Feb. 24, 1948. B. THIELE 2,436,460

WHEEL MOUNT FOR CARPET SWEEPERS

Filed Aug. 1, 1941 2 Sheets-Sheet 1

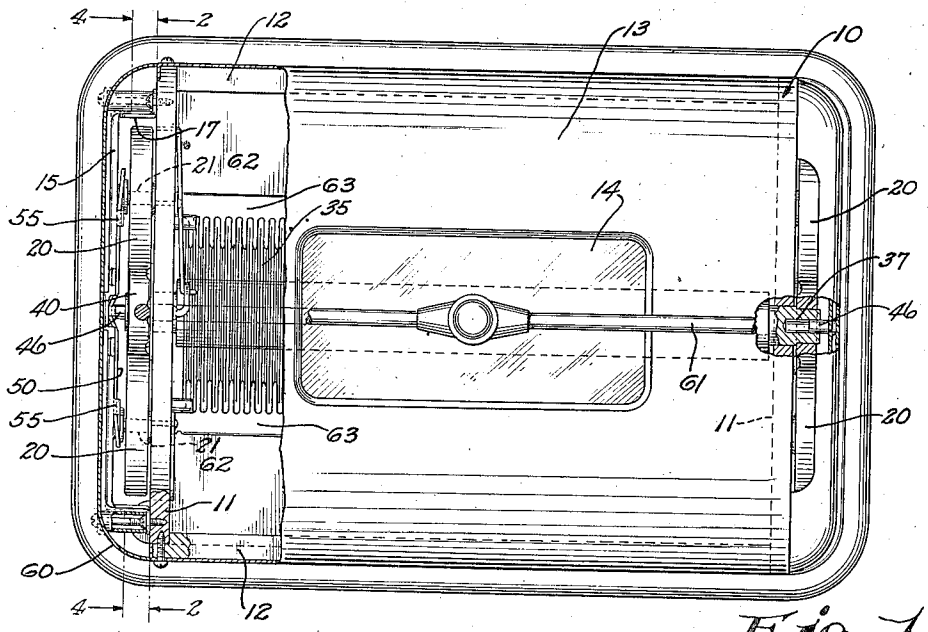


Fig. 1.

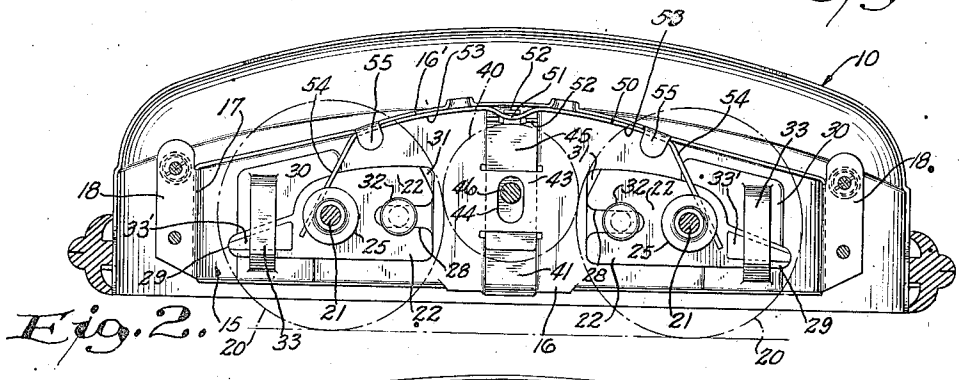


Fig. 2.

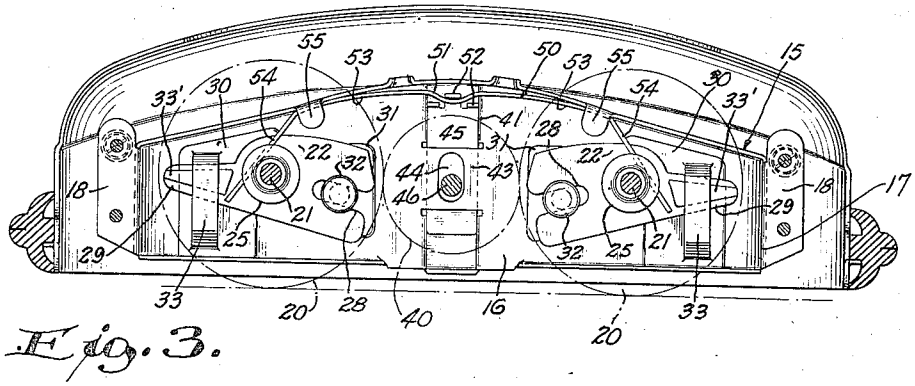


Fig. 3.

INVENTOR.
BERTHOLD THIELE.

BY John W. Michael

ATTORNEY.

Feb. 24, 1948. B. THIELE 2,436,460

WHEEL MOUNT FOR CARPET SWEEPERS

Filed Aug. 1, 1941 2 Sheets-Sheet 2

Fig. 4.

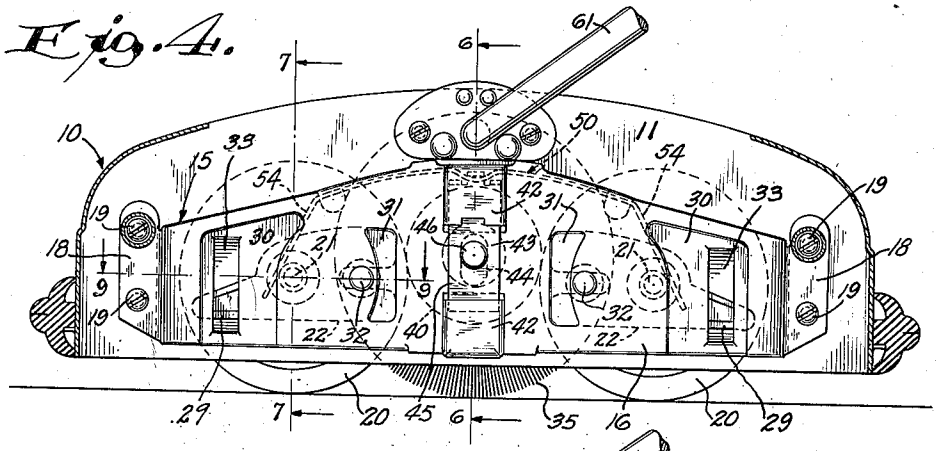


Fig. 5.

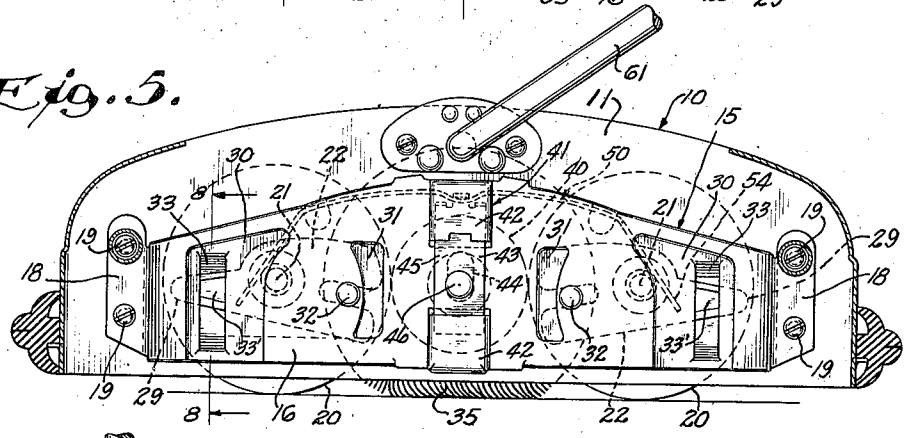


Fig. 6.

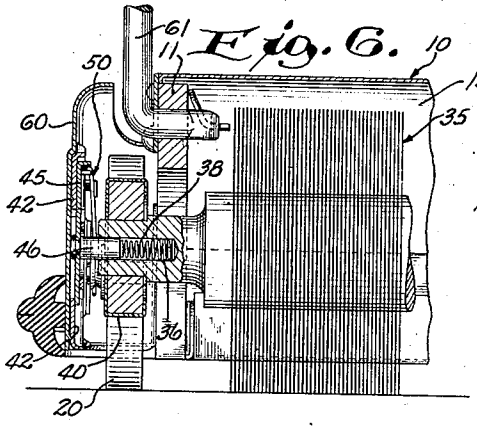
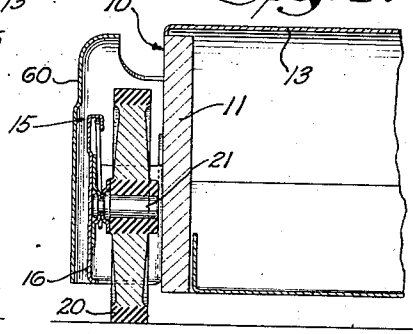


Fig. 7.



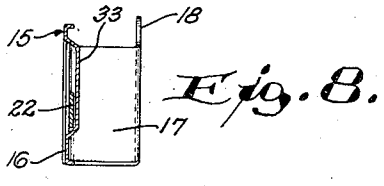


Fig. 8.

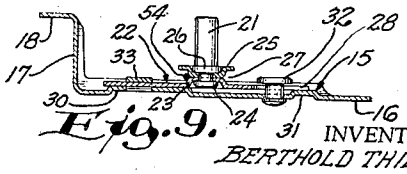


Fig. 9.

INVENTOR.
BERTHOLD THIELE.

BY John W. Michael

ATTORNEY.

Patented Feb. 24, 1948

2,436,460

UNITED STATES PATENT OFFICE

2,436,460

WHEEL MOUNT FOR CARPET SWEEPERS

Berthold Thiele, Milwaukee, Wis., assignor to E. R. Wagner Manufacturing Company, Milwaukee, Wis., a corporation of Wisconsin

Application August 1, 1941, Serial No. 405,003

5 Claims. (Cl. 15—48)

1

This invention relates to an improvement in carpet sweepers, and more particularly to an improved way of mounting and combining the floor wheels and the rotary brush so that the brush automatically takes the most effective position for sweeping the rug or carpet over which it is propelled.

In a conventional type carpet sweeper the brush is mounted high enough for the thickest carpet. By exerting pressure on the handle the sweeper case and with it the brush is brought to the proper sweeping level, which the operator has to "feel" and maintain for each individual carpet to assure effective sweeping. That means that on a thin pile carpet much more pressure must be applied to the handle of the sweeper than on a thick pile carpet.

In the present invention the brush moves downwardly about twice as fast as the case when pressure is applied to the handle. In other words, only about half the pressure and half the downward movement of the case are required to bring the sweeper to the proper sweeping level compared with the conventional type sweeper. This makes the sweeper much more sensitive. In most cases, the pressure on the handle, required to overcome the resistance which the carpet presents to the travel of the sweeper, is enough to bring the sweeper to the proper sweeping level. The present invention provides for this desirable action in a highly simplified construction and one in which the brush is flexibly or yieldably mounted.

One of the objects of the invention is to provide a carpet sweeper of this character and having these advantages, and which is simple, compact, and closely organized in structure, reliable, efficient, and noiseless in operation, susceptible to easy and convenient manipulation, and adapted to be manufactured with economy from materials and by means of facilities readily available.

Other objects and advantages reside in certain novel features of the construction, arrangement, and combination of parts, which will be hereinafter more fully described and particularly pointed out in the appended claims, reference being had to the accompanying drawings forming a part of this specification, and in which:

Figure 1 is a view in top plan illustrating a carpet sweeper embodying the present invention, parts being broken away and parts being shown in horizontal cross section for the sake of illustration;

Figure 2 is a view in longitudinal, vertical, cross section, taken on line 2—2 of Figure 1, looking

2

in the direction of the arrows, and illustrating the brush in its normal or high position;

Figure 3 is a view similar to Figure 2, but showing the brush in its low position;

Figure 4 is a view in longitudinal, vertical cross section taken on line 4—4 of Figure 1 and looking in the direction of the arrows, and showing the brush in its normal or high position;

Figure 5 is a view similar to Figure 4 showing the brush in its low position;

Figure 6 is a fragmentary view in transverse, vertical cross section taken on line 6—6 of Figure 4, looking in the direction of the arrows, parts being shown in elevation for the sake of simplicity in illustration;

Figure 7 is a view in transverse, vertical cross section taken on line 7—7 of Figure 4 and looking in the direction of the arrows, parts being shown in elevation for the sake of simplicity in illustration;

Figure 8 is a fragmentary view in transverse, vertical cross section, taken on line 8—8 of Figure 5 and looking in the direction of the arrows; and

Figure 9 is a fragmentary view on an enlarged scale and in horizontal cross section, taken on line 9—9 of Figure 4, with parts shown in elevation for the sake of simplicity in illustration.

Referring to the drawings, the numeral 10 designates generally the main casing which may be constructed in any suitable manner, and for the sake of illustration is shown as made up of a pair of wooden end plates 11 cross-connected by side rails 12 to which they are fastened in any suitable manner. A curved metal casing member or top 13 provided with a window 14 completes the construction of the casing 10.

At each end of the casing, an end bracket designated generally at 15 is provided. The end brackets 15 are of identical construction and each is constituted of a sheet metal stamping including a body portion 16 having inturned ends 17 provided with attaching flanges 18 secured by screws or other suitable fastening devices 19 to the wooden end plates 11 of the main casing.

A pair of floor wheels 20 is provided at each end of the sweeper, the floor wheels being disposed between each wooden end plate 11 of the main casing and the adjacent end bracket 15. In carrying out the present invention it is essential that the floor wheels 20 be supported on floating axles, and while various types of floating axles may be employed it is particularly advantageous to utilize floating stub axles 21. There is one such stub axle 21 for each floor wheel 20, and each stub axle 21 has one end suitably secured, preferably

staked or riveted, to a supporting plate 22. For this purpose each plate 22 may have a recess or countersink 23 therein, the floor of the recess being provided with an opening through which one end of the stub axle 21 passes. The end of the stub axle which extends into the recess 23 is riveted or staked over within the recess, as indicated at 24 in Figure 9. This same riveting operation may also be employed to secure in proper position in the assembly a spring retaining washer 25, this being accomplished by providing a collar or shoulder 26 on the stub axle and clamping the washer between the shoulder 26 and the adjacent wall of the recess 23. By providing this structure an annular slot or channel 27 is defined which is adapted to receive a spring arm, as will hereinafter more clearly appear. Each supporting plate 22 is preferably of the shape shown to advantage in Figures 2 and 3 and has one end provided with a slot 28 and its opposite end provided with a reduced and tapered extension or tail 29.

The body portion of each end bracket is provided with bearing pads 30 and 31 for each axle supporting plate 22, these bearing pads being formed by pressing or inwardly offsetting appropriate areas of the body portion 16 of each end bracket 15. The purpose of the bearing pads is to reduce the frictional contact between the supporting plates 22 and the end brackets 15, thereby rendering the action smoother, easier, and noiseless.

The slotted end of each end bracket 22 is rockably and slidably fitted on a headed guide stud 32 riveted to the body portion of the end bracket, the slot 28 of each supporting plate straddling the shank of the headed stud, and the head of the stud 32 overlapping the margins of the slot. To constrain each supporting plate 22 to rocking and sliding movement on its headed guide stud 32, a guide strap 33 is provided and embraces the reduced end or tail 29 of each supporting plate 22. These guide straps 33 are preferably and advantageously provided by cutting vertical slots in the body portion 16 of each end bracket 15 adjacent its ends and offsetting inwardly the metal between these parallel vertical slots. To further reduce the friction between each supporting plate 22, and the structure on which it is mounted and by which it is guided, each reduced extension or tail 29 of each supporting plate may have a reduced area thereof pressed outwardly to provide a bearing pad 33 which has sliding and rocking contact with its cooperable guide strap.

A rotary brush 35 is provided and is formed at its ends with axial bearing sockets 36 and 37. In the socket 36, at least, a coil spring 38 is provided. If desired a spring 36 may also be provided in socket 37. The main portion of each spring 38 has an outside diameter less than the inside diameter of the socket, but the inner end portion thereof is slightly greater in diameter than the inside diameter of the socket 36 and is a force fit therein, thereby to retain the spring in position in its socket.

Friction pulleys 40 are fixed to the ends of the brush 35 and in the assembly are disposed in driving engagement with the floor wheels 20.

Each end bracket 15 is provided with a vertical central guideway, designated generally at 41. This guideway may be, and preferably is, constituted by transversely slotting spaced portions of the body portion of the end bracket 15 at the center thereof and pressing outwardly vertically

alined guide straps 42. The part of the body portion of each end bracket located between the guide straps 42, and designated at 43, remains in the mean plane of the body portion 16 of the end bracket 15, and is formed with a slightly elongated vertical slot 44. A slide 45 is fitted in each guideway 41 for vertical sliding movement, each slide spanning the intermediate portion 43 of its guideway and having portions, in all adjustments, engaged with guide straps 42. A brush axle stud 46 is riveted or otherwise suitably fixed to each slide 45 and projects through the adjacent slot 44 and into the adjacent bearing socket 36 or 37 of the brush 35.

It will be understood at this point that the spring 38 in the socket 36 centers the brush 35 on its axle studs 46, but may be compressed to facilitate assembly and disassembly of the brush with its axle studs. The axle studs 46 and the bearing sockets 36 and 37 illustrate one convenient way of providing journal connections between the ends of the brush 35 and their supporting slides 45.

The present invention proposes to so interconnect the floating axles of the floor wheels 20 and the vertical adjustable mountings 45 for the brush 35 that the sweeper automatically takes the proper sweeping level without requiring the operator to apply heavy or laborious pressure to the sweeper handle. A light and easy manipulation of the sweeper handle is all that is required.

For this purpose a single spring, designated generally at 50, is combined with each end bracket 15, is interengaged in a special way with the adjacent floor wheels 20, and is interconnected with the brush mounting slide 45 of the bracket 15 on which the spring 50 is supported. Each spring 50 may be advantageously made up of a bowed spring member of wire stock, preferably suitable spring steel. Each spring 50 has a central reversely curved portion 51 which is threaded through or fitted between laterally extending lugs 52 integral to the upper end of the slide 45 with which the spring is combined. Beyond the central portion 51 each spring is formed with intermediate curved portions 53, and beyond the curved portion 53 has downwardly extending spring arms 54. Each end bracket 15 has its body portion 16 provided with an inturned marginal flange formation 16' along its upper edge, and in the assembly the intermediate portions 53 of each spring 50 bear or fulcrum against specially constituted portions of these flanged formations 16'. The portions 53 of the spring which bear or fulcrum against the flanged formations are provided with a better bearing area and are held against lateral displacement by retaining lugs 55 integral with the flanged formations 16' and overlapping with the springs 50 in the manner shown in the drawing. The spring arms 54 have their lower portions received in the channels 27 of the stub axles 21 and press inwardly and downwardly on the stub axles 21. The springs 50 are strong enough to sustain the sweeper with the wheels 20 in their low position and the brush 35 in its high position when the sweeper is at rest. When the sweeper is propelled across the surface of a rug or carpet, the springs 50 yield and the supporting plates 22 of the stub axles 21 rock about their headed guide studs 32 from the position shown in Figure 2 to the position shown in Figure 3, or to some intermediate position. When this occurs, the wheels 20 move upwardly relative to the casing 10 and end

brackets 15, and the mounting slides 45, and consequently the brush, are moved downwardly by the lever action of the springs 50 to the position shown in Figures 3 and 6, thereby positioning the brush to more effectively clean the rug or carpet.

Usually it is desirable to complete the enclosure of the wheel and brush mountings by providing end cover plates 60. The sweeper is, of course, provided with a suitable handle (not shown), which is connected up in any suitable way to a bail 61. The usual dust pans 62 and combs 63 are also provided.

While I have shown and described one construction in which the invention may be advantageously embodied, it is to be understood that the construction shown has been selected merely for the purpose of illustration or example, and that various changes in the size, shape, and arrangement of the parts may be made without departing from the spirit of the invention or the scope of the subjoined claims.

I claim:

1. In a carpet sweeper of the character described, the subcombination of a sheet metal end bracket including a body portion having a pair of bearing pads pressed inwardly therefrom, a headed guide stud secured to the body portion adjacent one of said bearing pads, a guide strap cut from the body portion and offset inwardly therefrom and disposed adjacent the other of said bearing pads, a plate engaging said bearing pads and having one end slotted and interfitted with said guide stud for rocking and sliding movement, the other end of said plate having a reduced extension slidably interfitted with said guide strap, and an inwardly directed stub axle carried by said plate.

2. In a carpet sweeper of the character described, the subcombination of a sheet metal end bracket including a body portion having a pair of bearing pads pressed inwardly therefrom, a headed guide stud secured to the body portion adjacent one of said bearing pads, a guide strap cut from the body portion and offset inwardly therefrom and disposed adjacent the other of said bearing pads, a plate engaging said bearing pads and having one end slotted and interfitted with said guide stud for rocking and sliding movement, the other end of said plate having a reduced extension slidably interfitted with said guide strap, and an inwardly directed stub axle carried by said plate, said extension having a bearing pad of reduced area in sliding contact with said strap.

3. In a carpet sweeper of the character described, the subcombination of a sheet metal end bracket including a body portion, a headed guide stud secured to the body portion, a guide strap

cut from the body portion and offset inwardly therefrom, a plate having one end slotted and interfitted with said guide stud for rocking and sliding movement, the other end of said plate having a reduced extension slidably interfitted with said guide strap, and an inwardly directed stub axle carried by said plate.

4. In a carpet sweeper of the character described, the subcombination of an end bracket, a guide stud carried thereby, a guide strap carried by the bracket in spaced relation to the guide stud, a plate having one end rockably and slidably fitted on said stud and having its other end constrained by said strap to rocking and sliding movement on the stud, and a stub axle carried by said plate.

5. A carpet sweeper of the character described comprising a main casing, brackets secured to the ends of said casing, a pair of guiding elements carried by each bracket on each side of the longitudinal axis of the casing, each pair comprising a stud and a strap, a plate slidably and rockably fitted on the stud of each pair and constrained by the strap of said pair to rocking and sliding movement on said stud, a stub axle carried by each plate, floor wheels rotatably supported on said stub axles, a rotary brush having friction pulleys in driving engagement with said floor wheels, said brackets having vertical guides adjacent the ends of the brush, slides fitted in said guides for vertical sliding movement, brush spindles carried by said slides and supporting the brush, and spring means interconnecting the slide and stub axles to maintain the floor wheels in driving engagement with the brush pulleys and spring fulcrum means engaging said spring means intermediate the slide and axles on opposite sides of the brush axis to cause the brush automatically to move downwardly as the floor wheels are moved upwardly relative to the brackets and main casing.

BERTHOLD THIELE.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
743,838	Duffy	Nov. 10, 1903
798,765	Crossman	Sept. 5, 1905
621,639	Drew	Mar. 21, 1899
1,800,958	Pullen	Apr. 14, 1931
1,663,365	Wise et al.	Mar. 20, 1928

FOREIGN PATENTS

Number	Country	Date
474,817	Great Britain	Nov. 8, 1937