United States Patent

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[33] **Australia**
[31] **55579/69**

[54] **CARPET SWEEPER**
12 Claims, 4 Drawing Figs.

[52] U.S. Cl. **15/48**
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[50] **Field of Search** 15/48, 41, 42, 43, 45

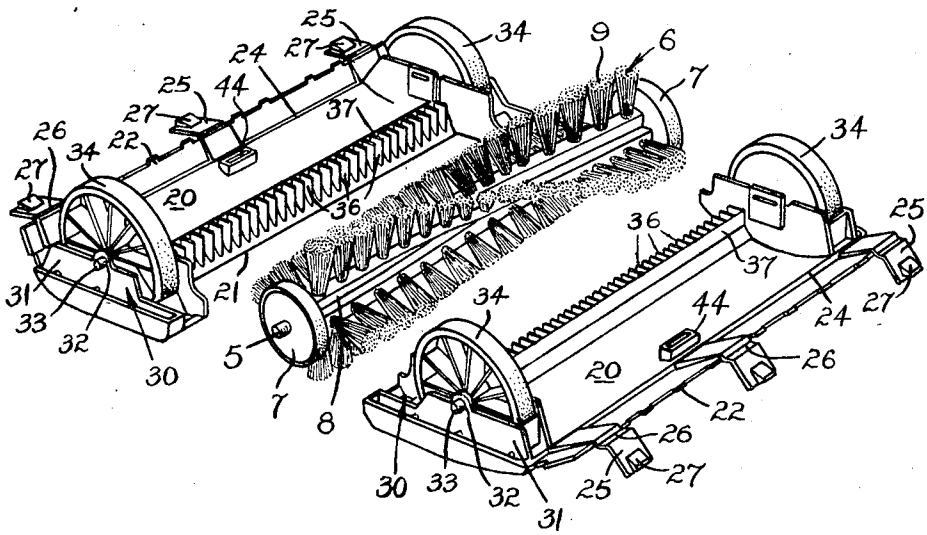
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ABSTRACT: A carpet sweeper in which the trays which receive the material swept up by a central brush are themselves hinged and carry the wheels and a comb which contacts the brush to ensure effective removal, a feature being that as the trays together with the wheels move clear of the brush for discharging of the materials much more ready and effective cleaning as well as collection of the materials is possible.



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SHEET 1 OF 2

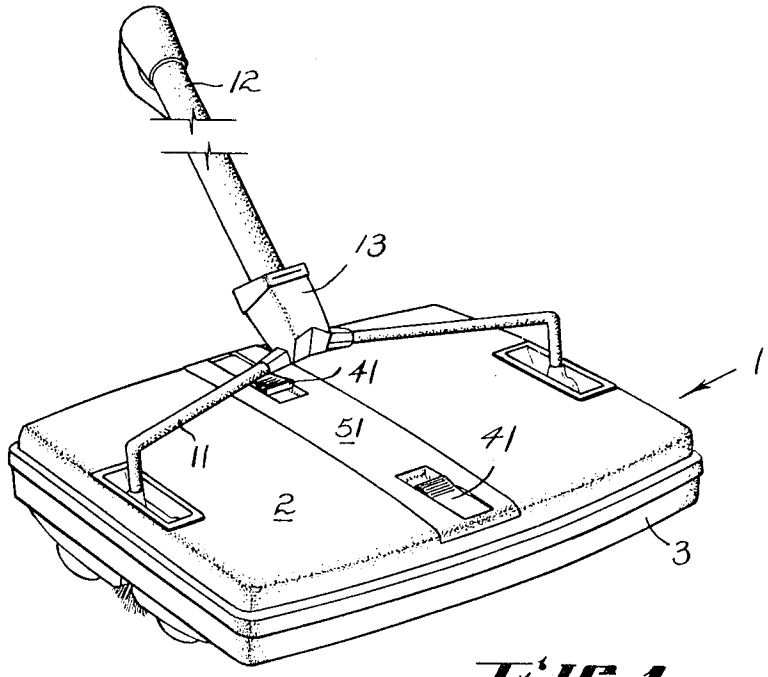


FIG 1

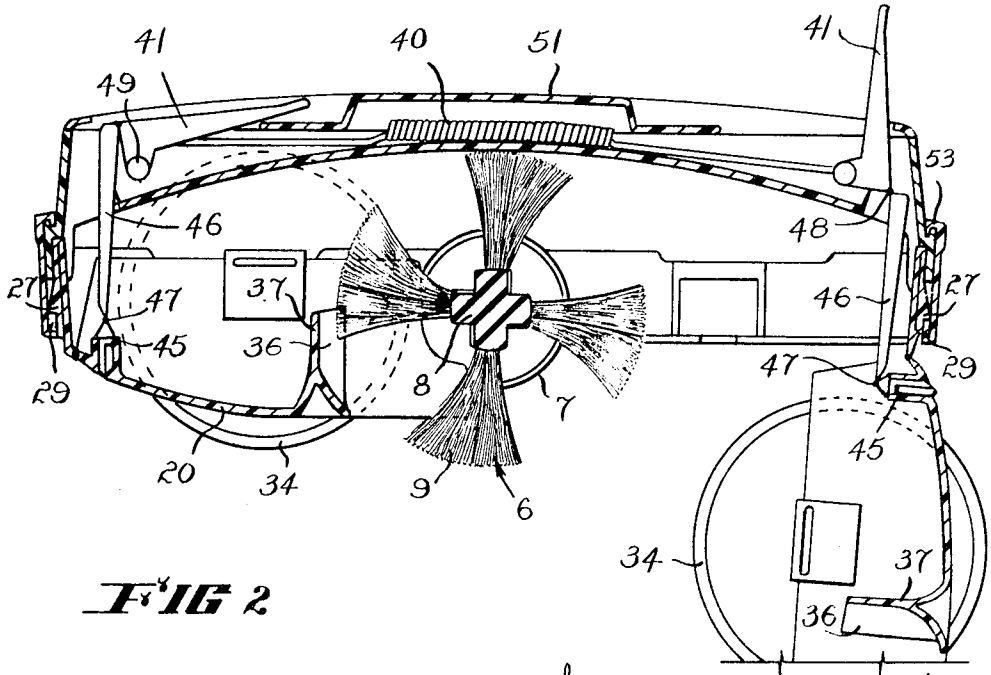
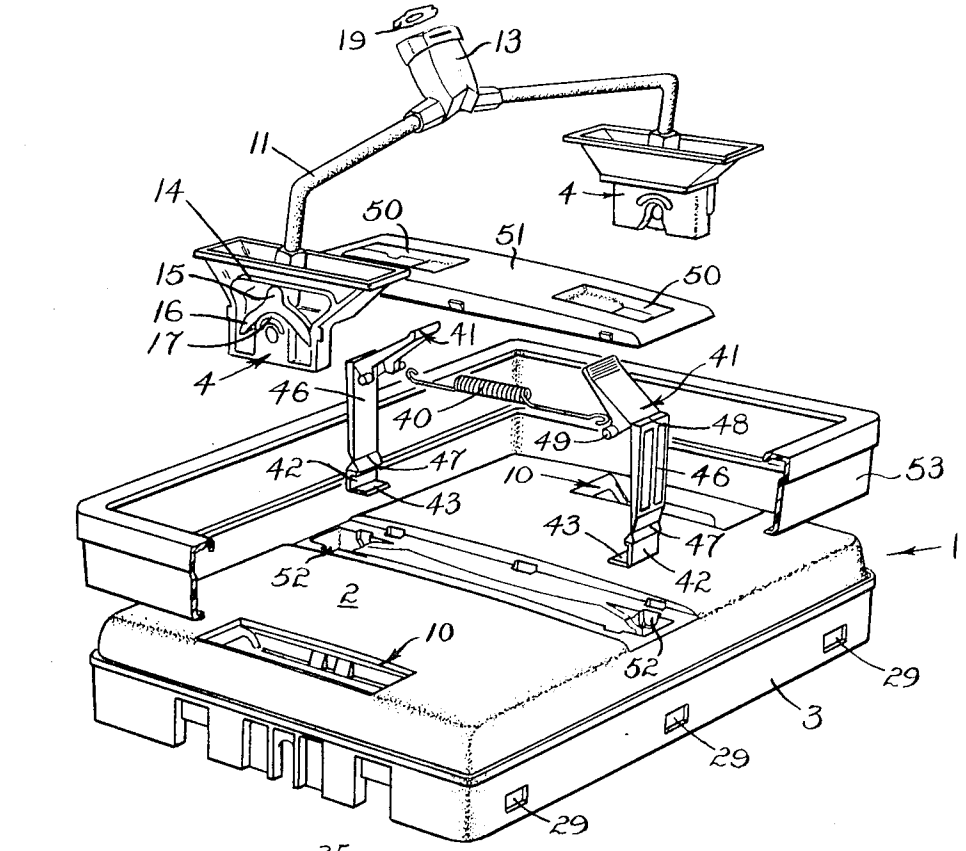


FIG 2

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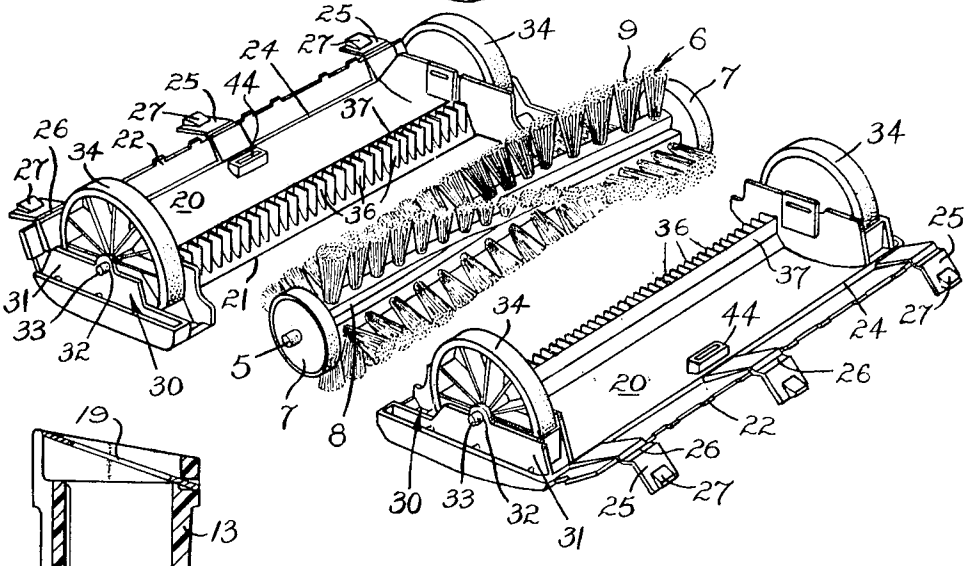


FIG 3

FIG 4

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CARPET SWEEPER

This invention relates to an improved carpet sweeper.

Carpet sweepers usually comprise a body having a pair of wheels at each end which drive, by friction, a brush which sweeps the material on to dust trays which are hingedly connected to the cover or body of the unit so that material collected by the brush can be discharged.

It is customary to fix the wheels to side members on the body and to spring load these wheels in such a manner that they are urged inwardly against a driving roller fixed to the brush, which brush and driving rollers are removable as a unit to allow the brush to be cleaned.

The dust trays are normally hinged about their inner ends and provided with means whereby they can be opened or held in a closed position.

While the foregoing type of sweeper is satisfactory for its purpose, the object of the present invention is to provide certain improvements both in the construction and operation of the sweeper and this is achieved according to this invention by mounting the brush, together with its driving rollers. centrally across a body but arranging the dust trays to hinge about their outer portions so that they can completely clear the brush when open and give better access to the brush and also afford better discharging of the unit, a further feature being the inclusion of the wheels as part of the dust trays so that the wheels move with the dust trays and require no separate fixing to the body, the whole assembly preferably being so arranged that the various parts interlock without the use of any bolts or the like.

The invention can of course be considerably varied so far as its constructional features are concerned, and many of the features to be later described herein are not essential parts of the basic concept of this invention, but to enable the nature to be fully appreciated a preferred embodiment will now be described with reference to the accompanying drawings, but it is to be clear that the invention need not necessarily be limited to such an embodiment.

In the drawings:

FIG. 1 is a perspective view of a sweeper embodying the features of the invention,

FIG. 2 is a cross section of such a sweeper, showing one tray swung out for removal of material which may have lodged in the tray,

FIG. 3 is an exploded view of such a cleaner, and

FIG. 4 shows in section the quick release handle socket.

A body member 1 comprising a top 2 and depending sides 3 is formed of a suitable plastic or similar material and is adapted to carry support members 4 which can engage the trunnions 5 of the brush 6, rollers 7 being formed at each end of the brush 6 in the customary manner. The brush is of helical shape and comprises a core 8 and bristles 9, the core having the rollers 7 rigidly attached thereto and carrying the trunnions 5.

The support members 4 can be clipped into the body of the sweeper from above through the apertures 10 in the body member 1, which members 4 also serve to support the handle mount 11 in such a manner that the handle 12 can be engaged in a socket 13 on the handle mount and swung from an operative position where it is at an angle to the body as shown in FIG. 1, to an upright position where the sweeper can be readily stored.

The method of attaching the handle bracket 11 to the bearing members is to utilize a slide 14 which guides a follower 15 which forms part of the handle mount 11 at each end thereof the follower moving along the guide in a horizontal direction, but a pair of cams 16 depend from this follower 15 and operate around the guide 17 on the support member 4 in such a manner that while no actual hinge pin is necessary, the handle can be swung from its one position to the other about a fulcrum by means of the particular slide 14 in association with the cams 16 which engage the guides 17.

The particular fittings for supporting the trunnions 5 of the brush 6 and the handle mount 11 can be formed of plastic but

are preferably metal plated to give good wearing characteristics as well as assisting in ornamentation as these members are visible from the top of the body. The handle socket has an inclined spring blade 19 which engages the handle to hold it unless the spring blade is depressed at its raised end to release the handle.

The dust trays 20 are of a shape to each cover somewhat less than one-half of the underside of the sweeper but leaving sufficient space between the inner edges 21 of the two members to accommodate the brush 6 which can thus operate therethrough when sweeping a surface, these trays 20 having integrally formed attachment members 22 which are joined to the walls of the trays 20 by a very thin web 24 of the moulding so that a hinge is formed which allows the trays 20 to swing from their operative to their discharge position.

The type of hinging used, being of flexible plastic, has the effect of causing the forward wheels to drive at any stroke because of the give of the plastic allowing the wheels to firmly press against the rollers 7.

The attachment members 22 have on them a series of tabs 25 which are also hinged to the attachment member 22 by thin webs 26 of the material during moulding, the tabs being provided with outwardly extending bosses 27 which, when the tabs 25 are pushed into the front and rear walls of the body 2, the bosses 27 spring outwardly into the apertures 29 to form a lock which can then only be released by forcing back the tabs by means of a suitable instrument.

Thus the dust trays 20 can be assembled on the outer walls of the body by simply bending back the tabs 25 to lie against the attachment members 22 and inserting tabs in the apertures 29 in the body whereupon the assembly will be located and held.

At each end of each of these dust trays 20 is a flanged recess 30 adapted the flanges 31 of which are apertured at 32 to engage the axles 33 of transport wheels 34. The axles can be disengaged from the flanges 31 by the application of an appropriate force if it is necessary to replace a wheel.

In this way each of the dust trays carries a wheel at each end and the positioning of these wheels is such that when the dust trays are closed, both wheels 34 at each end are in engagement with the rollers 7 fixed to the brush 6, the flexibility of the material from which the trays are constructed being so selected that the wheels 34 are automatically loaded against the driving rollers 7 with the required force without the need of using spring mounting for these wheels as has been customary heretofore.

The inner edges of each of these dust trays are provided with combs 36 which are arranged to project inwardly from a flange 37 on the trays 20 so that the combs are of tapered shape with their backs against the flanges 37 and their operative ends in position against the brush 9, the shape however being such that when the brush operates in one direction (towards the upper ends of the teeth) it cleans the comb 36 at that side by pushing material picked up by the brush 6 upwardly off the ends of the comb 36 into the tray 20 over the flange 37 which forms part of the combs, but the opposite side of the comb is at the same time acting to remove material from the brush 6 and hold it on the upper ends of the comb on that side.

On reversal of the direction of motion of the sweeper of course the action is reversed and the material caught on the last said comb is swept into its associated tray.

This particular arrangement ensures that there is a highly effective picking up and depositing in the trays of dust and other materials which move through the combs but the combs instead of being open members as heretofore have a back to them and forms as it were a series of channels between the teeth increasing the depth upwardly so that materials carried by the brush 6 are swept on to these teeth and either pass over the flange 37 into the appropriate tray, but on reverse motion the same comb has material such as threads which have been removed from the brush, lifted over the flange 37 and again deposited in the adjacent tray.

As it is necessary to normally hold the trays in a substantially horizontal position beneath the body but to allow the trays to swing downwardly from discharge of gathered material, and for this purpose the trays **20** are loaded by the spring **40** which engage moulded release levers **41** which have at their lower end a tab **42** with a return lock **43** which can be engaged in a socket **44** on the associated tray and will then expand in position as described with the main tray hinging, as the end of this member **42** will be firmly joined to the tray after being pushed into the socket **44**, the lock **43** preventing withdrawal by engaging behind a projection **45**.

The tab **42** is hinged to the operating links **46** by a thin section **47** while the other end of the links **46** is connected to the release lever **41** by a thin section **48**. The release lever **41** has trunnions **49** on it the lever **41** engaging a socket **50** in the center plate **51** and the trunnions **49** engaging in sockets **52** in the top of the body member **1**.

The arrangement of this assembly is such that each lower tab **42** which fixes that assembly to the tray is permanently attached to the tray by being engaged in the socket **44**, but releasable on the insertion of a blade or the like if replacement is required, while the links **46** which extend upwardly, transmits motion from the release lever **41** to the appropriate tray **20**, so that if this member is moved in an up or down position by adjusting the release lever **41** about its trunnion **49** it has the effect of closing or opening the appropriate tray. The release levers **41**, which when the trays are closed lie approximately parallel to the upper surface of the body **1** are raised about the trunnions **49** when it is desired to open the trays the spring **40** which exerts a pull between the release levers **41** holding the levers **41** inwards and thus the trays **20** in their closed position. Lifting of the free ends of the release levers however opens the dust trays to which they are connected.

It will be noted that each dust tray has a similar opening and closing assembly and these assemblies are locked in position by the center plate **51**. The trunnions **49** are held therein also by tension of the spring **40**.

This then provides a very simple assembly in which the tray operating mechanisms are simple moulding with a pair of hinges and trunnions arranged so that the assemblies can simply be placed into position and held by the spring **40**.

The spring **40** also ensures that the wheels **34** are held in good contact with the driving rollers **7**.

Thus in the complete assembly just described only a single loading spring is necessary between the two release levers **41** and this achieves the object both of holding the dust trays **20** in their open or their closed position and also ensuring that in the closed position the wheels **34** which are carried on the dust trays **20** themselves are in adequate contact with the driving rollers **7** of the brush **6**.

Throughout the construction use is made of the aforesaid attachment tabs which though moulded as flat pieces, have an intermediate hinge formed by a thin section so that the end part can be folded back on the remainder of the tab but will tend to expand outwardly when forced into a socket, and the end portion can project sufficiently to lock against an appropriate notch in the socket and thus form a secure fixing as shown particularly in FIG. **2**.

From the foregoing description it will be realized that a carpet sweeper having very material advantages results because firstly because of the outward hinging of the dust trays, which ensures that the body which carries the brush has its interior completely expose when the two trays are opened, giving highly effective removal of debris picked up by the sweeper and also giving full access to the brush for cleaning or other purposes.

Secondly where the wheels **34** are fixed directly to the ends of the dust trays **20** the advantage is achieved that no supporting means for the wheels, other than the axles **34** which engage the dust trays, are necessary and this does away with the need of the loading which must otherwise be used on these wheels to hold them into engagement with the driving rollers of the brush, this according to the prior art usually requiring slotted bearing means with special spring loading to achieve the necessary motion. Also as the wheels in this case are mounted directly on the dust trays there is a much easier releasing of the brush because the wheels move away from the driving rollers and as stated earlier completely expose the brush for servicing or for removal of foreign matter or for removal of the brush itself.

A further advantage results if the combs are formed in the nature of channels in the inner wall of the dust trays because the combs then serve as guiding means for the materials discharging into the trays, but more important still as these combs are formed on the inner ends of the dust trays, they completely clear the assembly when the trays are open and fully expose the combs for cleaning should this be necessary.

The ready assembly by using the form of tab described will be fully apparent and the method of moving the trays from their operative to their discharge position by the simple mouldings which include the finger tabs will also be fully appreciated.

The rectangular member **53** is a soft moulding of resilient material which can be fitted over the body member **1** to provide buffer means to protect the said body member and give a soft bumper which will not damage surfaces when the sweeper contacts such surfaces when in use.

While one complete embodiment of the invention has been disclosed herein, it will be appreciated that modification of these particular embodiments of the invention may be resorted to without departing from the scope of the invention as defined in the appended claims.

What we claim is:

1. A carpet sweeper comprising a hollow body member, a brush rotatably carried transversely and substantially medially in the body member, and having driving rollers thereon, a handle mount on the body member, trays hinged to the body member along outer transverse edges of the body member and facing inwards to terminate adjacent the said brush to receive materials gathered by the brush, and wheels carried by the said trays located such that when the trays are in collecting position the wheels contact the said driving rollers on the said brush and rotate it as the sweeper is moved but move away from the brush when the trays are opened for cleaning.

2. A carpet sweeper according to claim **1** characterized in that the trays carry on them in the path of the rotating brush a pair of combs one on each tray, so positioned when the brushes operate in one direction the combs receive from the brush, such material as is swept up by the brush but on a reverse rotation of the brush the combs are oppositely swept by the brush to deposit the swept materials into the trays.

3. A carpet sweeper according to claim **1** characterized in that the body has sockets along the forward and rear edges in relation to the direction of movement to the sweeper, and in that attachment members on the trays engage the sockets to lock the trays to the body, said attachment members and trays being constructed of resilient plastic material having thin sections between them to form hinges, said attachment members having tabs on them adapted to lock in the sockets of the body when engaged therein.

4. A carpet sweeper according to claim **1** characterized by flanges at each end of the trays between which wheels are accommodated, the axles of which wheels engage apertures in the said flanges.

5. A carpet sweeper according to claim **1** wherein the trays carry combs positioned in the path of the bristles of the brush, said combs being backed by flanges forming an inner boundary to the tray whereby materials swept by the brushes over or on to the flanges are deposited in the tray or caught on the comb teeth attached to the flanges, whereby on reversal of rotation of the brushes, materials caught on the comb teeth are brushed over the flanges into the tray.

6. A carpet sweeper according to claim **1** wherein the trays carry both the wheels and the combs remotely of the attachment members so that when the trays are positioned to discharge materials deposited by the brushes, the wheels and

combs are positioned remotely of the brush to allow ready cleaning of the combs and to facilitate removal of the brush for cleaning.

7. A carpet sweeper according to claim 1 wherein the actuation of the trays is by means of release levers carried by body-engaging members which themselves have operating links engaging tabs formed on the trays remote from the hinges of the attachment members which hingedly couple the trays to the body member.

8. A carpet sweeper according to claim 7 wherein the release members and the operating links and the tabs are formed from plastic mouldings with thin sections between the release levers and the operating links, and between the tabs and the operating links, and wherein the release levers have trunnions which engage a central strip on the body, and wherein the release levers are positioned to normally hold the trays in their closed position where the combs on the trays are in the path of the brush.

9. A carpet sweeper according to claim 1 wherein the body member has engaged over it a surround of resilient plastic material to provide buffer means during operation of the sweeper.

10. A carpet sweeper according to claim 1 wherein the handle mount has a follower at each end engaging a slide in a support member adapted to be engaged in apertures in the body member, said follower having a pair of cams integral therewith which engage a part on the said support member to cause the follower to maintain contact with the slide when a handle engaged in a socket on the handle mount is swung from a position of rest to an operative position.

11. A carpet sweeper according to claim 1 wherein the said body member has apertures near each end which engage two support members arranged one at each end of the handle mount, said support members engaging said body and being held thereto, and clips on the support members to lock the support members in the apertures of the said body.

12. A carpet sweeper according to claim 1 wherein the body member has a central longitudinal aperture, and a central strip adapted to be engaged in said aperture, said central strip carrying spring loaded release levers and operating links coupling to the trays remote from their hinging means whereby manipulation of the said release levers opens and shuts the said trays for respective cleaning or receiving matter swept thereinto by the said brush.

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