Jan. 24, 1933. M. R. MORTON 1,895,229

SWEEPING BROOM AND HANDLE CONNECTION THEREFOR

Filed June 1, 1931

Fig. 1.

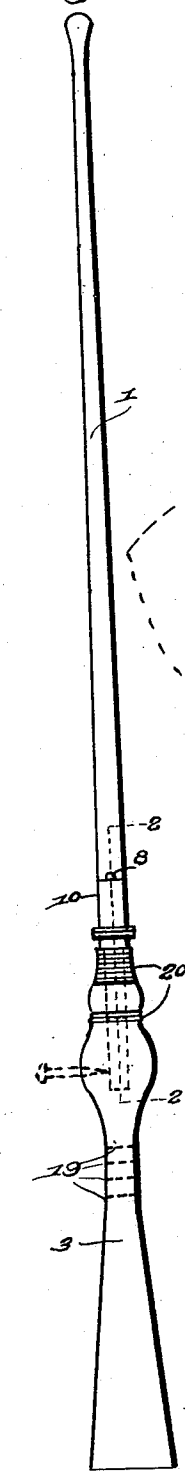


Fig. 2.

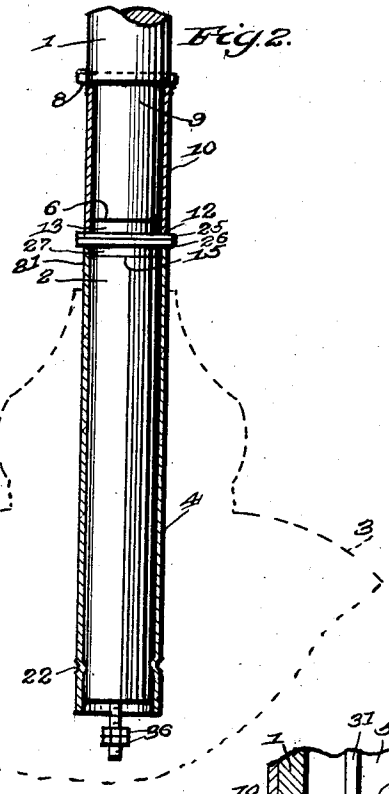


Fig. 3.

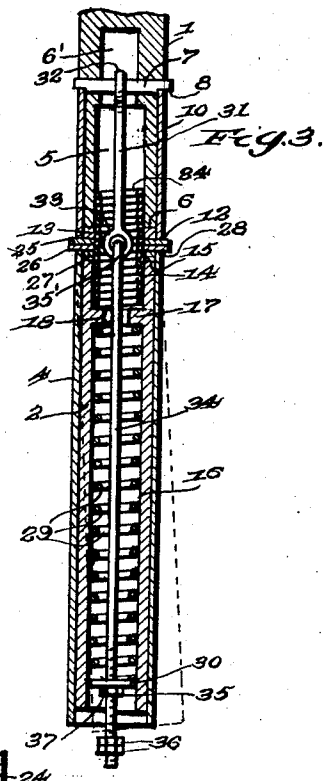


Fig. 6.

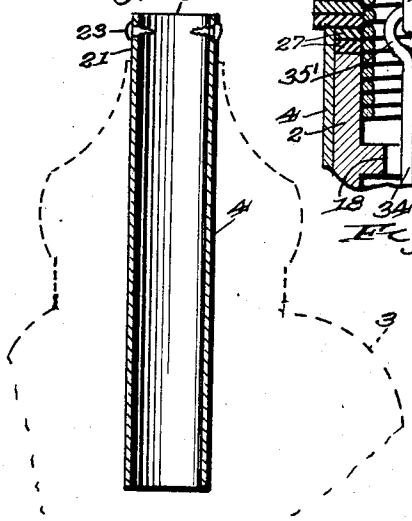


Fig. 7.

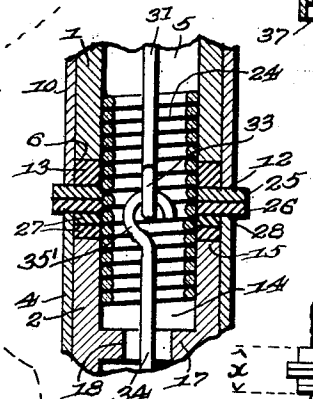


Fig. 4.

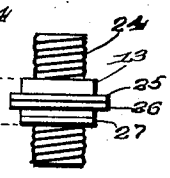
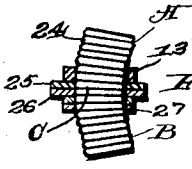


Fig. 5.



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UNITED STATES PATENT OFFICE

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SWEEPING BROOM AND HANDLE CONNECTION THEREFOR

Application filed June 1, 1931. Serial No. 541,361.

The object of this invention is to provide an improved sweeping broom structure and article therefor, and the invention is an improvement on my U. S. Patent No. 1,674,983, issued June 26, 1928.

A feature of this invention consists in building a broom body onto a sleeve, and in permanently or removably securing the handle in said sleeve.

My invention also resides, as an article of manufacture, in a broom body built upon a hollow member or sleeve.

A further object of the invention is to provide a flexible broom handle that is adjustable to vary the tension on the flexible handle, such adjustment being effected by relatively turning the flexibly connected portions of the broom structure without dis-assembling the same.

A further feature consists in a novel spring construction and mounting normally acting to maintain the handle sections in alined and flush relation and wherein the spring is located and disposed in such a manner that the flexing stress will be sustained by a plurality of the convolutions of the spring.

The invention has many other features and objects which will be more fully described in connection with the accompanying drawing and which will be more particularly pointed out in and by the appended claims.

In the drawing:—

Fig. 1 is a view in edge elevation of a broom structure equipped with the preferred form of my invention.

Fig. 2 is a sectional view on an enlarged scale taken on line 2—2 of Fig. 1, and showing the broom body in dotted lines and internal portions of the handle in elevation.

Fig. 3 is a sectional view taken on the same sectional line and showing all the parts in section.

Fig. 4 is a detached view of the hinging spring and washers.

Fig. 5 is another view of the hinging spring flexed to illustrate how the parts would act when the broom handle is flexed.

Fig. 6 is a view of the broom body, showing the latter in dotted lines and illustrating in section, the sleeve on which the body is built up.

Fig. 7 is an enlarged sectional view of the juncturing portions of the handle and broom sections.

Like characters of reference designate similar parts throughout the different figures of the drawing.

I will first generally designate the main integers of the invention to broadly locate the various parts in the reader's mind before entering into a detailed description.

The handle is composed of handle and broom sections 1 and 2, and the broom body 3, which is shown as the usual type that is made of broom straw, and is built upon a broom sleeve 4. What I will term the juncturing end of the handle section 1 is axially bored at 5, to form a hollow end and the terminal 6, thereof, is clearly shown in Fig. 3. The bore 5, may be reduced at 6′ to afford an increase of stock, and a cross pin 7, is inserted through section 1, as shown, and the lower portions of the outer ends of said pin 7, are preferably reduced at 8, to form shoulders, and said ends slightly project from diametrical peripheral points of section 1. Said section 1, is preferably reduced at 9 and a stress and pin sustaining ferrule 10 is sleeved over said reduced end and the upper edge portions of said ferrule 10 engage the shouldered portions 8 of said pin 7 which serves not only to prevent said pin 7 from working endwise but also takes the thrust imposed on said pin 7 by the main restoring spring, to be later described, and prevents the pin 7 from disrupting the wood or other material of which the handle section 1 is made. The lower edge 12, of said ferrule 10, projects beyond terminal 6, thereby forming a recess which I fill with non-metallic and slightly flexible filling and spring protecting washers or a single washer 13. It will thus be seen that terminal 6, of handle section 1, is clearly in recessed relation with respect to the projecting edge 12, the purpose of which will later appear.

Reference will next be made to the broom section and to its relation to the handle section.

The broom section 2, which like the handle section 1, is usually made of wood, is shown bored at 14, to form a hollow or socket end and the juncturing terminal is indicated at 15. The remaining, and in the disposition shown, the lower portion of section 2 is bored at 16 throughout the remainder of its length, the bores 14 and 16 being divided from each other by an abutment 17 having an opening 18, the abutment 17 serving for one end of a major spring to be presently described.

Reference will next be made to the broom body and broom sleeve.

The sleeve 4, is preferably of metal and of sufficient length to permit of the broom body being built thereupon. I have shown the body 3, as of the usual form, the straw being sewed at 19, and the neck being wired, as at 20, to the sleeve 4, and the latter extending down into the body as shown by dotted lines in Fig. 1. The disposition is such that the normally upper portion 21, of sleeve 4, projects slightly above the neck of the body 3.

It will now be clear that this broom body and sleeve may, and in actual practice will, constitute an article of manufacture separate from the handle, and may be made and sold separately, under some trade conditions, and hence, I consider and claim this structure as a patentable article of manufacture. It will be noted that this article is self stable and self contained.

In the structure shown, the broom body is attached to the handle structure by telescoping the sleeve 4 over the broom section 2, as shown in Fig. 2. It is advantageous to secure the broom body to the section 2 so that they will not only be non-rotatively connected but so that the broom body cannot slip or work off from section 2. One means of anchorage may consist in applying a punch through the broom straw, as indicated in Fig. 1, after the parts are assembled, so that the metal of sleeve 4 can be indented into the wood, as indicated at 22. This expedient may be used where it is desired to permanently affix the broom body to section 2, when the broom body is sold with the handle and not sold separately. Where it is desired to sell the broom body separate from the handle, the anchorage may be effected by providing the upper end 21 of sleeve 4, with suitable apertures and inserting short wood screws 23 therethrough and into the stock of section 2. Thus, after the broom body is worn out, it may be detached from the handle by out-turning screws 23. and a new broom body may be purchased and secured to the handle that was originally purchased with the broom body. However, in any event, and with either form, the broom body is non-rotatively secured to section 2, the importance of which will later appear.

Reference will next be made to the manner in which the handle and broom sections are hinged in end to end relation and maintained in peripheral flush relation.

My improved hinge consists of a coil spring 24 in which the convolutions are in lateral abutting relation, as shown in Fig. 4. This spring 24 has its ends inserted into the bores 5 and 14, of sections 1 and 2 and extends across the juncture of said sections. Bearing washers, preferably two, indicated at 25 and 26, are snugly fitted on spring 24 and are disposed between the edges of ferrule 10 and sleeve 4, and said washers extend radially slightly beyond the peripheries of said parts as shown in Fig. 3, to insure a bearing engagement when the sections are flexed, as shown in dotted lines in said figure. These washers 25 and 26, will preferably be made of fiber or a like efficient wearing material. Above washer 25, is disposed a filling or spring protecting washer 13, hereinbefore referred to, and one or more filling washers 27, are disposed below washer 26, to fill the recess between the terminal 15 and the upper projecting edge 28, of sleeve 4. The washers 13 and 27 will likewise be of fiber or like efficient wearing material and are capable of yielding to a slight extent.

It will now be clear that spring 24 normally acts to restore the sections 1 and 2 to alined relation as said spring fits snugly in the hollow ends thereof, and further, said spring also, and primarily acts to maintain said sections in peripheral flush relation. The total length of the washers along the spring 24, which may be termed the bearing dimension, is indicated at x in Fig. 4. Consequently, throughout this washer length, there is a slightly yielding action responsive to bending moment of the spring 24, and because the convolutions of the spring 24 are in abutting relation, a plurality of convolutions would be abreast of said washers and thereby engaging yielding material.

Therefore, the bending stress is not sustained by one or two convolutions but by a series thereof throughout the height indicated by x and hence the spring will not be strained when the sections are flexed, and this novel feature results from the combination of the yielding washers forming a yielding sleeve for a length about the spring, and also the fact that the convolutions of the spring are in abutting relation. Above and below the washers 13 and 27, the spring is un-yieldingly engaged by the bores of sections 1 and 2. The action of the spring is clearly illustrated in Fig. 5, where it will be seen that end portions A and B are straight, while the central portion C is curved.

Reference will next be made to the means of a primary nature, for restoring the sections 1 and 2 to alined relation, and which acts longitudinally of said sections in the performance of its function.

A restoring spring is indicated at 29, and is disposed in section 2, and in practice, I use a spring capable of sustaining a load of about one hundred and forty pounds to the linear inch. One end, or in this disposition, the upper end of said spring, coacts with abutment 17. A washer abutment 30, engages the remaining end of spring 29, I employ what I will term a tension rod, and to the extent that said rod is jointed, it is a flexible rod, and in the form shown, one section of said rod, as indicated at 31, is disposed in bore 5 and has an eye 32 which is disposed about pin 7, to non-rotatively connect the rod with said pin. The remaining end of said rod has an eye 33 which is disposed abreast of the washers 25 and 26, at which plane the sections 1 and 2 break joint or flex. The remaining section of said rod is indicated at 34 and has a hook 35′ that is detachably and non-rotatively connected with eye 33.

Section 34 extends through bore 18 and through spring 29 and washer abutment 30 and has a lower threaded end portion although there is no threaded connection with the abutment washer 30, the latter being free on said section 34. A nut 35 is threaded on section 34 and engaged washer 30. The lower end of section 34 may be provided with lock nuts 36, the purpose of which will presently appear. Because of the liability of rust, from dampness, preventing the nut 35 from turning on section 34, I preferably pin or otherwise non-rotatively connect said nut 35 with said washer 30, as indicated at 37. It will be noted that the clearance afforded the linked or flexible tension rod just described, through spring 24 and the bores of the handle and broom sections, is amply sufficient for any flexure that would be practical, and that flexure of the handle and broom sections can take place in any direction from the longitudinal axis of the handle structure.

I now wish to emphasize a most important feature of the invention, namely, that because of the non-rotative connection of the broom body 3, with the broom section 2, and by reason of the non-rotative connection of the tension link with pin 7, that relative turning movement of the handle section 1, with respect to the broom body 3, in either direction, will serve either to increase or decrease the tension of the primary restoring spring 29, dependent upon the direction in which the parts are adjustably turned. The friction of spring 29, against washer 30, will prevent the latter from turning, and as the tension rod is turned by pin 7, it will be clear that nut 35 will be advanced upwardly or downwardly thereby varying the tension on spring 29. It will also be clear that this adjustment of tension is easily effected without dis-assembling the broom structure.

The lock nuts 36, are positioned in a manner to prevent the user from adjusting the nut 35 to decrease the spring tension, beyond a predetermined extent, as it will be understood that to decrease the tension of spring 29, the swivelled parts 1 and 2 are relatively turned to advance nut 35 toward nuts 36, the reverse being true to increase the tension. Therefore, there is absolute freedom and latitude for either increasing or decreasing tension, and the user can try the broom to determine when the desired tension has been obtained.

If the broom body 3 is detachably secured to the handle, and the tension is released, it will be clear that the hook 35′ may readily be detached from the eye 33, and the parts dis-assembled if necessary.

It will be seen that the washers 13, 25, 26 and 27, form a yielding sleeve which is of sufficient length so that irrespective of whether the convolutions of spring 24 are in actual abutting relation, flexing stress imposed by flexure of the handle and broom sections, will be sustained by a plurality of convolutions of said spring thereby rendering said spring more efficient in the performance of its restoring function. It will further be clear that in addition to this function, the wearing washers 25 and 26, perform the additional function of taking the wear off the ends of sleeve 4 and ferrule 10 and affording the latter a base on which to flex. It will also be clear that the two wearing washers 25 and 26 form a swivelling juncture between sleeve 4 and ferrule 10 thereby permitting easily relative rotation or rotative adjustment of the handle and broom sections.

It will be clear that as the ferrule 10 projects beyond the hollow end of the handle section 1, and as the broom sleeve 4 projects beyond the hollow broom section 2, that the resulting structure presents handle and broom sections having hollow shouldered ends. The flexible sleeve or tube formed by the washers, abuts against shoulders 6 and 15 in endwise relation, internally of the sleeve 4 and ferrule 10, and the projecting portion of the flexible tube or sleeve formed by the washers 25 and 26, constitutes not only a swivelling juncture but a fulcruming projection of the flexible tube.

It is believed that the invention will be fully understood from the foregoing description, and while I have herein shown and described one specific form of the invention, I do not wish to be limited thereto except for such limitations as the claims may impart.

I claim:—

1. In a flexible broom structure, handle and broom sections provided with hollow ends, a ferrule outwardly telescoping said handle section and projecting beyond one end thereof to form a recess, a spring sleeved in said hollow ends and flexibly connecting said sections, a broom sleeve outwardly telescoping said broom section and projecting beyond

one end of the latter to form a recess, wearing washers surrounding said spring and interposed between the adjacent ends of said ferrule and sleeve and projecting peripherally beyond the same, and filling washers surrounding said spring and disposed in the recesses formed in the ends of said handle and broom sections and forming with said wearing washers a sleeve extending along a plurality of convolutions of said spring at the flexing juncture of said sections.

2. In a flexible broom handle, handle and broom sections having hollow ends provided with recesses and adapted to be disposed in endwise abutting relation, a coiled spring having abutting convolutions and disposed in said hollow ends and extending across the juncture thereof and normally acting to maintain said sections in alined and flush relation, and bearing washers interposed between the juncture of said sections and spring protecting washers in the recesses thereof to yieldingly sleeve a plurality of convolutions of said spring along the flexing juncture of said sections.

3. In a flexible broom handle, handle and broom sections adapted to be disposed in alined relation to form a handle, a ferrule on said handle section projecting beyond the juncturing end of said section and forming a recess, a yielding filling washer substantially filling said recess, a sleeve on said broom section projecting beyond the juncturing end of said section and forming a recess, a yielding filling washer substantially filling said recess, yielding wearing washers interposed between the juncturing ends of said ferrule and sleeve and projecting radially beyond the peripheries of the latter, said sections having hollow ends, and a coiled spring extending through all of said washers and into the hollow ends of said sections and normally acting to maintain said sections in alined and flush relation.

4. In a flexible broom handle structure, handle and broom sections having hollow portions, a spring having an abutment in one of said sections, a cross pin in the other of said sections having a link connected with said spring to compress the latter and normally hold said sections in alined relation, and a ferrule on said cross pin section with one end of said ferrule engaging the ends of said cross pin to take the stress from the latter and the remaining end of said ferrule transmitting the thrust endwise against the end of the remaining section.

5. In a flexible broom handle structure, handle and broom sections having hollow ends, a coil spring having relatively closely disposed convolutions and having its end portions disposed in said hollow ends of said sections and extending across the juncture thereof and normally acting to maintain said sections in alined relation, and a sleeve-like tube of yielding material outwardly telescoping said spring across the juncture of and disposed in endwise abutting relation against the hollow ends of said sections and extending along a series of convolutions of said spring whereby flexing stress will be sustained by a plurality of convolutions of said spring.

6. In a flexible broom handle structure, handle and broom sections having hollow ends provided with shoulders internally thereof, a coil spring having its end portions disposed in the hollow ends of said sections and normally acting to maintain said sections in alinement, and a sleeve-like tube of yielding material outwardly telescoping said spring and extending across the terminals of said hollow ends of said sections and extending along a plurality of convolutions of said spring whereby flexing stress will be sustained by a plurality of convolutions thereof, the ends of said tube abutting against said shoulders, and said tube having an annular projecting portion forming a fulcruming and wearing juncture for the terminal ends of said sections.

In witness whereof, I have hereunto set my hand.

MARCUS R. MORTON.