July 7, 1942. P. ZALKIND 2,289,281

COLLAPSIBLE CASING-FRICTION REDUCING DEVICE

Original Filed Oct. 19, 1935

Fig: 1

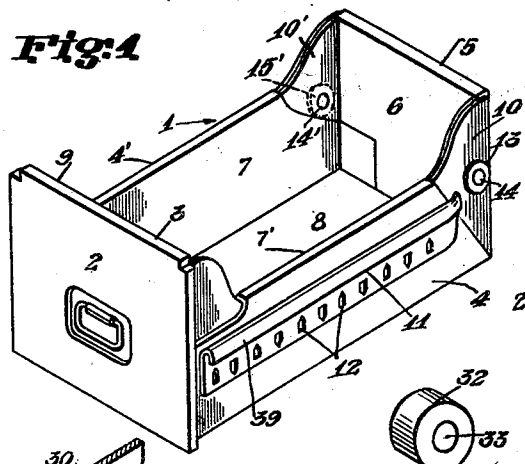


Fig: 3

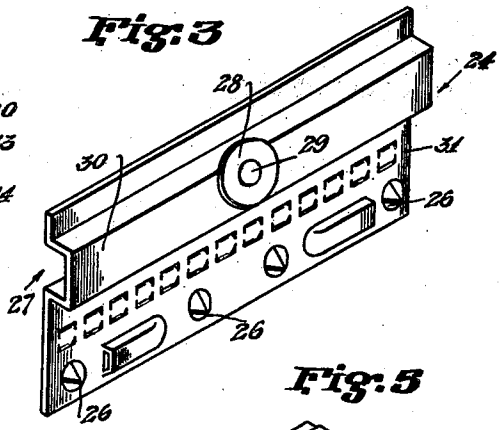


Fig: 7

Fig: 5

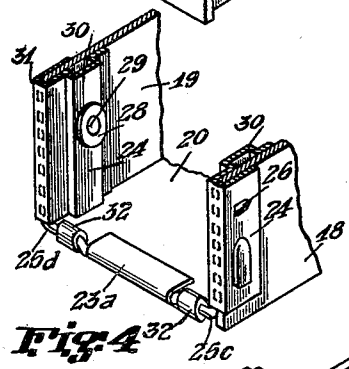


Fig: 4

Fig: 6

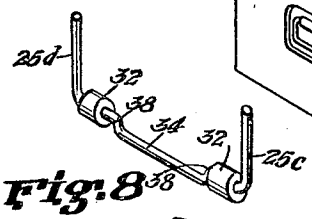
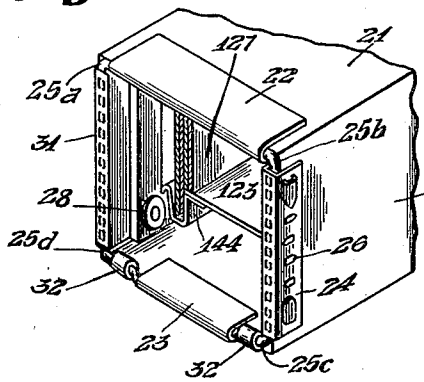
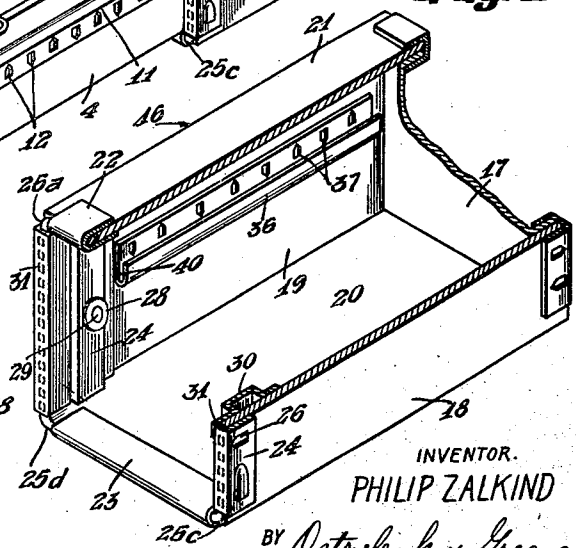


Fig: 8

Fig: 2





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UNITED STATES PATENT OFFICE

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COLLAPSIBLE CASING-FRICTION REDUCING DEVICE

Philip Zalkind, New York, N. Y.

Original application October 19, 1935, Serial No. 45,715. Divided and this application September 29, 1939, Serial No. 297,029

3 Claims. (Cl. 45—2)

My invention is a true division of application Serial No. 45,715, filed October 19, 1935, which matured into Patent Number 2,200,319, issued May 14, 1940, and relates to collapsible and/or folding containers; and more particularly to novel construction of drawers and the like of this class and novel construction of the parts with which said drawers and the like coact to facilitate movement of said drawer relative to said coacting parts.

In the movement of the drawers in and out, of the container in which the drawer is adapted to operate, it is desirable that as much freedom of movement as possible shall be obtained. The patent application of which this is a division was a continuation in part of my copending application Serial No. 693,841 filed October 16, 1935 in which I have shown novel construction for facilitating the movement of a drawer in a collapsible casing, and of my copending application Serial No. 739,962 filed August 15, 1934, in which I have shown novel construction for facilitating the movement of a drawer in a folding or collapsible cabinet.

In the aforesaid applications, I have shown a substantially flat bottom drawer of fibrous sheet material with novel wheel and track construction. This construction is generally very efficacious in reducing the friction between the drawer and the container, but I have found that with certain drawer loadings, the drawer bottom will sag or bow an amount to permit the drawer bottom to make contact with the bottom of the casing unless the wheels and tracks or rails are so mounted as to hold the drawer some distance above the bottom of the subjacent part. If the drawer bottom should sag under loading a sufficient amount to come into contact with the subjacent part, the full benefit of my anti-friction mounting cannot be obtained.

I have found that where it is expected to load the drawer in such a manner that, without a special construction, the drawer would rub on the subjacent part when loaded, I may provide means in the construction to eliminate such action.

Moreover, I have found that I may combine various parts of the anti-friction member with reinforcing or connecting members and thus obtain an economy of construction through such combination of parts. I have also found that other economies of construction may be attained through certain novel rearrangement of parts which expedite the manufacture of my novel construction.

Accordingly, objects of my invention are to provide novel apparatus for and methods of moving drawers into and from its container on wheels or rollers; novel apparatus for and methods of mounting collapsible drawers to be moved on wheels or rollers from and into a collapsible container; tracks secured to the container and/or to the drawer and rollers or wheels cooperating with said tracks for providing a maximum freedom of movement of the drawer with respect to its container; novel drawer construction to reduce sagging of the drawer bottom upon the subjacent part; tracks combined with reinforcing and/or connecting members; improved construction as affecting manufacture.

There are other objects of my invention which together with the foregoing will appear in the detailed description following in connection with the drawing, in which:

Figure 1 is a perspective view showing a drawer having wheel and track suspending means.

Figure 2 is a perspective view partly broken away showing a casing for enclosing the drawer of Figure 1, and provided with tracks and wheels for cooperating with coacting parts on the drawer of Figure 1.

Figure 3 is a perspective view showing a method of mounting a drawer supporting wheel upon the vertical open front end reinforcements of the casing.

Figure 4 is a perspective view partly broken away showing a modification of Figure 2 in which wheels are provided in the lower horizontal open front end reinforcement of the casing.

Figure 5 is a perspective view, partly broken away, showing the manner in which the drawer of Figure 1 may be mounted in the casing of Figure 2 or Figure 4.

Figure 6 is a perspective view showing a method for mounting the wheels of Figure 4.

Figure 7 is an enlarged perspective view showing one of the wheels of Figure 6.

Figure 8 is a partial view in perspective showing a modified arrangement at the front of the casing and a corresponding arrangement of the drawer.

In Figure 1, I have shown a form of folding drawer described in detail in my copending application Ser. No. 693,841 which has already been referred to. In this figure, the drawer 1 comprises the front wall 2, the inner front wall 3, the side walls 4 and 4', the rear wall 5, the inner rear wall 6, the side wall flaps 7 and 7', and the bottom panel 8, together with front wall flaps 9, rear wall flaps 10 and 10', and tabs ex-

tending from each end of both of the side wall flaps. This drawer may be folded from a single blank of sheet material and after folding is held in assembled position by means of the various flaps and tabs as described in my Patent No. 1,946,516.

On each of the side walls is mounted the track members 11 (see Fig. 5) of metal or other rigid material formed with the prongs 12 which are pierced into the outer side wall and clinched thereto, which securely fastens the track member to the drawer blank. The wheel 13 is mounted on the flap 10 extending from the rear wall 5, by means of the rivet 14. It will be understood that a similar wheel (not shown) is similarly mounted on the flap 10' and attached by the rivet 14' extending through the washer 15'.

The drawer 1 may be used with the casing 16 as shown in Figure 5, the casing being illustrated in further detail in Figure 2, and in a modified form in Figure 4. The casing as shown is of a type disclosed in my copending application Serial No. 693,841, but my invention is not limited to any particular form of casing. This casing comprises the rear wall 17, the side walls 18 and 19, the bottom wall 20, and the top wall 21. The open front end of the casing is provided with the horizontal reinforcing channels 22 and 23, and the vertical reinforcing members 24, one of the latter being shown in greater detail in Figure 3. At each corner of the open front end is a right angle bent member illustrated at 25*a*, 25*b*, 25*c* and 25*d*, connecting the vertical and horizontal reinforcing members.

The casing 16 is of the collapsible type and in its collapsed position, the vertical reinforcing members which are attached to the outside of the open front end in any suitable manner, as for instance by the prongs 26, are in the substantially flat position illustrated in Figure 3. In this position that portion of the vertical reinforcing member indicated at 27 projects out from the open front edge. This projecting portion may include the wheel 28 mounted on the reinforcing member by means of the axle rivet 29, as well as the rabbet 30. Member 24 is provided with the bend line 31, which is preferably of a type as disclosed in my copending application entitled Predetermined bend line, Ser. No. 45,710 and filed October 19, 1935. Also in the collapsed position of the casing, the angle members 25*a* and 25*b* which are held within the top horizontal channel 22 are turned outwardly to be substantially in the plane of the top panel 21; and the angle members 25*c* and 25*d* which are held within the bottom horizontal channel 23 are turned outwardly to be substantially in the plane of the bottom member.

In seting up the casing to its assembled position, the collapsed form is first turned on its bend lines until the open front assumes a rectangular position; the angle members 25 are then turned on their pivot to abut the front edges of the side walls; and the vertical reinforcing members 24 are turned on their score lines 31 to envelope the exposed legs of the angle members 24 and the vertical front edges of the side walls 18 and 19. In this position, the wheels 28 extend within the casing in a position to cooperate with the tracks 11 and 11' of the drawer. It will be understood that the tracks may be placed at any height on the drawer sides, provided the wheels 28 are properly positioned on the casing; but the wheels 28 should be placed in such a position on the casing 16 that when the drawer is hung within the casing by the tracks 11 and 11' coacting with the wheels 28, the bottom 8 of the drawer will not be in contact with the bottom 20 of the casing.

Mounted on the inside of the side wall 19 of the casing 16 may be a rail member 36 attached to the wall by any suitable means, such as the prongs 37. A similar rail, not shown, may be attached to the side wall 18 in a similar manner. The rails 36 are placed at a height within the casing to cooperate with the wheels 13 mounted on the drawer. The relative position of the wheels 13 and the rails 36 is such that when the wheels 13 are supported by the rails 36, the drawer will be free to move within the casing without the drawer bottom 8 coming in contact with the casing bottom 20.

As shown in Figure 4, and in further detail in Figure 6, the bottom corner angles 25*c* and 25*d* may be provided with wheels 32. The angles 25*c* and 25*d* may be united with each other in a uniting structure through the rod 34 which is preferably connected with the angle members through the offsets 38. The angle members are then joined to the casing bottom by means of the rod 34 secured in place by the bottom reinforcing member 23*a*.

The offsets 38 serve a double purpose in connection with the wheels 33. When the casing is in a collapsed position and the angle members 25*c* and 25*d* lie substantially in the plane of the bottom member 20, the offsets serve to bring the wheels 33 outside of the casing and into a position where they do not interfere with collapsibility. When the casing is asembled, the offsets serve to raise the wheels 33 relative to the casing bottom 20. By proper proportioning the wheels and the offsets, the bottom of the wheels can be raised a sufficient amount, that they will lie slightly above the casing bottom and will not interfere with the casings being laid upon a substantially flat surface or being piled one upon the other. In this position the wheels 33 will cooperate with the bottom of the drawer when the drawer is inserted into the casing, or they may be cooperated with suitably flanged reinforcements on the drawer bottom as will be more fully described later.

As has been described, I have shown three sets of coperating means for reducing the friction of the drawer in the casing. These means are:

1. Wheels on casing coacting with tracks on the drawer member.
2. Wheels on the drawer coacting with rails on the casing member.
3. Wheels on the open front end coacting with a portion of the drawer bottom.

It will readily be understood that, while these three sets of means may cooperate with each other in the manner that will shortly be described, any one of the sets or a combination of any two of the sets will greatly reduce the friction of the drawer in the casing and depending upon the particular application I may apply one or another of the friction reducing means, without the application of the other groups. Moreover, with properly positioning of the tracks 11 and 11' and the rails 36, it may in certain instances be desirable to entirely eliminate the wheels 13, 28 and 32 and mount the drawer in the casing by hanging the drawer in the casing through the medium of the tracks 11 and the rails 36, the downwardly depending leg 39 of the track 11 being supported within the channel 40 of the rail 36. This will raise the bottom of the drawer above the bottom of the casing and will

greatly reduce the friction of the drawer in the casing.

Where all three sets of wheels and their coacting members, which have been described, are provided, these three sets cooperate with each other as follows: The principal supporting and anti-friction means comprises the wheels 28 coacting with the tracks 11 and 11'. The wheels and their axles act as pivots about which the drawer is free to rotate. Thus, when the drawer is first inserted into the casing, the weight of the drawer is largely on the outside of the casing, so that the center of gravity of the drawer will lie outside of the pivots 29 as clearly shown in Figure 5. This would cause the forward end of the drawer to move downwardly about the wheels 28 so that the bottom of the drawer will come in contact with the bottom edge of the open front end of the casing, unless the front end of the drawer is manually supported. Such manual support may require a considerable effort when the drawer is heavily loaded, and it becomes largely unnecessary where the wheels 32 are provided, as these wheels then take the load off the front end of the drawer, but do not cause an increase in friction as would be occasioned by the drawer bottom rubbing over the bottom open end of the casing.

As the drawer is pushed into the casing, the center of gravity of the drawer continuously moves closer to the pivots 29, until such a position is reached that the center of gravity of the drawer lies in a vertical plane through the pivots 29. Any further movement of the drawer then causes the center of gravity of the drawer to pass into the casing beyond the pivots, which in turn act to cause the rear end of the drawer to drop relative to the casing, and if the drawer were not otherwise supported, the rear bottom edge of the drawer would rub on the inside bottom of the casing. If wheels 13 and tracks 36 are not provided, this rubbing may be disposed of by manually supporting the drawer by pulling down on the front of the drawer, but if wheel 13 and 13' and tracks 36 are provided, these means will prevent the drawer bottom from coming into contact with the casing and will provide anti-friction support for the rear end of the drawer.

The drawer bottom may be reinforced to cooperate with rollers 32 or as is seen in Figure 8, it may be raised and reinforcements or flat bearing strips or members of metal or other suitable material may be applied thereto in the manner disclosed in my parent application aforementioned for the purpose of providing a suitable bearing surface.

Many modifications and variations of the type of construction herein shown will now be obvious. I prefer therefore to be limited not by the specific disclosures herein but only by the appended claims.

I claim:

1. A collapsible casing for a file cabinet or the like, said casing having an open front end and comprising a bottom wall; side walls; a top wall; said walls being made of sheet material hingedly interconnected along corner edges between side, top and bottom walls; adjacent walls being movable angularly relative to each other about said hinged connections to permit the casing to be shipped in knock-down condition; horizontal and vertical reinforcing members at the wall portions forming said open ends; a joining member for connecting said horizontal and vertical reinforcing members to maintain the casing in erected position; said joining member comprising an angle wire rotatably secured at the open end of the bottom wall of said casing and engageable with an adjacent vertical reinforcement; and a wheel mounted on said joining member and adapted to provide a friction reducing glide for a drawer in said casing.

2. A collapsible casing for a file cabinet or the like, said casing having an open front end and comprising a bottom wall; side walls; a top wall; said walls being made of sheet material hingedly interconnected along corner edges between side, top and bottom walls; adjacent walls being movable angularly relative to each other about said hinged connections to permit the casing to be shipped in knock-down condition; horizontal and vertical reinforcing members at the wall portions forming said open end; a joining member for connecting said horizontal and vertical reinforcing members to maintain the casing in erected position; said joining member comprising an angle wire rotatably secured at the open end of the bottom wall of said casing and engageable with an adjacent vertical reinforcement, said angle wire having an off-set portion along its horizontal leg; and a wheel mounted on said off set portion and providing a friction reducing glide for a drawer in said casing.

3. A collapsible casing for a file cabinet or the like, said casing having an open front end and comprising a bottom wall; side walls; a top wall; said walls being made of sheet material hingedly interconnected along corner edges between side, top and bottom walls; adjacent walls being movable angularly relative to each other about said hinged connections to permit the casing to be shipped in knockdown condition; horizontal and vertical reinforcing members at the wall portions forming said open end; a joining member for connecting said horizontal and vertical reinforcing members to maintain the casing in erected position; and a wheel mounted on said joining member and adapted to provide a friction reducing glide for a drawer in said casing; and said joining member being bent at the mounting of the wheel whereby said wheel projects outside of said casing when said casing is collapsed and within the open end thereof when said casing is erected.

PHILIP ZALKIND.