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3,245,545

ROTARY FILING APPARATUS

Filed Sept. 18, 1964

2 Sheets-Sheet 1

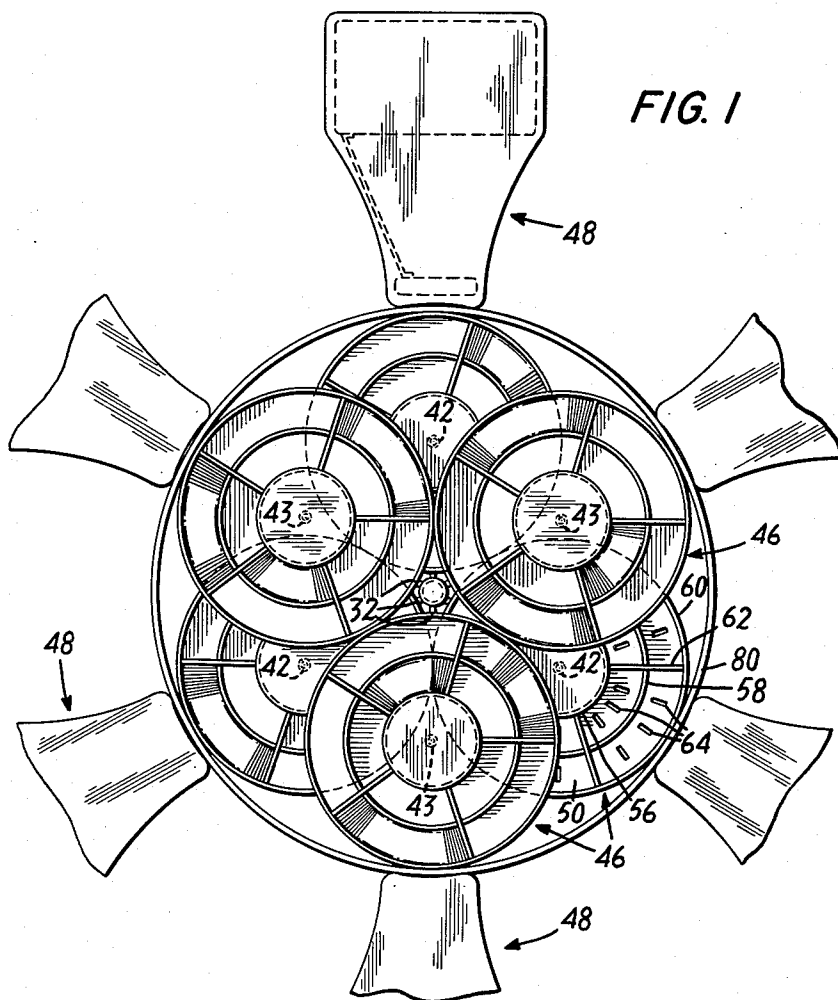
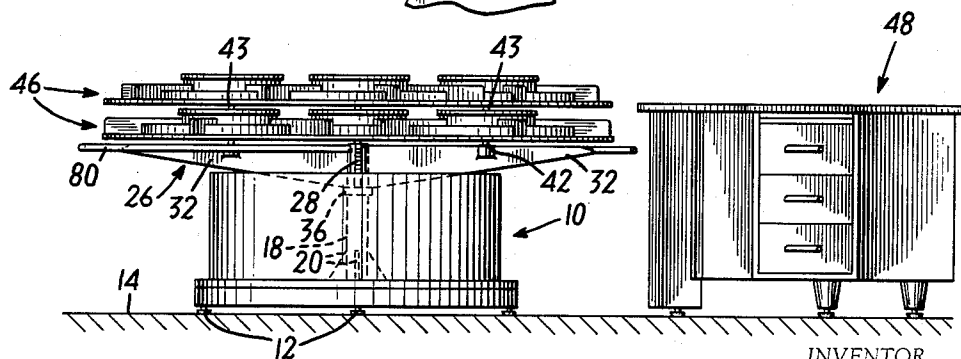


FIG. 2

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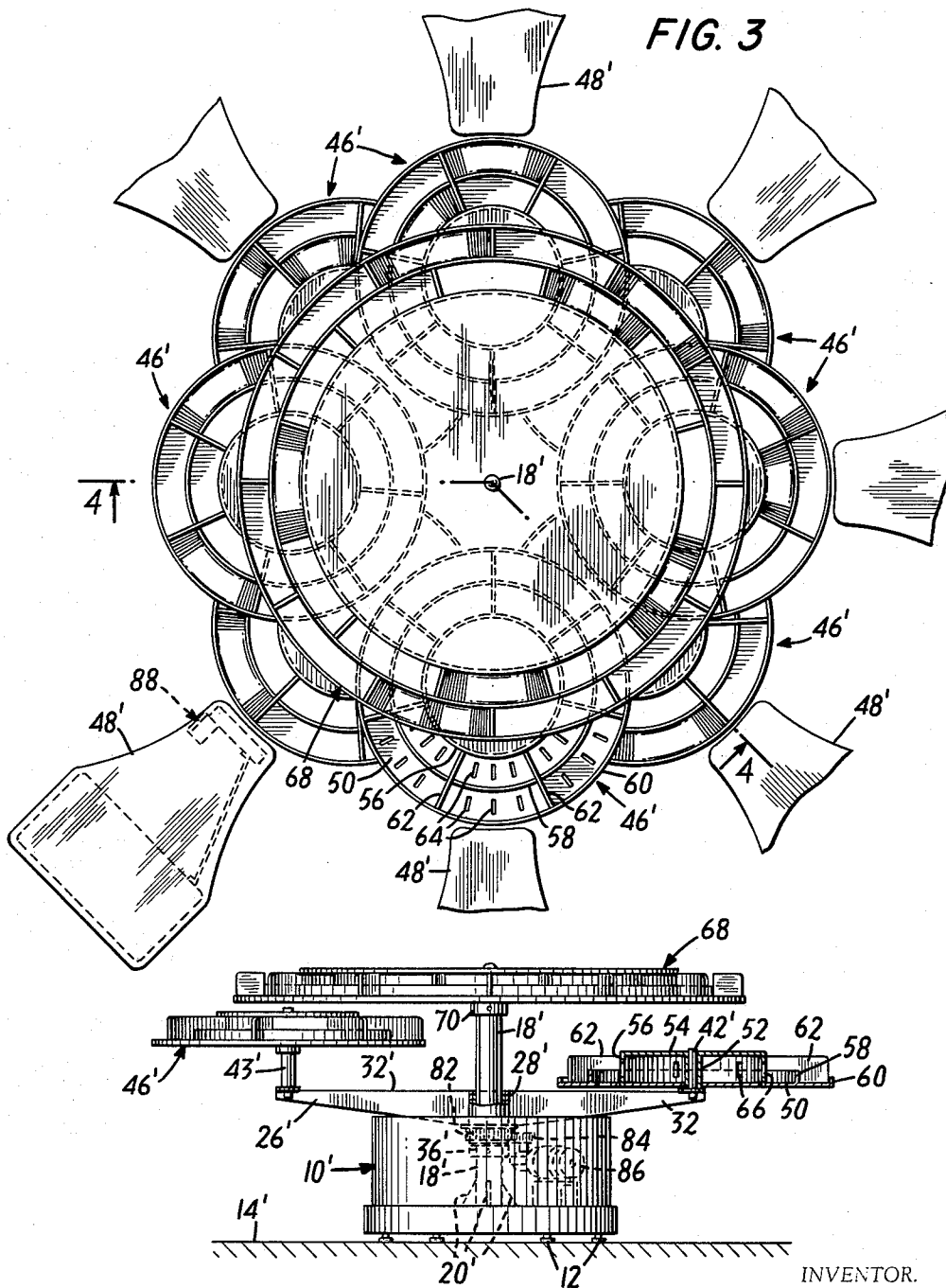
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3,245,545

## ROTARY FILING APPARATUS

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This invention relates to filing systems, and more particularly, to a novel and improved rotary file apparatus of the type accommodating a very large number of cards in such a way that they are readily available for reference and are easily and quickly removed and replaced by operators at any one of a number of operating stations.

Filing systems in which information is carried on small cards such as 3 x 5, 4 x 6 or 5 x 8 inches, for example, are in common use. Such systems may consist of trays or drawers in a cabinet. For very large numbers of cards, however, filing equipment has been devised in which the cards are arranged in one or more concentric annular rows or in rows aligned generally radially on a rotatable circular file. A card may be referred to or located and removed by rotating the circular file until an indexed location is brought abreast of an operator stationed at a desk at the perimeter of the file.

When a circular file of the above-described type includes several concentric annular card-receiving rows, considerable difficulty is encountered by the operator both in locating and, more importantly, in removing and replacing the cards. More particularly, the farther inwardly toward the center of the axis of rotation of the circular file the cards are located, the more difficult it is to seek out the desired card because it is located farther away from the operator who must therefore reach out for it and because it must be viewed at a more oblique angle than the cards nearer the perimeter of the file. Operators of large filing systems of the above-described type quickly become fatigued from stretching and twisting to view and locate and then remove and replace cards and, moreover, are subject to chronic stiffness and pains which recur after only short periods of operating the file system. Accordingly, rotary file systems generally include only one or two concentric annular card receiving areas adjacent the circumference of the file in order to reduce the difficulty of reaching and viewing the cards, but when the number of annular rows of cards, is reduced, the capacity of a given overall floor area occupied by a unit is similarly reduced.

One use of card filing systems is the warranty card system used by manufacturers or distributors of appliances and the like, the warranty information cards carrying information for the use of a central service organization. A very efficient method of handling large numbers of service requests consists of large card file systems having several operator stations. Incoming service request calls are routed to an operator at one of the stations who then ascertains the identity of the owner and the type of device to be serviced. She then locates the warranty card for the particular device, removes it, and makes suitable arrangements for a repairman to make a service call, such as by preparing an order form.

For such an operation to be carried out efficiently, as many cards as possible should be contained in the file in order not to delay assisting the owner of the device to be serviced while the warranty card is being located. With the greatly increasing numbers and types of appliances in use and the corresponding increase in service calls in recent years, the warranty card system is becoming more and more of a problem. An important requirement for efficient operation of the system is that the information be centralized as much as possible, thus requiring file systems of large capacity, and that the operators be able

to locate and remove a card as quickly as possible, in order to release the filing systems so that other operators may locate and remove cards on other incoming service requests.

One way of increasing the capacity of a circular card file of the above-described type without significantly increasing the difficulty of searching and removing the cards is to increase the diameter, thus increasing the linear space accommodating the cards. The disadvantages of this solution, however, are that floor space is less efficiently used as the size of the circular file increases, the card capacity increasing in direct proportion to an increase in file diameter but the floor space area increasing at a rate of the square of the diameter increase, and that the file diameter is limited to the height of a standard door, files having a greater height not susceptible of convenient installation in an office.

Another way to increase the number of cards which may be carried in a single rotary file system, is to mount several of the circular files vertically one over the other, each of which is rotatable and each of which contains one or two annular rows of cards. This way of increasing the capacity of a file unit is disadvantageous for a number of reasons. For example, the circular files must be widely separated vertically in order that space enough remains for thumbing through, for viewing and for reaching into the file to withdraw the cards. Accompanying the wide spacings, of course, is a corresponding reduction in the utilization of space. Moreover, physical difficulties resulting from stretching, twisting and reaching, this time in the vertical direction, similar to those described above, are also encountered with several vertically superimposed circular files.

The foregoing and other disadvantages of the present filing systems and particularly known types of rotary files are overcome, in accordance with the invention, by providing a novel and improved rotary filing apparatus in which very large numbers of cards are readily accommodated and are available at a larger number of operator stations and in which cards can easily and quickly be located, removed and replaced. The rotary filing apparatus of the invention comprises a support member rotatable about a vertical axis, and a plurality of circular files each rotatably mounted on the support member. The circular files are preferably mounted on the support member in such a way as to be readily removable and replaceable, thus enabling changes of the circular files, for example, to allow substitution of files of differing sizes, files carrying different-sized cards, or files for different arrangements of cards or other information recording media. Further, the easy installation of the circular files permits a gradual increasing of the capacity by initially providing only a part of the total number of files and then adding files later as the need arises, or alternatively, by initially providing files of smaller diameter and later replacing them with larger files.

The circular files are arranged in two vertically superimposed tiers, the axes of rotation of each of the files of each tier lying on a circle concentric to the axis of rotation of the support member, and the axes of rotation of the files of one tier staggered in relation to the axes of rotation of the files of the other tier.

Each of the circular files includes suitable dividers for receiving the cards. For example, the files may have concentric circular dividers defining two or more annular concentric card receiving rows, each of the dividers having a height substantially less than the next inwardly circular divider, and a plurality of radially extending dividers in each of the annular rows. Alternatively, dividers can be arranged to provide a plurality of generally radially aligned rows. Instead of dividers, suitable bracketing or guides can be provided for mounting drawers or trays on

the circular files. In addition to cards, file folders or books can also be filed in the rotary filing apparatus of the invention.

Larger file units will generally have a powered drive for rotating the support member, whereas smaller units will have a hand rail for manual rotation.

For a better understanding of the invention, reference may be made to the following description of exemplary embodiments, taken in conjunction with the figures of the accompanying drawings, in which:

FIG. 1 is a plan view of one embodiment of the rotary filing apparatus;

FIG. 2 is an elevational view of the filing apparatus of FIG. 1;

FIG. 3 is a plan view of another embodiment; and

FIG. 4 is an elevational view of the embodiment of FIG. 3, partly in section, which is taken along the line 4-4 of FIG. 3, segments of the apparatus being removed for improved clarity of illustration.

Referring next to a typical embodiment of the invention with reference to FIGS. 1 and 2, a rotary filing apparatus includes a generally cylindrical base 10 having a plurality of spaced-apart mounting feet 12 for supporting the apparatus on a floor 14. The base 10 comprises a lower frame structure (not shown) on which a vertical shaft 18 is mounted such as by welding angles 20 to the shaft and the frame. Rotatably mounted on the fixed shaft 18 is a support member 26 which includes a central sleeve 28 received on the shaft and having a plurality of radially extending tapered arms 32 welded or otherwise secured thereto. The lower end of the sleeve rests on a thrust bearing 36 which is affixed to the shaft.

Six arms 32 on the support member 26 diverge radially at equal radial spacing (60° apart). Affixed to the ends of alternate arms 32 are relatively short vertical spindles or shafts 42 and affixed to the remaining arms 32 are longer vertical shafts 43. Each shaft is arranged to carry a rotatable circular file 46, the short shafts 42 carrying the files 46 in a lower tier immediately adjacent the support member and the longer shafts 43 carrying the files 46 in an upper tier. In other words, the filing apparatus has two vertically superimposed tiers of circular files, the files of each tier being staggered in relation to the files of the other tier because they are mounted on alternate shafts.

The circular files are installed on the shafts in such a way as to be easily and quickly installed, and also removed and replaced. Thus, they may be simply carried on the shafts without any retaining means, as illustrated, in which case, they are adequately held on the shafts by their own weight, or suitable securing means such as bolts threaded onto the ends of the shafts may be provided. Easy installation and removability enables expansion of the units as needed or replacement of the files with others of different sizes or carrying different sizes or arrangements of cards or other types of records.

The shafts 42 and 43 are preferably arranged to lie on a circle concentric to the central shaft 28 of the filing apparatus, in other words, equidistant from the shaft 28 so that the outermost points on the files will describe a single circle when the support member is rotated. Accordingly, any one of the files can be moved abreast of any of a plurality of operator station units 48, one of which is located radially outward of each file 46, and will be positioned at the same relative position with respect to that unit as any other file. The operator station units comprise desks and chairs (not shown) for the operators and any telephone or other communication equipment and the like useful in the operation of the file system.

All of the circular files 46 have the same diameters, the diameters being such that only a small distance exists between the points of closest approach of the files of each tier. Accordingly, the maximum card capacity for a given floor area occupied by the filing apparatus is obtained.

Each of the circular files 46, best shown in FIG. 1, and

file 46' in another embodiment of the invention shown in FIGS. 3 and 4, in which elements similar to those of FIGS. 1 and 2 have been identified by primed reference numerals, comprises a base plate 50 which has a central opening receiving a sleeve 52. The sleeve 52 is surrounded by a top plate 54 and is positioned on the shaft 42, with suitable bearings (not shown) between the sleeve 52 and the shaft 42 to facilitate the rotation of the files.

The circular files 46 include two concentric annular card receiving rows adjacent the perimeter of the base plate 50. The inner row is defined by an inner circular divider 56, which extends downwardly from the perimeter of the top plate 54, and by an intermediate circular divider 58. The outer annular row is defined between the intermediate divider 58 and an upwardly extending circular flange 60 formed about the perimeter of the base plate 50. The circular dividers 56 and 58 and the flange 60 are, respectively, of decreasing height to facilitate the replacement of cards in the circular file.

The annular card receiving rows are subdivided into radial segments by, first of all, major radial dividers 62 which extend outwardly from the innermost circular divider 56 to the outer flange 60 and secondly, by additional radial dividers (not shown), to further subdivide each segment defined between the major dividers 62. Such additional dividers may have tabs to be received in slots 64 (as shown in the lowermost circular file of FIG. 3) formed in the base plate 50 and slots 66 in the inner circular divider 56. Accordingly, the user may readily install the additional dividers if desired, or may omit them, as shown.

The embodiment of FIGS. 3 and 4 of the rotary filing apparatus includes, in addition to the small diameter circular files 46', an upper large diameter circular file 68. The main support shaft 18', accordingly, extends upwardly and receives the large diameter file 68 on a thrust bearing 70. The file 68 is substantially the same in structure as the small diameter circular files 46' except for the arrangement of radial dividers. The provision of the supplemental large diameter file increases the capacity of the FIGS. 3 and 4 embodiment of the invention.

In use, any one of the circular files 46 is brought abreast of any one of the operator station units 48 by rotating the support member 26. In the embodiment of FIGS. 1 and 2 the support member 26 is arranged for manual rotation by the provision of a handrail 80 attached to the radial arms 32 of the support member 26. In the embodiment of FIGS. 3 and 4, a power drive for the support member 26' is provided which includes a gear 82 secured on the lower end of the central sleeve 28' of the support member 26', a reduction gear unit 84 coupled to the gear 82 and a motor 86 driving the reduction gear unit.

The support member 26' may be selectively driven to bring a given circular file 46' to a desired position by providing a control system which includes a control unit 88 at each operator station unit 48'. Control systems suitable for this purpose are well known to those skilled in the art and therefore need not be described in detail herein.

The rotary filing apparatus, according to the invention, provides a number of very significant advantages over the presently known file systems. For one thing, each circular file is of relatively small diameter and therefore may be rotated with a minimum of effort, being of relatively light and simple construction, and can easily be assembled and disassembled. More importantly, the filing capacity of the total projected floor area accommodated by the filing unit and within a given reach dimension of an operator is very greatly increased. For example, a pair of vertically stacked, large diameter circular files having two annular card-receiving rows accommodates cards only at a narrow annular band at the perimeter. In the filing apparatus of the invention,

of similar overall diameter, cards are carried in several pairs of annular card-receiving rows which extend into the interior region of the unit and therefore occupy a relatively large proportion of the projected floor area of the unit. It is thus apparent that the filing apparatus of the invention can, within a given overall volume of space, accommodate a larger number of cards than presently known units used for similar purposes.

A further advantage of the filing apparatus is that the cards are more readily viewed and removed than in conventional systems. The circular files are relatively small and therefore have a relatively large curvature. Thus, the outer edges of the cards are not as tightly packed as in larger circular files and can accordingly be spread or flipped through more easily and more widely to facilitate viewing the indexed information therein. Moreover, the files of each tier can be relatively closely spaced vertically and the cards in each tier are accordingly viewed along similar lines by sight rather than the widely varying lines of sight afforded by conventionally stacked large diameter circular files.

Another feature of the rotary filing apparatus according to the invention is that the distance an operator must reach to locate and withdraw cards is small. More particularly, the support member is rotated to bring a circular file adjacent the operator. When a particular file is adjacent the operator, it will be necessary for her to reach across only one outer row at most, and because the larger diameter outer card row contains a substantially larger number of cards than the inner row, cards being sought will more frequently be in the outer row and she will have to reach only a short optimum distance. Moreover, the vertical reach required differs only between the two tiers, which will generally be, at most, about 4 or 5 inches. Therefore, it will be unnecessary for an operator to reach over a range of, say, not more than 6 to 8 inches laterally and 4 to 5 inches vertically.

Another advantage of the apparatus is its versatility. More particularly, a purchaser may initially require only a relatively small part of the total possible capacity of the filing apparatus. In this case, the unit when purchased may include only one tier of circular files or, alternatively, only two or three of the circular files of each tier, thus reducing the initial capital outlay for the filing apparatus. As the need for additional card space increases, additional circular files can be added. Also, small diameter files can initially be provided and then gradually replaced by larger ones. The ease of removability and replacement of the circular files facilitates expansion of capacity and change in the information media filed.

The filing apparatus of the invention is also less costly to manufacture and install. More particularly, the individual units, particularly, the circular files 46, 46', are relatively small in size compared to presently known circular files. Therefore, they need not be as structurally strong and can be constructed of lighter gage metals or plastics. Moreover, the elements of the apparatus, because of their relatively smaller size, can more easily be transported and can readily be assembled in place.

It will be understood that the above described embodiments of the invention are meant to be merely exemplary and are susceptible of many modifications and variations by those skilled in the art without departing

from the spirit and scope of the invention. All such modifications and variations are intended to be included within the scope of the invention as defined in the appended claims.

I claim:

1. A rotary filing apparatus comprising a horizontally disposed support member rotatable about a vertical axis, a plurality of vertical shafts affixed at equally spaced-apart locations on said support member and spaced at equal distances from the axis of rotation of said member, a plurality of circular files arranged in a first tier and rotatably mounted on alternate ones of said shafts and a plurality of circular files arranged in a second tier and rotatably mounted on the remaining shafts, the files of said second tier overlying substantial segments of the adjacent files of said first tier.

2. A rotary filing apparatus according to claim 1, wherein each of said circular files includes dividers defining a plurality of card-receiving rows.

3. A rotary filing apparatus according to claim 1 wherein said circular files are removably received on said vertical shafts.

4. A rotary filing apparatus according to claim 1 further comprising a central vertical shaft, said support member being mounted on said shaft, and a rotatable circular large diameter file mounted at the upper end of said central shaft above said second tier.

5. A rotary filing apparatus according to claim 1 further comprising powered means for selectively rotating said support member.

6. A rotary filing apparatus according to claim 1 further comprising an operator station unit positioned radially outwardly of and adjacent each of said circular files.

7. A rotary filing apparatus comprising a support member rotatable about a vertical axis, a plurality of vertical shafts mounted on said support member, the shafts being spaced from each other and from the axis of rotation of said member, a plurality of first circular files arranged in a first tier and rotatably carried by alternate ones of said shafts and a plurality of second circular files arranged in a second tier and rotatably carried by the remaining shafts, the files of said second tier overlying substantial segments of the adjacent files of said first tier.

8. A rotary filing apparatus according to claim 7 wherein the outermost points, with respect to the said vertical axis of the support member, on the perimeters of the circular files are substantially equidistant from the said vertical axis.

9. A rotary filing apparatus according to claim 7 wherein the vertical shafts are substantially equidistant from the axis of rotation of the support member and wherein the circular files are of substantially the same diameter.

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