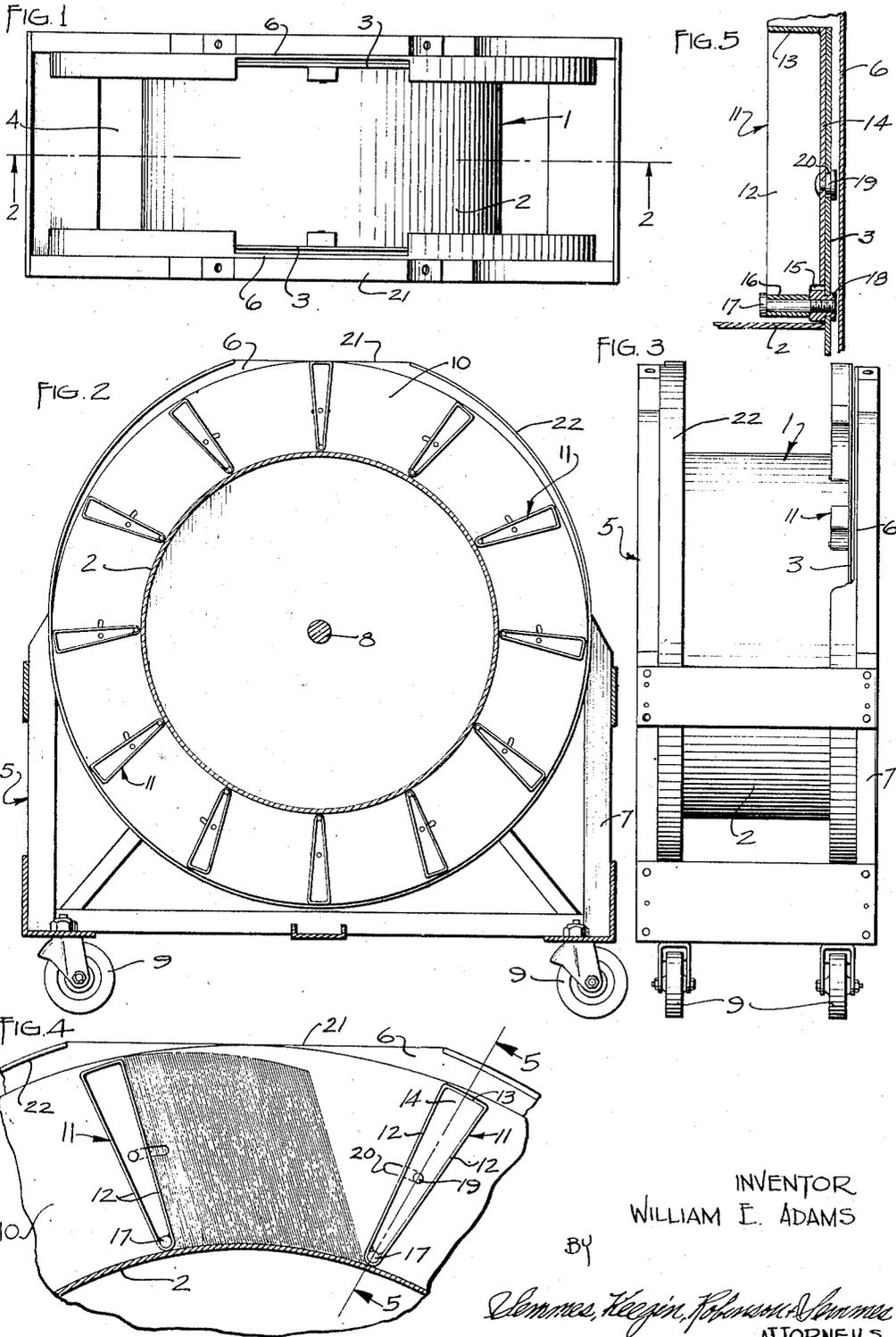


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CARD FILING APPARATUS

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CARD FILING APPARATUS

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This invention relates in general to rotary filing apparatus. More particularly, the invention has reference to filing apparatus in which a file card receiving channel is provided on the periphery of a rotary drum divided into a circumferential series of segments and is a continuation-in-part of my copending application Ser. No. 637,873 filed December 29, 1945.

Filing apparatus of the type to which the present invention relates generally comprises a supporting structure in which a cylindrical drum is rotatably mounted. File cards are more or less radially supported at the surface of the drum. Various means have been proposed for holding the cards sufficiently loosely on the drum to permit riffling or spreading of the cards for inspection, and yet prevent those on the lower side of the drum falling out. The holding means must also be such as to permit removal or insertion of one or a group of cards for posting or transferring to or from other locations.

The means heretofore proposed for holding the cards on the drum, which will secure the above results, has been a peripheral rail or rails secured to the drum and engaging perforations or key-hole slots in the lower edge of the cards. This, however, is subject to several disadvantages. In the first place, the rail, even in a simple form, is expensive to manufacture. Likewise, a punched or slotted card requires an expensive paper stock and must be accurately cut. Moreover, the punched portion of the card destroys useful surface. Then too, where continuous rails are used with key-hole slotted cards, only one or two may be removed from the rail at a time because of the flexing necessary to disengage the slot from the rail.

It has been found that in rotary filing apparatus employing drums of relatively small diameter or those in which the ratio of the depth of the file card receiving channel to the radius of the drum is about 1 to 2, such as disclosed in the above named application, there is sufficient difference between the inner and outer arcs of the segments or compartments of the card receiving channel to provide sufficient fanning of the cards to give reading space between adjacent cards even though the segments or compartments are filled to capacity. On the other hand, difficulty is encountered in constructions employing drums of large diameter or particularly where the ratio of the depth of the file card-receiving channel to the radius of the drum is about 1 to 3 or less. In other words, in constructions in which the difference between the inner and outer arcs of the

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segments or compartments of the card-receiving channel is small or insufficient to provide a proper fan or reading space for the cards, the compartments cannot be filled to capacity.

The principal object of the present invention is to provide an improved rotary file apparatus in which drums of relatively large diameter or in which the ratio of the depth of the card-receiving channel to the radius of the drum is about 1 to 3 or less and in which the segments of said channel may be filled to capacity with file cards and yet provide ample space for riffling or fanning the outer edges of the cards.

Another object of this invention is to provide a drum construction for a rotary filing apparatus in which the drum is provided with a peripheral card-receiving channel circumferentially divided into a plurality of compartments by pivotally mounted partitions.

A further object of this invention is to provide a drum construction for rotary filing apparatus in which movable partition means are provided in a peripheral card-receiving channel to divide said channel into a plurality of compartments.

Still another object of this invention is to provide a drum construction for a rotary filing apparatus in which the drum is provided with a peripheral card-receiving channel and in which movable partitioning means are provided to form compartments, the inner arc of which is of substantially constant length and the other arc of which is of variable length.

Yet another object of the invention is to provide a rotary card filing apparatus of the above character, in which relatively fixed, arcuate card retaining strips are provided overlying opposite sides of the card-receiving channel for engaging opposite corners of the cards therein to restrain outward displacement of the cards therefrom, the strips being concentric with the channel on the lower sector and diverging slightly outwardly from the channel on the upper sector.

With the above and other important objects and advantages in view, which will become more apparent during the course of the following description, the invention consists in the parts and combinations hereinafter set forth with the understanding that various changes may be made therein such as in the size, shape and arrangement of the parts, without departing from the spirit of the invention.

In order to make the invention more clearly understood, a preferred embodiment thereof is shown in the accompanying drawings.

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In the drawings:

Figure 1 is a top plan view of the rotary card file.

Figure 2 is a vertical transverse sectional view taken on the line 2—2 of Figure 1 looking in the direction of the arrows.

Figure 3 is a side elevational view.

Figure 4 is an enlarged fragmental sectional view of the upper portion of the file indicating a stack of file cards in one of the pockets.

Figure 5 is a cross sectional view taken on the line 5—5 of Figure 4.

Generally the invention comprises a drum having opposed end flanges which project beyond a central cylindrical hub of relatively large diameter and form, with the hub, a peripheral channel for the reception of file cards arranged more or less radially therein. The file cards are segregated into groups in the receiving channel by means of opposed pairs of separators or relatively narrow partitions which are pivotally attached respectively to the inner faces of the opposed end flanges of the drum adjacent the hub. The outer end of each partition is free to move through a limited arc. These partitions divide the channel into a number of more or less radial pockets, the inner circumferential lengths of which are constant but the outer lengths of which may be lengthened to a limited amount at a desired inspection point on the drum to permit adequate fanning of the cards for inspection of individual cards of a group substantially filling the pocket at the bottom thereof.

The cards on the lower sector of the drum are prevented from falling out of the channel by engagement, at opposite corners of the cards, with a pair of relatively fixed retaining strips which overlap laterally the drum flanges and surround the same except for a space approximately the length of a pocket at the top of the drum. The separating partitions not only serve to segregate the cards into groups, but also to restrict rotation of the whole group of cards with respect to the drum, whereby the cards in the lower sector of the drum, by engaging the fixed retaining strips, serve as a friction break to retain undesired rotation of the drum. The drum is mounted for rotation about a horizontal axis in a mobile frame or carriage.

In the specific embodiment illustrated in the drawings, there is provided a card carrying drum, indicated generally as 1, and which comprises a central cylindrical hub 2 having opposed radial end flanges 3 secured thereto. The flanges 3 form with the hub 2 a peripheral channel 4 of rectangular cross section for the reception of conventional file cards.

The drum 1 is adapted for rotation about a horizontal axis in a mobile support structure, designated generally as 5, and which comprises a pair of substantially circular vertical end plates 6 held in spaced parallel relationship to each other by a rectangular frame 7. Preferably, the drum is provided with a central transverse shaft 8 which extends through the end flanges 3 and the plates 6 and is rotatably journaled in suitable bearings, not shown, but mounted on the frame 7. The frame 7 is provided with casters 9 by means of which the file may be easily moved from one location to another.

The drum 1 is of relatively large diameter to accommodate a substantially great number of file cards, the diameter of the central hub 2 preferably being about three times the depth of the channel 4. As will be noted in Figure 4, the depth

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of the channel 4 is substantially equal to the height of the file card.

The file cards are positioned more or less radially in the channel 4 and, to restrain rotation of the group of file cards with respect to the drum, and for ease in handling the individual cards for inspection, posting, etc., the channel 4 is divided into a peripheral series of more or less radial pockets 10 each adapted to contain a sub-division of the whole group of cards. In this connection, it may be pointed out that a sub-division or group of the cards preferably contains a sufficient number of cards to substantially fill the bottom of the pocket but fit loosely enough to permit free sliding movement in the pocket.

The above circumferential division of the channel 4 is conveniently accomplished by means of a series of opposed pairs of separators or partitions, designated generally as 11, and attached respectively to opposite inner faces of the drum flanges 3 for engaging the opposite ends of the file cards. The partitions should be narrow enough laterally to permit easy handling of the cards. The number of pockets into which the channel 4 is divided is preferably such, so that the peripheral length of the bottom of each pocket is substantially equal to or slightly less than the depth of the pocket to prevent cards in the pocket from tumbling over if the pocket is only partially filled.

In relatively small card files of this type, such as disclosed in the above application, Serial No. 637,873, where the peripheral channel is divided into relatively few pockets, the difference between the lengths of the pocket at the bottom thereof and the length at the periphery of the drum will be found to be sufficiently great to permit riffling or fanning for inspecting the faces of a group of cards substantially filling the bottom of the pocket. In such cases, the separating partitions may be rigidly secured to the side walls of the card-receiving channel. For ease in handling the individual cards or groups thereof, it is desirable to keep the length of pockets at the bottom thereof, substantially equal to the height of a file card as set forth above. It will be understood therefore, that as the size of the drum increases, if the lengths of the pockets at the bottoms are kept substantially equal to the height of the file card, the number of pockets in the peripheral series will have to be increased. With increase in the number of pockets, the included angle between the fixed partitions will become less, or in other words, adjacent partitions will become more parallel, decreasing the length of the pocket at the periphery of the drum and thereby restricting the amount of fanning of the cards. To overcome this difficulty, the separating partitions 11 are pivotally adjusted at their inner ends to the side flanges 3 which will allow the outer ends of the partitions to be moved away from each other and thereby permit increasing the outer length of a selected pocket while still maintaining a fixed length at the bottom of the pocket.

Preferably the partitions 11 are bent from sheet metal strip in the form of a relatively narrow isosceles triangle to form side walls 12 and a base wall 13. Secured to the rear edges of these walls is a triangular back wall 14. As seen in Figure 5, the rear portion of the partition member is cut away at the apex to form a recess 15, while secured to the apex of the partition is a short tube 16 which extends from the front edge of the side walls 12 to the edge of the recess 15. Each of the partitions 11 are exactly alike and are at-

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tached to the flange 3 by means, such as a headed screw 17, which passes rearwardly through the tube 16 and is threaded into a short boss 18, affixed into an aperture in the flange, spaced slightly outwardly from the hub 2 so that the apex of the partition lies closely adjacent the hub. In order to limit the angular movement of the partitions 11 about their pivot screws 17, each is provided with a short pin 19 affixed in the rear wall 14 and extending through an arcuate slot 20 in the flange 3 concentric with the screw 17. Preferably the slot is of a length to limit the movement of the partition to about five or ten degrees on each side of a radial line passing through the pivotal axes of the drum and partition.

The side plates 6, in their lower sectors, are concentric with the drum 1 and are of slightly larger diameter than the drum flanges 3. In the upper sectors, however, the diameter of the side plates gradually increases to opposite ends of a flat, designated as 21, at the top of the side plate. The length of this flat is approximately the length of the maximum outer length of one of the pockets 10. Secured to the peripheral edge of each of the side plates 6 and surrounding the same from one end of the flat 21 to the opposite end, is a smooth metal strip 22 which projects laterally inwardly of the end plates 6 sufficiently to overlap the flanges 3 and engage opposite corners of the file cards and prevent those from falling out of the pockets on the lower section of the drum.

By virtue of the shape of the end plates 6, the retaining strips 22 follow the peripheral contour of the drum concentrically about its lower half. From the horizontal center of the drum, however, as seen in Figure 2, opposite ends of the strips 22 diverge slightly away from the periphery of the drum to the space between the ends of the strips at the top of the file. In addition to retaining the cards in the pockets on the lower sector of the drum, the retaining strips also serve, by engagement of the cards therewith, as friction brake bands for the drum to restrain undesirably free rotation, overriding and rocking to a stop when the drum is rotated.

By referring to Figure 2, it may be easily visualized that cards in the pockets 10 on the descending side of the rotating drum, as soon as the trailing face of the leading partitions 11 inclines below the horizontal, will gradually move outwardly into contact with the strips 22 until, at the bottom of the drum, the entire weight of the cards in the lower pockets will bear against these strips. As the drum continues to rotate and the cards pass the horizontal center of the drum on the ascending side, they successively move out of contact with the retaining strips 22. Therefore, in addition to preventing the cards dropping out and serving to frictionally brake the drum, the strips serve also on the descending side of the drum, in the upper sector where the strips converge toward the drum, to force any raised cards into alignment with the stack and against the hub 2, and on the lower sector of the ascending side of the drum maintain the cards evenly stacked until they pass above the horizontal. It will be noted also in Figure 5, that the triangular shape of the partitions 11 and the limited degree of their angular movement, assures that the upper faces of the partitions in the upper half of the drum will be inclined upwardly from the horizontal center line of the drum until the upper faces substantially reach the concentric portion

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of the strips 22. This is advantageous, particularly on the descending side of the rotating drum in inhibiting tumbling of the cards in their pockets and inhibiting the cards from sliding outwardly into engagement with the converging arc of the strips 22.

The operation of the card file, it is believed, will be apparent from the foregoing. It might be pointed out, however, that the operator rotates the drum either by the upper edges of the cards or the partitions until a desired group or pocket of cards registers with the space between the ends of the strips 22 at the top of the file. The braking effect between the cards in the lower part of the drum and the retaining strips 22 will hold the drum in this position permitting the operator the use of both hands in finding a particular card or cards desired in the group. The spreading or lengthening of the mouth of the pocket, provided by the movable partitions, permits adequate space between the outer ends of the partitions to fan or spread apart the upper edges of the cards to find the desired one, while the fixed distance between the bottom ends of the partitions maintains the lower edges of the cards evenly aligned and prevents tumbling of the stack.

From the foregoing it will also be seen that a file constructed in accordance with this invention makes it possible for the operator to take a single card from the file or to remove an entire stack, if desired. The construction permits the transfer of ordinary file cards from a file drawer or cabinet, for instance, to the rotary file without any modification to the card, such as punching, slotting or notching, which would be necessary in using ordinary file cards with the rotary card files heretofore proposed and in use which employ card retaining rails or similar devices on which the cards are threaded. This is an important advantage in that cards cut from a much cheaper paper stock may be used and much faster filing operations may be performed because the cards are simply lifted out and inserted at the upper access portion of the file.

I claim:

1. In a card filing apparatus of the character described, a cylindrical drum rotatable about a horizontal axis and having a substantially rectangular peripheral channel therein for the reception of file cards, relatively fixed strip means having a mid-portion concentric with at least the lower half of said drum and having diverging ends, said strip means overlying respectively opposite sides of the channel for engaging opposite corners of cards therein to restrain outward movement of the cards from the channel, and wedge shaped partition means pivoted adjacent the inner portion of said channel for dividing said channel into a circumferential series of segments, and means for limiting pivotal movement of the partition means so that the angular faces thereof at the limits of said pivotal movement lie substantially radial of the drum.

2. In a rotary filing apparatus a cylindrical drum having end plates projecting beyond the outer periphery of said drum and cooperating therewith to form a peripheral channel for the reception of file cards, means supporting said drum for rotation about a horizontal axis, a circumferential series of spaced wedge shaped partition means in said channel, pivot means carried by said end plates adjacent the outer periphery of said drum for mounting said partition means for pivotal movement, said end plates having arcuate slots between the outer periphery

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thereof and the pivot means, and means carried by said partition means and cooperating with said slot for limiting pivotal movement of said partition means, said slots extending on opposite sides of a radial line passing through the rotational axis of the drum and the pivotal axis of a partition to limit the pivotal movement of the partition so that the angular faces of the partitions at the limits of pivotal movement thereof will substantially coincide with said radial line, and means overlying the channel at the lower half of the drum to restrain outward movement of the cards.

3. In a card filing apparatus of the character described, a cylindrical drum rotatable about a horizontal axis and having a substantially rectangular peripheral channel therein for the reception of file cards, a circumferential series of equispaced wedge shaped partitions pivoted at their inner ends adjacent the bottom of the channel and dividing the channel into a circumferential series of segments, the depth of said channel being substantially equal to the height of a card received therein and the diameter of the drum at the bottom of the channel being at least three times the depth of the channel and the circumferential length of a segment at the bottom of the channel being not greater than the depth of the channel, means limiting the pivotal movement of each partition so that the angular faces thereof at the limits of pivotal movement lie substantially radially of the drum, and means concentric with the drum and overlying the channel at least in the lower half of the drum to restrain outward movement of the cards.

4. In a rotary filing apparatus a cylindrical

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drum having end plates projecting beyond the outer periphery of said drum and cooperating therewith to form a peripheral channel for the reception of file cards, means supporting said drum for rotation about a horizontal axis, a circumferential series of spaced wedge shaped partitions means in said channel, pivot means carried by said end plates adjacent the outer periphery of said drum for mounting said partition means for pivotal movement, means for limiting the pivotal movement of each of said partition means on opposite sides of a radial line containing the rotational axis of the drum and the pivotal axis of the partition means so that the angular faces of the partition means at the limits of said pivotal movement will substantially coincide with said radial plane, and means overlying the channel at least at the lower half of the drum to restrain outward movement of the cards from the channel.

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