Oct. 7, 1952 B. DISCOUNT 2,612,970

BRAKE ASSEMBLY FOR ROTARY CARD FILES

Filed May 9, 1950

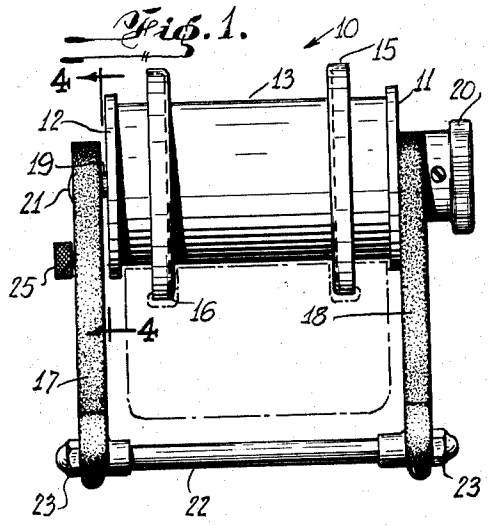


Fig. 1.

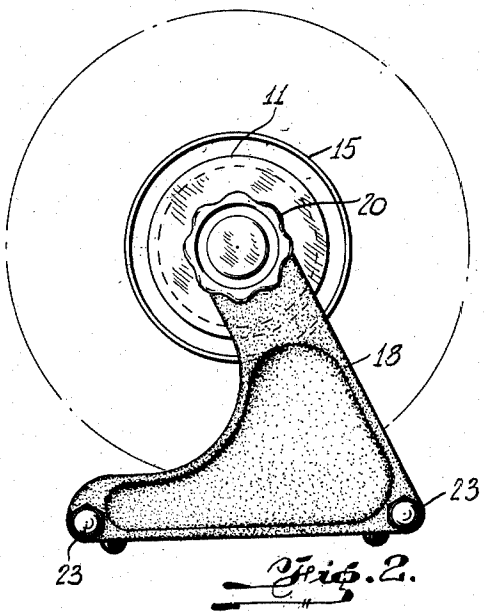


Fig. 2.

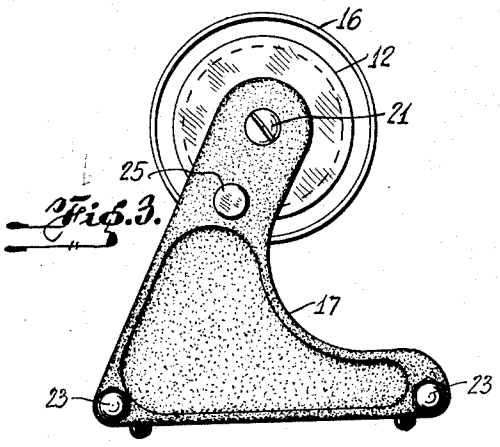


Fig. 3.

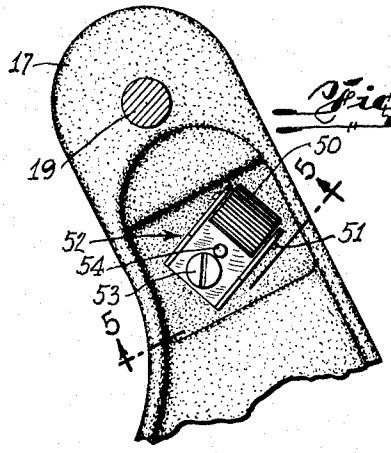


Fig. 4.

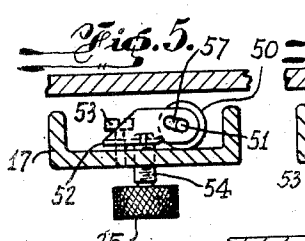


Fig. 5.

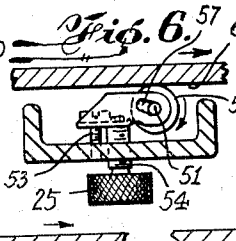


Fig. 6.

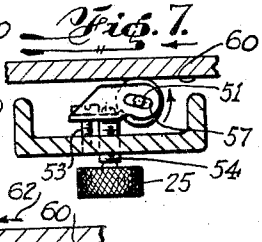


Fig. 7.

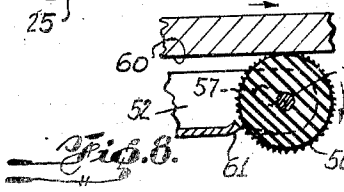


Fig. 8.

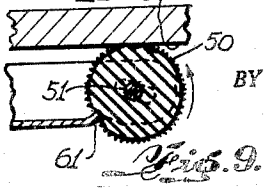


Fig. 9.

INVENTOR.
BERNARD DISCOUNT.
BY
Avery Freeman
ATTORNEY.

Patented Oct. 7, 1952 2,612,970

UNITED STATES PATENT OFFICE

2,612,970

BRAKE ASSEMBLY FOR ROTARY CARD FILES

Bernard Discount, Jamaica, N. Y.

Application May 9, 1950, Serial No. 160,870

3 Claims. (Cl. 188—82.84)

1

This invention relates to an improved brake assembly.

In general, the purpose of the present invention is to provide a brake assembly particularly suited for use in connection with rotary card indexes, but not limited thereto.

It is an object of the invention to provide a brake which, when applied to the card-carrying drum of a rotatable index, will permit free rotation of the drum in one direction, but will restrain rotation thereof in the opposite direction. The brake is preferably constructed in such manner that the drum may be rotated backwardly upon the application of deliberate pressure in that direction, but free rotation will be restrained. A brake of this device is advantageous, because it has been found that the disposition of the cards upon the periphery of the drum gives the drum a tendency to rotate in a direction away from the operator and rock to a stop. This tendency is explained by the fact that an operator spreads the cards apart at a point below the top of the drum on the forward portion of the periphery, and consequently forces a greater number of cards to the rear side of the drum than are present on the front side. The weight of the increased number of cards on the rear peripheral portion of the drum naturally gives the drum a tendency to rotate rearwardly to balance itself. Also, because the cards move freely on the rod, they naturally, by their own weight, tend to pack in the lower half of the drum and to loosen at the highest point, causing the greater number of cards always to be on the rising portion of the wheel, thus increasing the rearward rotational tendency. This usually is inconvenient to the operator because the drum must be held by hand against rotation when a particular card is being inspected. In accordance with my invention, the brake device permits the drum to be rotated forwardly with ease, but prevents its natural backward rotation, unless deliberate pressure in that direction is applied, with the result that, after a particular card has been exposed to view by spreading the cards apart, the drum need not be manually retained in place. But, realizing that occasionally it is more convenient for the operator to have the drum capable of free rotation in both directions, the brake has been further constructed in such a manner that its action may be completely suspended under control of the operator. For analogous reasons, provision has been made to lock the drum completely against rotation in either direction.

More specifically, it is an object of the invention to provide a brake which, when engaged with a movable surface, such as the end plates of a rotary card-retaining drum, will permit said surface to move freely in one direction but will effectively inhibit motion in the reverse direction.

2

Still another object is to provide a simple brake of the aforesaid nature which is characterized by the ability to create a braking force which automatically increases with the need therefor.

The invention consists generally in providing a roller capable of making rolling engagement with the moving surface to be braked. The roller is preferably made of soft rubber, and has its surface corrugated or otherwise roughened. It is provided with a through shaft, the ends of which are mounted in slots in the opposing arms of a U-shaped member. The arrangement thus provides a mounted roller capable both of rotation about its axis and bi-directional movement in a plane perpendicular to said axis. Means are provided for adjustably maintaining said U-shaped member adjacent the surface to be braked. The positioning of the slots on the U-shaped piece and the positioning of the latter with respect to the movable surface is arranged to place the axis of the roller at right angles to the direction of movement of the surface and parallel to said surface while the plane of said bi-directional movement makes an acute angle with said moving surface.

As a result of the above arrangement, the roller shaft will be urged to one end or the other of the aforesaid slots depending upon the direction of rotation of the roller as imparted by contact with the moving surface. It is thus obvious that in one direction the roller will be urged closer to the moving surface, while the reverse will be true for the opposite direction of movement.

The U-shaped member is provided further with an element which will engage the surface of the roller when the latter is urged to that end of the slots which is closer to the moving surface. This element is so placed with respect to the slots that the contact pressure is increased by the movement of the roller shaft during the braking operation. As a result, rotation of the roller is prevented by said element and the roller in turn imparts a frictional braking force to the moving surface. When the direction of movement of the surface is reversed, the roller is disengaged from the stop element and, therefore, rotates freely, no longer providing the braking action.

In addition, means are provided for retracting the brake assembly so as to eliminate all contact between it and the movable surface in order to provide complete freedom of movement.

This same means can also be employed to jam the roller and its mounting against the movable surface so that the surface of the roller making the frictional contact is flattened. This flattening prevents rotation of the roller and, therefore, it will impart a frictional braking force against movement in either direction.

The invention will be better understood after reading the following detailed description, taken in connection with the accompanying drawing from which further features and advantages will be readily apparent.

In the drawing:

Fig. 1 is a front elevation of a rotary card file showing one application of the brake assembly.

Fig. 2 is an end elevational view of the right side of Fig. 1.

Fig. 3 is an end elevational view of the left side of Fig. 1.

Fig. 4 is a sectional view taken on line 4—4 of Fig. 1 showing the brake mounting.

Figs. 5, 6, and 7 are fragmentary sectional views taken on line 5—5 of Fig. 4, showing the brake under different operating conditions.

Figs. 8 and 9 are enlarged fragmentary sectional views similar, respectively, to Figs. 6 and 7, illustrating further details.

Reference will now be made to the drawing in more detail. In Figs. 1, 2 and 3, a rotary drum is indicated generally at 10, consisting of end plates 11 and 12 and a cylindrical body 13. Two card-retaining rails 15 and 16 are supported at spaced intervals on the body of the drum. The rails consist generally of a circular web extending radially from the surface of the drum and a laterally extending flange at the free edge thereof. Obviously, any suitable rail and web structure may be employed, and the structure of the rotary drum forms no part of the present invention. The drum is fixedly mounted in any suitable manner on a shaft 19 which in turn is supported at its ends in supports 17 and 18. One end of the shaft extends through and beyond its support 18 and terminates in a knob 20. The knob is fixedly mounted on the shaft to facilitate rotation of the drum by the operator. The other end of the shaft terminates flush with the outer surface of the support 17 and is locked against withdrawal by means of screw 21 threaded into its end. The supports are maintained properly spaced and rigid by means of threaded tie rods 22 secured by nuts 23. The position that would be assumed by cards mounted on the drum is indicated by phantom lines in Figs. 1 and 2. At 25 is indicated the knurled knob for adjusting the brake, the details of which will be hereinafter clearly set forth.

The rotary card file described in detail above has been taken solely by way of example of a particular application of my novel brake assembly, but from the description which follows, it will be obvious that the brake could be applied to any arrangement of relatively moving parts.

Now referring to Fig. 4, it will be seen that the brake unit is mounted in a recess in support 17 so that it can be completely retracted from engagement with end plate 12. It consists of a roller 50, a shaft 51, a U-shaped mounting 52, a screw 53 and a threaded stud 54, the details of which are clearly illustrated in Fig. 5. The roller is preferably made of soft rubber and has its surface corrugated or fluted, as shown, but, obviously, may be made of any suitable resilient material. It is mounted on the shaft 51 which

in turn is mounted in the slots 57 in the U-shaped mounting. The mounting 52 is provided further with an oversized hole which freely rides along the shank of the screw 53. As will appear hereinafter, the screw 53 could be replaced by a headed pin which may be force-fitted into support 17. The threads along the shank portion of screw 53 serve no useful purpose except at the free end thereof where it threadedly engages support 17.

Another hole is provided in mounting 52, substantially at the center thereof, through which the reduced end of stud 54 may loosely extend. Said extended end is peened over to revolubly secure stud 54 to mounting 52. With the above arrangement stud 54, which threadedly engages support 17, may be rotated by means of its knurled head 25 whereupon mounting 52 will be projected from or retracted to the inner surface of support 17.

As shown in Fig. 5, the mounting is retracted, while in Figs. 6 and 7 the mounting is shown in its operative or projected position adjacent the surface 60 which is to be controlled. Starting with the retracted position in Fig. 5, it is evident that rotation of stud 54 will urge the mounting away from support 17, the mounting sliding along the body of the screw 53. Finally a point will be reached where the roller abuts the surface 60 and the opposite end of the mounting abuts the head of the screw 53. Further movement of stud 54 would tend to swing the mounting 52 about the head of the screw as a pivot if it were not for the retarding force imparted by contact of the roller with surface 60.

The operation of the brake is illustrated in Figs. 6 and 8, wherein the surface 60 is moving in the direction which is to be unrestrained. The relative motions of the parts are indicated in the figures by the arrows. As shown, the roller assumes a position wherein its shaft is at the ends of the slots 57 which are remote from the surface 60. As will be obvious from Fig. 8, the roller 50 maintains contact with the surface 60 but clears the upwardly extending edge or finger 61 of the mounting 52.

When the relative movement of the parts is reversed, the condition depicted in Figs. 7 and 9 is assumed. The roller shaft 51 rolls up the side of the slots 57 to thereby press firmly against surface 60 and to jam against the edge or finger 61. Roller 50 can no longer rotate and, therefore, inhibits the further movement of surface 60 in the direction of the arrow 62. But it is obvious that if sufficient force is applied to the surface 60, the friction applied by the roller will be overcome.

One further condition of operation remains to be explained. If stud 54 is rotated sufficiently, roller 50 will be jammed hard against surface 60 thereby flattening out the roller surface. In this condition, the roller can no longer be rotated under control of the movable surface and will effectively inhibit motion of the surface 60 in either direction.

Although the finger element 61 is shown as an edge of the mounting 52 which has been bent upwardly, it will be obvious that the bend may be eliminated without seriously affecting the operation of the brake. All that is required is to properly position the relative locations of the edge 61 and the slots 57 so as to obtain the one-way locking action. In the instant embodiment, I have found that more positive locking of the

roller can be obtained by imparting the slight curvature to the finger element.

From the above description, it will be clear that I have provided, not only a novel brake combination, but a unique mounting therefor, whereby the brake mounting is always maintained substantially parallel to the surface to be controlled. This is important in order to maintain the optimum angular relationship between the slots **57** and the surface **60**.

The angle of the slots **57** is not at all critical and, in fact, the brake could work with the slots located parallel to the surface **60**. But with the latter construction, there would be eliminated one of the desirable features of the present invention. That is, the roller would no longer be urged toward the surface **60** when braking force is required, and the efficiency of the device would thereby be decreased.

Although a preferred embodiment of the invention has been described and illustrated, it is anticipated that the brake assembly may be used in various combinations. For example, the roller may be applied to the surface of a cylinder rather than to a plane surface, all that be required is that rolling contact be made with the surface to be controlled. In the latter case, the roller shaft should be positioned parallel to and in the same plane as the axis of the cylinder being regulated.

Having now described in detail a preferred embodiment of my invention from which numerous modifications and alterations will appear obvious to those skilled in the art to which it appertains without departing from the scope and spirit of the appended claims, I desire to secure by Letters Patent, and, therefore, claim:

1. The combination with a braking device for controlling the movement of a surface moving relative thereto, of means for projecting said device toward and retracting said device from said surface comprising a support member positioned adjacent said surface and spaced therefrom and having a through threaded bore therein; a stud having threads intermediate its ends, and including means at one end for facilitating manipulation thereof, and a reduced diameter at the other end thereof for rotatable engagement with said device, said stud threadedly engaging said bore with said reduced end on the side of said support nearest said surface; and a stop and guide member having a shank and a head at one end thereof and having its shank extending loosely through a hole in said device and its free end secured in said support on the side nearest said surface for making sliding engagement with said braking device whereby to prevent rotation thereof relative to said support and to limit the extent of projection from said support.

2. The device as set forth in claim 1, wherein said means for facilitating manipulation of said stud comprises a knob integral with said one end, which projects from the side of said support furthest from said surface.

3. An adjustable mounting for a device for controlling the motion of a plane surface moving relative thereto comprising a support member positioned parallel to said plane surface and spaced therefrom and having a through transverse threaded bore therein; a stud having threads intermediate its ends and including means at one end for facilitating manipulation thereof, and a reduced diameter at the other end thereof, said stud threadedly engaging said bore with said reduced end on the side of the support nearest said plane surface; a motion controlling device supported by said stud and having a first hole through a base portion thereof near one free edge and a second hole through said base portion near the other free edge thereof, each of said holes being equally spaced from the sides of said motion controlling device, the reduced end of said stud passing through said first hole and being peened at its extremity to prevent withdrawal but being freely rotatable in said hole, a pin passing through said second hole with its free end fixedly engaged in said support member and its head spaced therefrom, the diameter of said pin being less than the diameter of said second hole.

BERNARD DISCOUNT.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
138,881	Gladney	May 13, 1873
138,897	Kimball	May 13, 1873
1,718,074	Reece et al.	June 18, 1929
1,940,595	Johnson	Dec. 19, 1933
2,226,301	Andrews	Dec. 24, 1940
2,247,618	Moroney	July 1, 1941