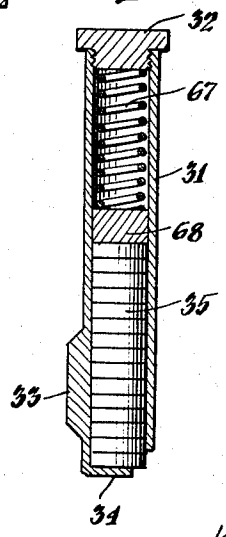
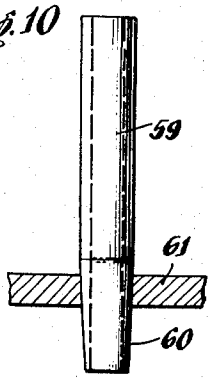


Fig. 10



INVENTORS
James R. Buck
BY Harry E. Taylor
Kane, Dalsimer and Kane
ATTORNEYS

Aug. 2, 1960 H. E. TAYLOR ET AL 2,947,444

DISC DISPENSER

Filed Jan. 18, 1956 3 Sheets-Sheet 3

Fig. 13

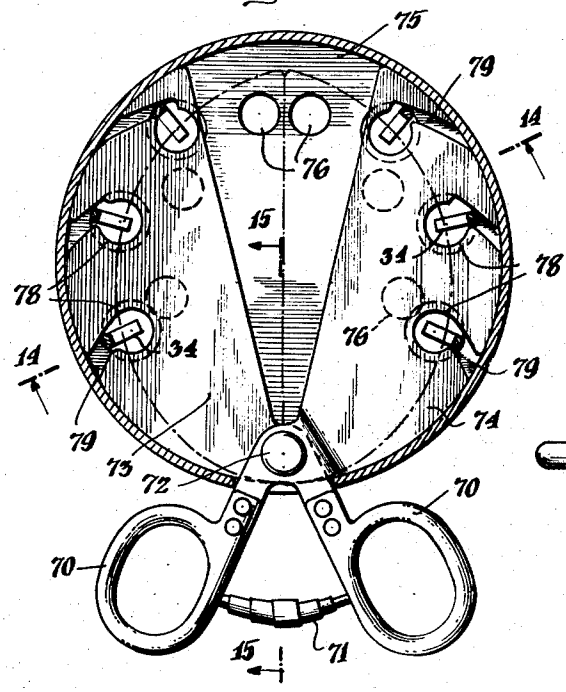


Fig. 15

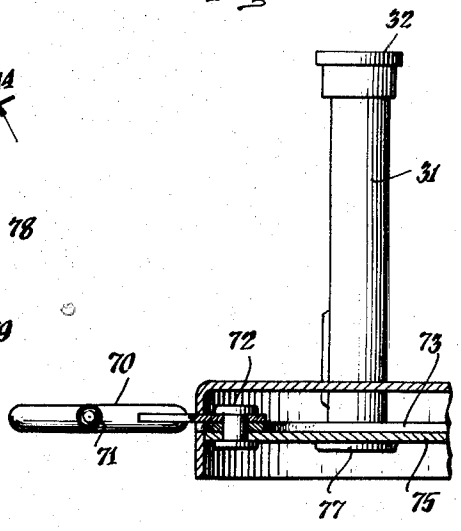


Fig. 14

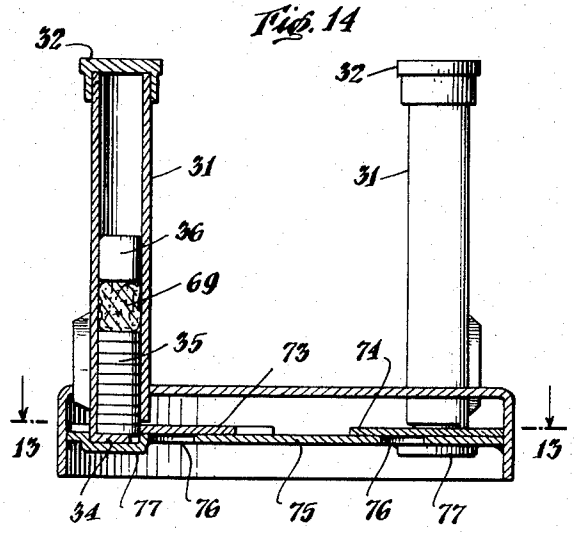


Fig. 16

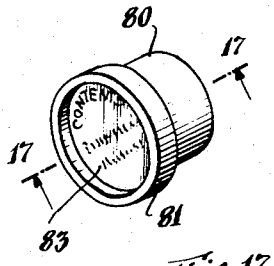
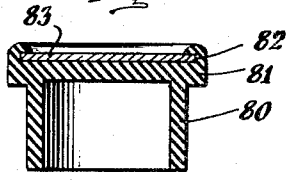


Fig. 17



INVENTORS
James R. Buck
BY Harry E. Taylor
Kane, Dalsimer and Kane
ATTORNEYS

United States Patent Office 2,947,444 Patented Aug. 2, 1960

2,947,444

DISC DISPENSER

Harry E. Taylor, Baltimore, Md., and James R. Buck, Jersey City, N.J., assignors to Becton, Dickinson and Company, Rutherford, N.J., a corporation of New Jersey

Filed Jan. 18, 1956, Ser. No. 559,929

7 Claims. (Cl. 221—93)

This invention relates to a structurally and functionally improved dispensing mechanism for sensitivity discs used in connection with the determination of microbial sensitivity to antibiotics, sulfanamides and other antimicrobial agents.

It is a primary object of the invention to furnish a mechanism of this type by means of which a user will be able to simultaneously dispense a number of discs into a receptacle such at a Petri dish and under a proper pattern involving suitable spacing of the dics with respect to each other.

A further object is that of furnishing a dispenser which will embody a desirable and simple design capable of ready and economical manufacture and which will function over long periods of time with freedom from all difficulties.

Still another object is that of providing magazine units for use with the dispenser and which units will maintain the discs in properly housed and aseptic condition aside from the fact that these magazines may readily be associated with the dispensing mechanism and replaced without difficulty when necessary.

With these and other objects in mind, reference is had to the attached sheets of drawings illustrating practical embodiments of the invention, and in which:

Fig. 1 is a plan view of a dispenser with certain of the parts broken away to disclose underlying structures;

Fig. 2 is a sectional side view of the apparatus taken along the line 2—2 in the direction of the arrows as indicated in Fig. 1;

Fig. 3 is a sectional plan view taken along the line 3—3 in the direction of the arrows as indicated in Fig. 2;

Fig. 4 is a perspective view showing the assembly of a magzine unit;

Fig. 5 is a plan view of an alternative form of apparatus with certain of the upper parts broken away;

Fig. 6 is a transverse sectional view taken along the line 6—6 in the direction of the arrows as indicated in Fig. 5;

Figs. 7, 8, 9, 10, 11 and 12 are each sectional side elevations of various different forms of cartridge units and fittings therefor which may be employed;

Fig. 13 is a sectional plan view of still another form of dispenser taken along the line 13—13 in the direction of the arrows as indicated in Fig. 14;

Fig. 14 is a transverse sectional view taken along the line 14—14 in the direction of the arrows as indicated in Fig. 13;

Fig. 15 is a fragmentary sectional side view taken along the line 15—15 in the direction of the arrows as also indicated in Fig. 13;

Fig. 16 is a perspective view of a closure or sealing element applied to one end of the cartridge or container units; and

Fig. 17 is a transverse sectional view taken along the line 17—17 in the direction of the arrows as indicated in Fig. 16.

As is well understood by the medical profession, it is

highly desirable to test the sensitivity of a patient to antibiotics, sulfanamides and other antimicrobial agents prior to the administration thereof. To this end, antimicrobial discs are employed and placed in a receptacle such as a Petri dish which contains a culture of, for example, the patient's blood in an agar culture medium. To position the discs within the receptacle, it has heretofore been necessary to employ a sterilized forcep, by means of which the discs are transferred one at a time to the dish and dropped on the surface of the culture.

Proceeding in this manner, difficulty is experienced in placing the discs uniformly and at properly spaced intervals. With a usual receptacle, only six discs could ordinarily be employed. By following the present teachings, eight discs or more may be properly disposed within a receptacle involving the same area. These discs will be simultaneously deposited so that it will be feasible to permit of proper observation of the zones of inhibition. This will assure greater certainty of results and permit testing with many antibiotics. Also, contamination of the discs with resultant inaccuracy of the tests will not occur when employing the present apparatus.

By having the discs impregnated with accurately determined amounts of antibiotics or other chemotherapeutic agents, it is possible, according to the reaction occurring, to provide to the physician information relative to the sensitivity or resistance of organisms to the various compounds.

Referring primarily to Figs. 1, 2 and 3, in which one form of apparatus has been illustrated, the numeral 15 indicates a suitable receptacle, such as a Petri dish, and within which a culture medium 16 is disposed. The base plate 17 of the present mechanism is preferably furnished with a downwardly extending peripheral flange which overlaps the side wall of the dish so as to maintain the relative position of these parts. An upper casing is furnished by plates 18 and 19 which may again be formed of sheet metal and stamped to furnish interlocked housing portions formed with an annular series of aligned openings 20. These openings have their edges recessed as at 21 and these recesses are preferably in register with each other. To maintain the housing assembly 18—19 against movement with respect to the base plate 17, bolts 22 may extend centrally in a downward direction through the upper housing 18 and through openings in the base plate 17. These bolts as shown are secured against displacement by means of nuts.

A guiding structure is provided adjacent the upper face of plate 17. With a view to simplifying the assembly, this guiding structure may simply embrace a flange portion 23 formed in the side wall of the lower housing part 19 at a point immediately short of that at which it engages plate 17. Thus, a groove or trackway is furnished. Within the latter, there is disposed the inner edge zone of an annular plate 24 which is thus rotatably supported but prevented from moving in lateral directions.

The diameter of disc 24 is such that its outer peripheral zone extends to a point adjacent the outer zones of openings 20. In this edge it is formed with a series of outwardly facing notches 25 or recesses which extend arcuately, preferably in excess of 180°, or as shown in the form of a circle. An extension 26 may be integral with plate 24 and project it beyond the side edge of plate 17. This projection is in the form of a handle, by means of which the plate may be oscillated. A tongue or tab 27 conveniently extends downwardly from this handle and rides within a slot 28 so that movements of the plate 24 with respect to base 17 are limited. This base may also be formed with an upstanding lug or tongue 29 adjacent handle 26 and to which one end of a tension type spring 30 is secured. The opposite end of that spring is attached to handle 26. Accordingly, the parts are

normally maintained in the position shown in Fig. 1, in which the notches 25 are each in line with openings 20, formed in the upper housing structure of the assembly.

Disc-containing ampules or cartridges form a part of the assembly. These may embrace bodies of metal, plastic, or any other suitable material. As shown in Fig. 4, the cartridge will include a main body portion 31 which is hollow and provides a bore of any desired configuration. The opposite ends of this body may have associated with them a layer of material (not shown) which, in accordance with conventional technique, will assure the user that the cartridge has not been opened or otherwise tampered with prior to his use thereof. A key 33 extends outwardly from the face of body 31 at a point preferably adjacent the lower end of the latter. At that lower end, an angularly shaped supporting extension or tongue 34 is preferably provided. This supporting portion extends in line with the bore of tube 31 and is spaced from the lower edge of the latter a distance slightly greater than the thickness of plate 24. Within each of the cartridges, a series of sensitivity discs 35 are disposed as in Fig. 2 and conveniently embrace outlines corresponding to the bore of the cartridges within which they are received. A suitable weight 36 may directly overlie the uppermost of this series to thus urge the entire column of discs downwardly, so that the lowermost disc tends to occupy a position where it is supported by the extension 34.

The discs within each of the cartridges will be specific to different antibiotics. A series of these cartridges, such as eight, will be disposed one within each of the openings 20. As a consequence of the notches 21, such disposition will occur in a predetermined manner, in that keys or extensions 33 must necessarily be received one within each of the notches. So disposed, the supporting extensions 34 of all of the cartridges will project inwardly towards the center of the assembly. Having in mind the diameter of disc 24, the periphery of the latter will, under those circumstances, clear these extensions. In line with each pair of openings 20 in the upper housing portion of the mechanism, base plate 17 may be formed with a depressed portion 37. This will receive the extension 34 of a tube 31 and thus limit projection of the latter. Also, so supported, the part of this extension 34 which underlies the bore of the tube 31 will be disposed below the plane of plate 24.

Now considering the operation of the device as aforedescribed, it will be assumed that a dish 15 has been provided and which contains a suitable body 16 of culture medium and a sample of a patient's blood. It will also be assumed that each of the openings 20 has received one of the cartridge bodies 31 after the lower seal 32 has been removed from the latter. As afore brought out, so received, the keys or extensions 33 of the several cartridges will be disposed one within each of the notches 21 and therefore, the supporting portions 34 will not alone be disposed within the depressed parts 37 of plate 17, but will also face inwardly so that the edge zone of plate 24 may ride within the space defined by tongue 34 and the adjacent lower edge of cartridge body 31. Under these circumstances, spring 30 will—according to the illustrated embodiment—maintain plate 24 in a position at which its notches 25 align with the openings 20 of the upper housing portions as well as the depressions 37. Intervening the latter, base portion 17 is formed with a series of openings 38, one between each of the depressions. These latter openings embrace diameters, preferably just in excess of the diameter of the sensitivity discs 35.

Now, with base 17 disposed upon dish 15 and retained against rotation, an operator will simply move the projection or handle 26 in a clockwise direction as viewed in Fig. 1. In such movement, spring 30 will be increasingly tensioned. Also, it will be observed that the lowermost disc 35 of the series associated with each cartridge will be engaged by the side edge of a notch 25 as the plate 24 is thus moved. Accordingly, these lower discs will be laterally displaced and carried with plate 24. As a disc moves out of the zone of the cartridge which initially held it, the entire series of discs within a body 31 will shift downwardly. The movement of the dispensing plate 24 will continue until each of the notches 25 is in line with one of the openings 38. At those points, the laterally shifted discs will drop through the latter openings onto the surface of the culture medium within the Petri dish 15. So dropping, they will be properly spaced in non-interfering relationship with respect to each other. The operator may now release handle 26 which, under the influence of spring 30, will cause plate 24 to return to its initial position shown in Fig. 1. Thereupon, the entire cycle of operation may be subsequently repeated. By means of the limiting or stop structure provided by tab 27 and slot 28, the oscillation of the plate is, of course, confined to a range which at one limit assures operative alignment of notches 25 with the bores of the cartridges, and at the other limit alignment of these notches with openings 38.

Now referring to Figs. 5 and 6, it will be seen that the same functional results achieved by the apparatus of Figs. 1 to 3 may be accomplished without resorting to a structure involving an annular series of cartridges and a rotatable dispensing plate. Rather, as in these latter figures, a housing portion may be furnished by an upper section 39 and a lower casing portion 40 suitably connected to each other to provide a hollow enclosure. Plate 40 is formed with a series of openings 41, each having an area such that a disc 35 may be dispensed therethrough. A plate 47 of an area less than the housing in a lengthwise direction is reciprocable within that enclosure. A spring 42 normally maintains plate 47 in a retracted position. A plunger 43 extending rearwardly of the housing is connected to plate 47 and may project the same against the compression of spring 42. The upper plate 39 of the housing is formed with openings 44 of areas such that they may receive the lower ends of cartridges 31. These openings also include in their edges notches 45 which receive the ribs or keys 33 of a cartridge in order that the latter may be disposed in a predetermined position with respect to the housing and its associated parts. Plate 40 has trough-shaped parts 46 which receive the extensions 34 of the cartridges and limit the projection of the latter into the housing. Adjacent these depressions, disc plate 40 may include projecting portions 48 which supportingly engage the lower face of the dispensing plate 47. Therefore, the latter is maintained in a plane which intersects the space intervening the lower edge of a cartridge and the supporting extension 34 thereof. That plate is also formed with openings 49 with which slots 50 are contiguous. These slots accommodate those parts of extensions 34 which project in line with the axis of the cartridge. The series of openings might of course be arranged to conform to an annular dish if a square pattern were not desired.

As will be apparent, one each of the cartridges 31 is mounted within an opening 44 and with the key 33 extending into the notch 45 of the same. It will be assumed that plate 40 is resting upon or above a culture and blood receiving receptacle. The projection of the cartridges is limited to points at which the extensions 34 are in bearing contact with the depressed portions 46. Dispensing plate 47 has its openings 49 in line with openings 44 as a consequence of the spring 42 urging that plate to the desired position.

Now as the dispensing plate is projected by means of the knob or post 43, it will be apparent that the edges of openings 49 will each act to laterally displace the lowermost disc 35 of a cartridge 31 and move the latter until all of these discs are in line with openings 41 formed in the bottom plate 40. So aligned, they will drop through these openings into the receiving dish.

With a proper pattern of openings 41 provided, the spacing of the discs within the dish will be entirely proper. Thereupon, the assembly may simply be removed from the dish and the zones of inhibition observed.

It is of course apparent that cartridges of diverse character might be employed in lieu of that specifically illustrated in Fig. 4 and which would achieve certain or all the results attributable to that unit in the manner aforestated. Thus, as in Fig. 7, the tubular body 51 providing the carriage might be formed with a flange portion 52. The latter would bear against the upper surface of a supporting plate such as 18 and thereby limit the movement of the cartridge. So limited, it would not project beyond the plane of the upper face of a plate 53 corresponding to plates such as 24 and 47. As shown, the supporting element 34 could, under those circumstances, be eliminated and the lower open end of the cartridge or cylinder could bear against the upper surface of the plate 53 which would constitute the disc-displacing element. To this end, it would be provided with openings alternately alignable with the lower cartridge ends, or holes in a base plate.

If instead of employing a flange individual to each cartridge or body 51, it were desired to have their bodies of simply tubular configuration, then for example the plate 18, as in Fig. 8, might carry a thimble or eyelet 54 having an inwardly extending flange portion 55. The latter would define an opening such that the discs could pass therethrough. However, it would provide a supporting ledge to limit projection of the cartridge. Likewise in Fig. 9, the flange is eliminated. In that case, the tubular body 56 terminates in a reduced, relatively coarse thread 57. That thread engages with similar threads formed in the plate 58 which corresponds to plate 18 or plate 39. By having a single entrance portion to the thread of plate 58, a predetermined positioning of the cartridge would follow. The lower free end of that cartridge could, of course, bear against the dispensing plate in a manner similar to the structure illustrated in Fig. 7 if a supporting element such as 34 were not employed.

A still further form of structure useful in this connection is shown in Fig. 10. In that view, the cartridge 59 has its lower end portion tapered as at 60 in a precise manner. The plate 61 is formed with a correspondingly tapered opening; that plate being similar to, for example, plate 18. When the two surfaces mate, then the cartridge 59 would be prevented from further inward movement and its lower end would occupy a plane in precise operative relationship to the other mechanisms of the assembly. In Fig. 11, there has been shown the provision of a plain tubular cartridge 62 which may be disposed in any desired manner into a holder or socket 63 having a flanged lower end 64 and a retaining extension 65. This socket being mounted by the plate 66, again corresponding to plates such as 18 and 39, it follows that the retaining and supporting element 65 will at all times be properly positioned with respect to the dispensing plate. Also, inward movement of the cartridge 62 will be limited by the lower edge of the latter abutting flange 64. As shown in Fig. 12 and in lieu of a weight such as 36, the cartridge 31 might, in addition to the discs 35, receive a spring 67 bearing at its upper end against seal 32 and at its lower end against a partition member 68. The latter would overlie the stack or series of discs 35, which would thus be urged downwardly into engagement with the supporting and retaining element 34.

In many respects, it is preferred that the cartridge unit involve a disc-supporting structure of the type shown at 34. Of course, where the end of the cartridge simply bears against the dispensing disc or plate, a proper feeding of the discs will also obtain. Regardless, however, of the particular cartridge employed, and both with respect to mechanisms of the type shown in Figs.

1 to 3 as well as that illustrated in Figs. 5 and 6, it is apparent that a proper supporting structure is furnished. In the first three figures, that structure will involve in its essentials a plate such as 18 and a lower plate such as 17, each formed with a series of openings which are non-aligned in the two plates. Plate 18 or plate 39 will furnish a proper support for the cartridges assuring that they are disposed in positions, with reference to the mechanism, such that the discs will be efficiently dispensed. Insofar as the dispensing structure is concerned, it involves in its essentials a plate such as 24 or 47. This is movably mounted at a point intermediate the first two plates and is also formed with a series of openings which—by a shifting of the dispensing plate—may be alinged with either the openings of the upper plate or the lower base plate.

As will be understood, in connection with all of the several structures afore described, the spacing of the parts is such that only a single disc is removed. In other words, the slot or its equivalent has a thickness not greater (insofar as the plates 24 or 47 are concerned) than that necessary to accommodate less than two discs. Therefore, one is assured in operating the mechanism that only a single layer of discs will be dispensed. While on the subject of discs, it is to be understood this is to be construed in a generic rather than a limiting sense especially with reference to the appended claims. Tablets, not alone conforming in outline to the dispensing openings, are preferably employed, and also those tablets could be square, triangular or of any other desired configuration. In that event, it is preferred that the bores of the magazines have similar outlines.

A shear-like arrangement could be resorted to in providing an apparatus incorporating the desired functions as shown in Figs. 13, 14 and 15. In those views, the numerals 31 again indicate cartridges or magazines closed at their upper ends by, for example, seals 32 and having at their lower ends openings into the axes of which extensions 34 project. Similar to the afore described structures, weights 36 may act against a series of the discs or tablets 35. As illustrated especially in Fig. 14, a mass of cotton or similar material 69 might be interposed between the weights 36 and the tablets 35. This would serve to prevent the discs from "cocking" in the case of a partially filled cartridge and if the latter were inclined to have its normally upper portion extend downwardly. In other words, the body 69 will act as a detent in frictional contact with the bore of the cartridge to prevent the stack of discs from readily shifting therein. Accordingly, when he weight 36 once assumes its proper position incident to correctly disposing the apparatus in a substantially vertical plane, the discs 35 will in each instance be urged downwardly towards the dispensing station.

Returning to a consideration of the apparatus in these latter figures, a pair of finger or hand-gripping portions 70 are furnished, between which there may be interposed a spring 71 to normally urge them in opposite and outward directions. These handles are pivotally connected to each other as at 72 and beyond that point are integral with or connected to plates 73 and 74. The latter are shiftable towards and away from each other and ride adjacent the upper face of a plate 75 provided with dispensing openings 76 arranged, for example, in a generally annular pattern. This plate 75 may also be provided with well or receiving portions 77 to retain the lower ends of the cartridges and so that the plates 73 may be shifted into the dispensing slots or gaps adjacent the lower ends of those elements.

Each of those plates, as especially shown in Fig. 13, is provided with openings 78 of configurations proper to receive one of the discs; the thickness of plate 73 being such that only one tablet will be displaced with respect to the magazine or cartridge as the plate is oscillated. These openings 78 may be continued in the form of

tangentially extending slots **79**. The latter serve to provide gaps within which that portion of the extension **34** which projects axially of the cartridge may ride. As is apparent in this form of apparatus when pressures exerted manually are relieved, spring **71** will separate plate **73** to a maximum extent. Under those circumstances, the openings **78** will align one with each of the lower ends of the cartridges **31**. While maintaining the apparatus in proper vertical position, if handle portions **70** are shifted towards each other, then the tablets or discs disposed within the openings **78** will be moved laterally into line with openings **76** and thus discharged to positions below plate **75**.

As in Figs. 16 and 17, a closure or seal element, generally corresponding to the one heretofore described and indicated at **32**, may be employed. However, this seal element in addition to including a body or plug portion **80** and a head **81**, will have its outer face recessed by providing a groove **82** in the head. Within this groove, an indicia-carrying label **83** may be disposed. Of course, in lieu of this label, an actual disc of the nature indicated at **35** might be thus inserted. In any event, such indication would serve to adequately identify and describe the contents or tablets within a given cartridge.

Thus among others, the several objects of the invention as specifically aforenoted are achieved. Obviously numerous changes in construction and rearrangements of the parts might be resorted to without departing from the spirit of the invention as defined by the claims.

We claim:

1. A disc-dispensing apparatus comprising in combination a supporting structure embracing a pair of vertically spaced plates, each formed with a series of openings, the individual openings in one plate being non-aligned with openings in the other plate, a dispensing structure including a plate also formed with a series of openings substantially aligned with the openings of said one plate of said pair, means for supporting the plate of said dispensing structure at a point intermediate the plates of said pair, cartridge-supporting sectors forming parts of said other plate of said pair of plates, disc-containing cartridges extending through the openings in said one plate of said pair into supporting relationship with said cartridge-supporting sectors of said other plate of said pair, and at least one of said disc-containing cartridges comprises a tubular body having an open end, the bore of said body containing discs to be discharged through the open end of such body, surfaces of said body being cooperable with surfaces of said supporting structure when said cartridge is disposed in a predetermined position with respect thereto, and further means forming a part of said cartridge to cooperate with other surfaces of said supporting structure for assuring the establishment of such position.

2. A disc-dispensing apparatus comprising in combination a supporting structure embracing a pair of vertically spaced plates, each formed with a series of openings, the individual openings in one plate being non-aligned with openings in the other plate, a dispensing structure including a plate also formed with a series of openings substantially aligned with the openings of said one plate of said pair, means for supporting the plate of said dispensing structure at a point intermediate the plates of said pair, cartridge-supporting sectors forming parts of said other plate of said pair of plates, disc-containing cartridges extending through the openings in said one plate of said pair into supporting relationship with said cartridge-supporting sectors of said other plate of said pair, each of said cartridges having extending therefrom a projection, and one of the plates of said pair being provided with recesses for the reception of the projections of said cartridges.

3. A disc-containing apparatus comprising in combination a supporting structure embracing a pair of vertically spaced plates, each formed with a series of openings, the individual openings in one plate being non-aligned with openings in the other plate, a dispensing structure including a plate also formed with a series of openings substantially aligned with the openings of said one plate of said pair, means for supporting the plate of said dispensing structure at a point intermediate the plates of said pair, means connected to one of said structures for shifting the plate of said dispensing structure with respect to said pair of plates to substantially align the openings of the plate of said dispensing structure with the openings of said other plate of said pair, a series of disc-containing cartridges removably receiving within the openings of said one plate of said pair with portions of each of said cartridges resting upon the other plate of said pair and means forming a part of said cartridges and supporting structure cooperating to maintain the position of the former in a predetermined relationship with respect to the latter.

4. The invention in accordance with claim 3 wherein said maintaining means comprises a key and keyway structure formed in said cartridge and supporting structure and cooperates to establish the desired predetermined relationship of the parts.

5. The invention in accordance with claim 3 wherein a disc-supporting element is associated with said cartridge and said dispensing plate and moves adjacent said supporting element.

6. The invention in accordance with claim 4 wherein said establishing means comprises a rib associated with one of each of said cartridges and said supporting structure provides a recess for the reception of such rib.

7. A disc-dispensing apparatus comprising in combination a supporting structure embracing a pair of vertically spaced plates, each formed with a series of openings, the individual openings in one plate being non-aligned with openings in the other plate, a dispensing structure including a plate also formed with a series of openings substantially aligned with openings of said one plate of said pair, means for supporting the plate of said dispensing structure at a point intermediate the plates of said pair, means connected to one of said structures and extending beyond all of said plates for shifting the plate of said dispensing structure with respect to said pair of plates to substantially align the openings of the plate of said dispensing structure with the openings of said other plate of said pair, said other plate being recessed adjacent each one of its openings for cooperating to support disc-containing cartridges received within the openings of said one plate of said pair, and said one plate of said pair being recessed adjacent each one of its openings for cooperating to maintain the position of the disc-containing cartridges in a predetermined position with respect to said supporting structure.

References Cited in the file of this patent

UNITED STATES PATENTS

1,460,878	Allen	July 3, 1923
1,663,510	Wessman	Mar. 20, 1928
1,671,285	Hanna	May 29, 1928
2,100,860	Lobley	Nov. 30, 1937
2,285,272	Hagstrom	June 2, 1942
2,489,765	Emerson et al.	Nov. 29, 1949
2,604,245	Shaw	July 22, 1952
2,608,002	Bielstein	Aug. 26, 1952
2,621,655	Olson	Dec. 16, 1952
2,628,874	Everhart	Feb. 17, 1953
2,698,682	Bodan	Jan. 4, 1955

FOREIGN PATENTS

3,387	Great Britain	of 1913
700,612	Great Britain	Dec. 9, 1953