Feb. 26, 1957 E. D. PARKER ET AL 2,782,434

FLOOR SWEEPER HAVING AUXILIARY BRUSH FOR SWEEPING IN CORNERS

Filed Feb. 7, 1952 2 Sheets-Sheet 1

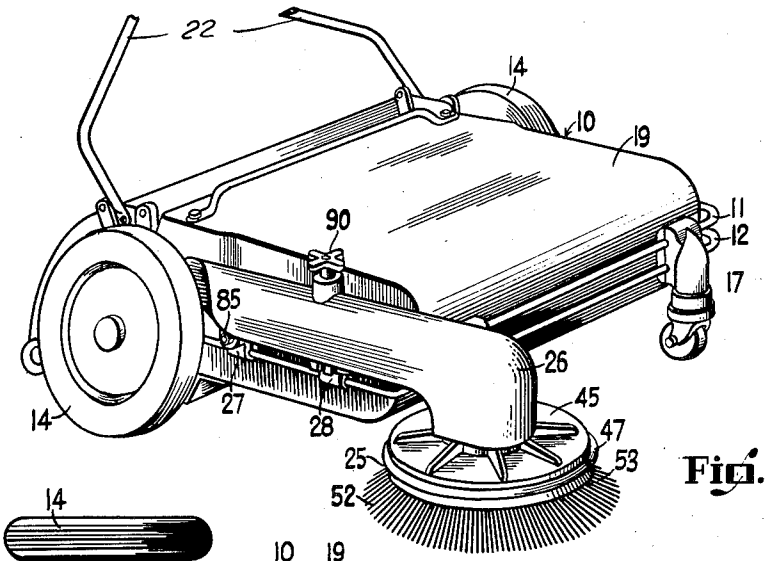


Fig. 1

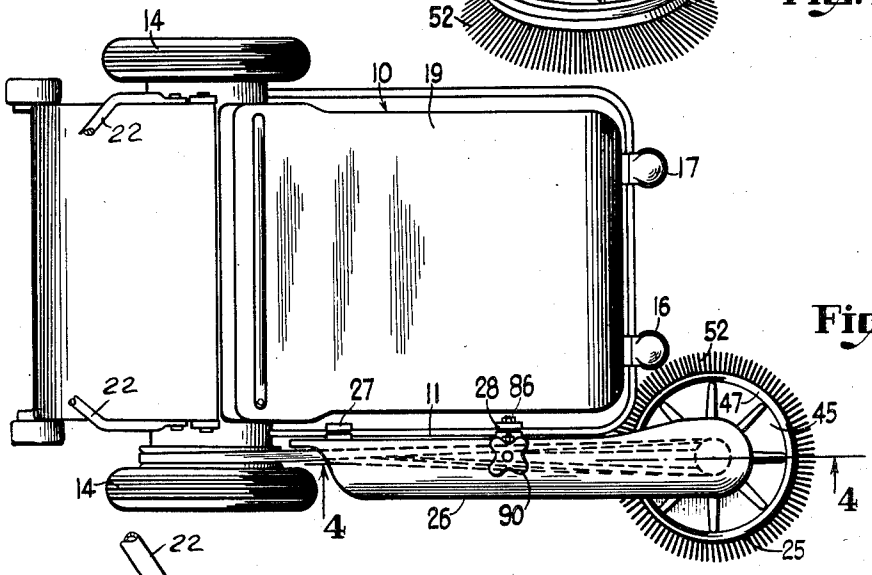


Fig. 2

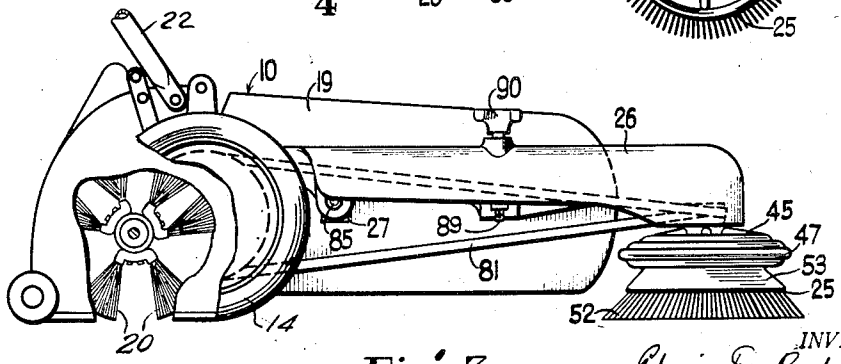


Fig. 3

INVENTOR.
Edwin D. Parker and
BY Carl E. Stelzer.
Wanner & Schmeiser,
their attorney

Feb. 26, 1957 E. D. PARKER ET AL 2,782,434

FLOOR SWEEPER HAVING AUXILIARY BRUSH FOR SWEEPING IN CORNERS

Filed Feb. 7, 1952 2 Sheets-Sheet 2

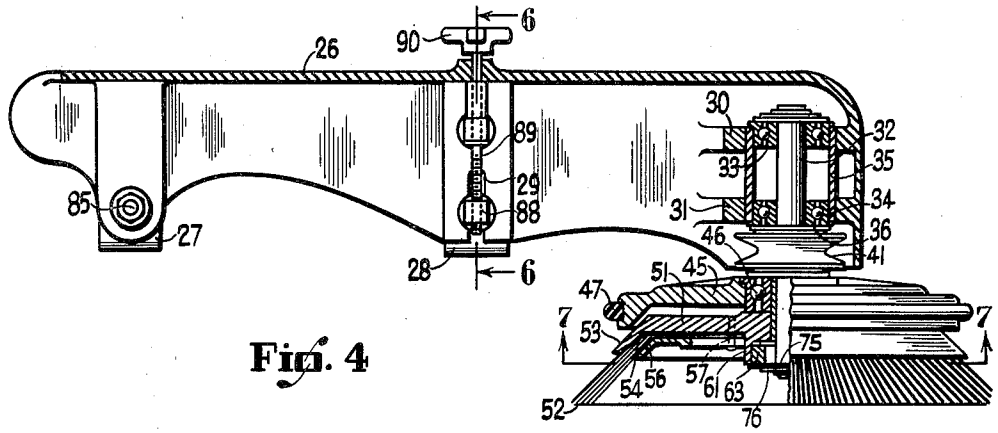


Fig. 4

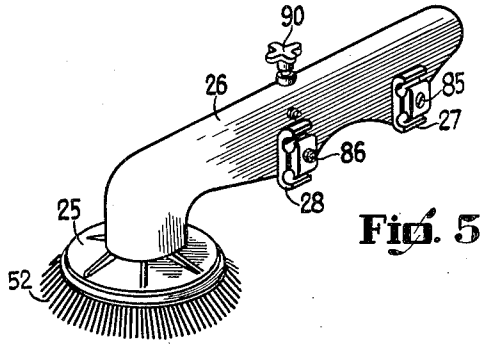


Fig. 5

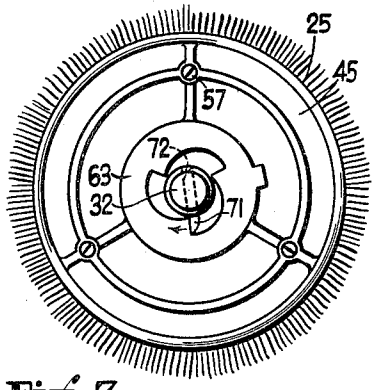


Fig. 7

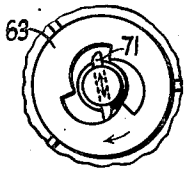


Fig. 8

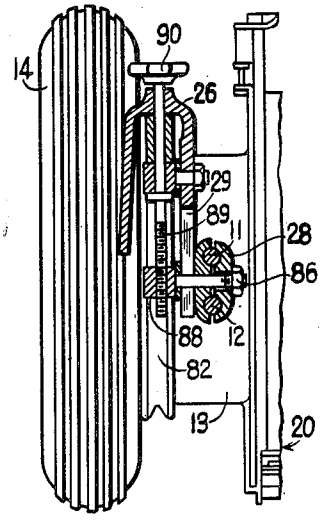


Fig. 6

INVENTOR.
Edwin D. Parker and
BY Earl L. Stelzer
Wann & T. Schmeding
their attorney

United States Patent Office 2,782,434 Patented Feb. 26, 1957

2,782,434

FLOOR SWEEPER HAVING AUXILIARY BRUSH FOR SWEEPING IN CORNERS

Edwin D. Parker and Earl E. Stelzer, Springfield, Ohio, assignors to Parker Sweeper Company, Springfield, Ohio, a corporation of Ohio

Application February 7, 1952, Serial No. 270,321

2 Claims. (Cl. 15—49)

The present invention relates to floor sweepers. This application is a continuation-in-part of our co-pending application Serial No. 128,402, filed November 19, 1949, and now abandoned.

One of the principal objects of this invention is to provide a floor sweeper with an auxiliary sweeper mounted forwardly of the main sweeper, so that the auxiliary sweeper operates upon the floor at the walls and corners of a room.

Another object is the provision of a sweeper of this character, with an auxiliary sweeper so arranged to throw debris away from walls and corners and into the path of the main sweeper.

A further object is the provision of a sweeper, having a main sweeper and an adjustable auxiliary sweeper which is supported for easy and quick adjustment to obtain proper contact between the sweeping elements and the floor.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings wherein a preferred form of embodiment of the invention is clearly shown.

In the drawings:

Fig. 1 is a perspective view of a sweeper having an auxiliary brush attached, which is constructed in accordance with this invention;

Fig. 2 is a top elevational view of the sweeper disclosed in Fig. 1;

Fig. 3 is a side elevational view of the sweeper;

Fig. 4 is a vertical sectional view taken on line 4—4 of Fig. 2 through the housing that encloses the driving means for the auxiliary sweeper. Fig. 4 also shows the auxiliary sweeping element in broken vertical section;

Fig. 5 is a perspective view of the auxiliary sweeper and housing, displaying the side of the housing that attaches to the main sweeper frame;

Fig. 6 is a broken front elevational view, partly in vertical section taken on line 6—6 of Fig. 4, displaying the means for adjustably mounting the auxiliary sweeper to the frame of the main sweeper;

Fig. 7 is a horizontal sectional view taken on line 7—7 of Fig. 4 through the auxiliary sweeping element showing the gear and pawl comprising the clutch mechanism arranged to impart unidirectional rotation to the auxiliary sweeping element, and

Fig. 8 is a broken horizontal sectional view taken on line 7—7 of Fig. 4 through the auxiliary sweeping element as in Fig. 7, showing the same gear and pawl, but in different positions relative to each other.

Referring more particularly to the drawings, it will be seen that the embodiment of the present invention disclosed in Figs. 1 to 8 therein makes use of a main sweeper indicated generally at 10. The main sweeper consists of a frame formed from tubular members 11 and 12, carried by a pair of wheels, mounted to the rear of the frame, one of which is shown at 14, and by a pair of castors 16 and 17, mounted to the front of the frame. The frame

members 11 and 12 also carry a main sweeping element 20 shown in Fig. 6, in the form of a cylindrical brush located horizontally in a position between the rear wheels so that the brushing surface operates on the floor.

Sweeping action is obtained by rotating the main sweeping brush 20 in a counterclockwise direction as viewed in Fig. 3, when the sweeper is moving in a forward direction. As the direction of rotation of the main sweeping brush 20 is opposite the direction of rotation of the wheels supporting the sweeper, it is necessary to impart rotation to the main sweeping brush by driving gears located in gear housings, one of which is shown at 13 of Fig. 6. The gear housings 13 are attached to the frame members 11 and 12 at each end of the main sweeping brush 20 and adjacent to the rear wheels 14. Being so positioned, the housing 13 encloses the gears by which rotation of the supporting wheels 14 impart counter-directional rotation to the main sweeping brush 20.

When the main sweeping brush 20 is rotated in the direction just described, debris encountered by it will be cast tangentially from the surface of the brush in a forwardly direction into receptacle 19 provided with an open end to receive the debris.

For a more detailed description of the main sweeper, Letters Patent No. 2,689,367, issued September 21, 1954, for Sweeper, should be consulted.

An auxiliary sweeping element indicated generally at 25, in Fig. 1, extends from the side of the main sweeper and projects forwardly so that it operates upon the floor at the walls and corners of the room. The auxiliary sweeper consists of an arm 26, which is clamped to the frame members 11 and 12 by a pair of clamping brackets 27 and 28, Fig. 5. The arm 26 serves as the main structural frame work for supporting the auxiliary sweeper 25 on the main sweeper 10. Arm 26, in addition, provides a housing for the driving means of the auxiliary sweeper.

Referring particularly to the clamping brackets 27 and 28, shown in Fig. 5, it is seen that they are of two piece construction adapted to grasp the tubular frame members 11 and 12. Clamping force is applied to the clamping brackets 27 and 28 by the bolts and nuts 85 and 86. These bolts and nuts also serve to attach the clamping brackets 27 and 28 to the arm 26. Although clamping brackets are shown herein as a means for removably attaching the arm 26 to the frame members 11 and 12, applicant does not wish to limit his invention thereby, as the arm 26 can well be bolted directly to the frame members 11 and 12, thereby eliminating the clamping brackets 27 and 28. It is desirable that the auxiliary sweeper 25 be readily adjustable in a vertical direction to provide for proper floor contact. To provide this feature, arm 26 is pivotally mounted to the main sweeper 10 by bolt and nut 85. Forwardly of the pivot point a second bolt and nut 86 passes through a clearance slot 29 in the arm 26, so as not to engage the arm 26. Instead, bolt and nut 86 fasten to an internally threaded element 88, so adapted to move vertically up and down along the axis of a cooperating externally threaded element 89, the latter being pivotally mounted to the arm 26, so as to be manually rotatable by the handle 90. The threaded elements 88 and 89 just described, are shown and set forth so that the internally threaded element 88 is mounted to the main sweeper 10 and the externally threaded element 89 is mounted to the arm 26. Applicants do not wish to limit their invention thereby, as the threaded elements 88 and 90 could be interchangeably mounted, without departing from the spirit of applicants invention. For example, externally threaded element 89 could be mounted to the main sweeper 10 so adapted that its cooperation with internally threaded element 88, mounted on arm 26, would allow vertical adjustment of the auxiliary sweeper 25.

Referring particularly to Fig. 4, the method for mounting and driving the auxiliary brush **25** is clearly shown. Within the arm **26** at its forward end, two webs **30** and **31** are horizontally formed to provide mounts for the bearings **33** and **34**, which in turn carry the rotatably mounted shaft **32**. A bearing liner **35** with felt seals **36** mounted at each end thereof serve to confined grease to the bearings.

Keyed to the shaft **32**, vertically below the lower grease seal **36**, is a V-grooved pulley **41** driven by a V-belt displayed at **81** in Fig. 3. Assembled on shaft **32** vertically below the pulley **41**, is a guard plate **45** rotatably mounted on bearing **46**, and provided with rubber bumper ring **47**. Normally the guard plate **45** is free of rotation, as no motion can be imparted to it by the rotation of shaft **32**. Upon contacting a wall, however, guard plate **45** is free to roll along the wall while the sweeper is being moved forwardly or rearwardly, and thereby, marring of the wall is prevented.

Assembled on shaft **32** vertically below the guard plate **45** is a brush plate **51** having its circumferential edge **53** flared downwardly and outwardly to provide a mount for holding brush **52** at the desired angle. The upper ends of the fibers **54** of brush **52** are clamped between brush plate **51** and clamping ring **56**. Clamping force is applied by the tightening of screws **57**, which fasten the clamping ring **56** to the brush plate **51**. Brush plate **51** is formed with a partially hollow central hub **61**. This hub is recessed to receive the clutch mechanism shown generally in Figs. 7 and 8.

The clutch mechanism is adapted to transmit unidirectional rotation from the shaft **32** to the brush plate **51**, and consists of a driving pawl **71**, in the form of a pin, carried by hole **72** in shaft **32**, said pawl being adapted to drive gear **63**, thereby rotating brush plate **51** to which driven gear **63** is rigidly mounted.

Referring particularly to Fig. 7, the pawl **71** is shown engaging gear **63** in the driving position. As shown, any clockwise rotation of shaft **32** will be imparted to the brush plate **53**. The gear and pawl assume this configuration when the main sweeper is being moved in a forwardly direction. Referring next to Fig. 8, the pawl **71** is shown in a non-driving position, said pawl being free to move in hole **72**, is riding freely on the non-driving side of the tooth gear **63**, in the nature of a follower riding on a cam. This latter configuration, shown in Fig. 8, occurs when the main sweeper is moved rearwardly so that counterclockwise rotation is imparted to shaft **32**. In such instance the auxiliary brush is not rotated, and therefore debris cannot be thrown away from the path of the main sweeper.

Below the brush plate hub **61** a washer **75** is held in place by a split spring retaining ring **76**, which engages around shaft **32** at its lower end. Said washer covers the hollow recess in hub **61** wherein is located the clutch mechanism set forth above.

Referring to Fig. 6, the driving wheel **14** carries a V-pulley **82**, which in turn carries a V-belt, best seen at **81** in Fig. 3. The driven V-pulley **41**, shown in Fig. 4, also carries V-belt **81**, so that rolling of the wheels **14** along the floor transmits motion through the cooperating belt and pulley system, thereby imparting rotation to auxiliary brush **25**. For example, in operation of the sweeper, its forward motion rotates the supporting wheels **14**. The driving V-pulley **82** rotates the driven V-pulley **41** as they carry a cooperating V-belt **81**. V-pulley **41** rotates shaft **32** by which it is carried. Shaft **32** imparts its rotation to auxiliary brush **25**, as pawl **71** is engaged to drive its cooperating gear **63**. Assume that the sweeper is being moved adjacent and parallel to a wall surface. Auxiliary brush **25** will then be sweeping against the wall, casting debris tangentially away from the rotating auxiliary brush **25**, and into the path of the main brush **20**, which in turn

picks up the debris cast before it and discharges it into receptacle **19**.

Suppose that the sweeper is being used to sweep an area not adjacent to a wall surface. It is at times necessary to move the main sweeper rearwardly over an area not yet free of debris. In such an instance, the rearward rolling of wheels **14** will transmit rotation through the V-pulley system to shaft **32**, but rotation will not be imparted to auxiliary brush **25**, as the gear **63** and pawl **71** will be cooperating in the override position, shown in Fig. 8. Therefore, no debris can be cast away from the path of the main sweeping brush **20**.

Suppose for instance, bristles **52** of auxiliary brush **25** become worn from usage, so that they no longer efficiently contact the floor. The operator can lower the auxiliary brush to achieve proper floor contact by turning handle **90** on the externally threaded element **89**, which co-acts with internally threaded element **88** to vertically adjust the auxiliary brush **25** relative to the main sweeper **10** in a manner previously described herein.

While the form of embodiment of the present invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow:

We claim:

1. In a floor sweeper of the type having a frame carried by front and rear wheels and carrying a main sweeper and debris receptacle, the combination with said frame; of a housing lying alongside the frame and extending forwardly of the frame; a rotating brush lying forwardly of the frame; means for rotating said brush including a vertically extending shaft journalled in the forward end of the housing, said brush being carried by the shaft, said means also including driving mechanism connected with the shaft and extending rearwardly therefrom, said housing overlying said means; and means for adjustably attaching the housing to the frame, said last means including a horizontally extending pivot carried by the frame and on which the housing is mounted for swinging in a vertical plane, a vertically extending screw element and a cooperating threaded element, said elements being spaced horizontally of the pivot, one of said elements being carried by the frame and the other of said elements being carried by the housing.

2. In a floor sweeper of the type having a frame carried by front and rear wheels and carrying a main sweeper and debris receptacle, the combination with said frame; of a housing carried by and lying alongside the frame and extending forwardly of the frame; a rotating brush lying forwardly of the frame and rotatably supported by said housing; means for rotating said brush including a vertically extending shaft journalled in the forward end of the housing, said brush being carried by the shaft, said means also including driving mechanism connected with the shaft and extending rearwardly therefrom, said housing overlying said means; and means for adjustably attaching the housing to the frame, said last means including a horizontally extending pivot carried by the frame and on which the rear end of the housing is mounted for swinging in a vertical plane, a vertically extending screw element and a cooperating threaded element, said elements being spaced horizontally and forwardly of the pivot, one of said elements being carried by the frame and the other of said elements being carried by the housing.

References Cited in the file of this patent

UNITED STATES PATENTS

483,833	Chase	Oct. 4, 1892
1,129,118	Pereira	Feb. 23, 1915
1,407,180	Todd	Feb. 21, 1922
1,507,317	Laberge	Sept. 2, 1924
1,650,660	Simpson	Nov. 29, 1927
2,283,229	Richards	May 19, 1942