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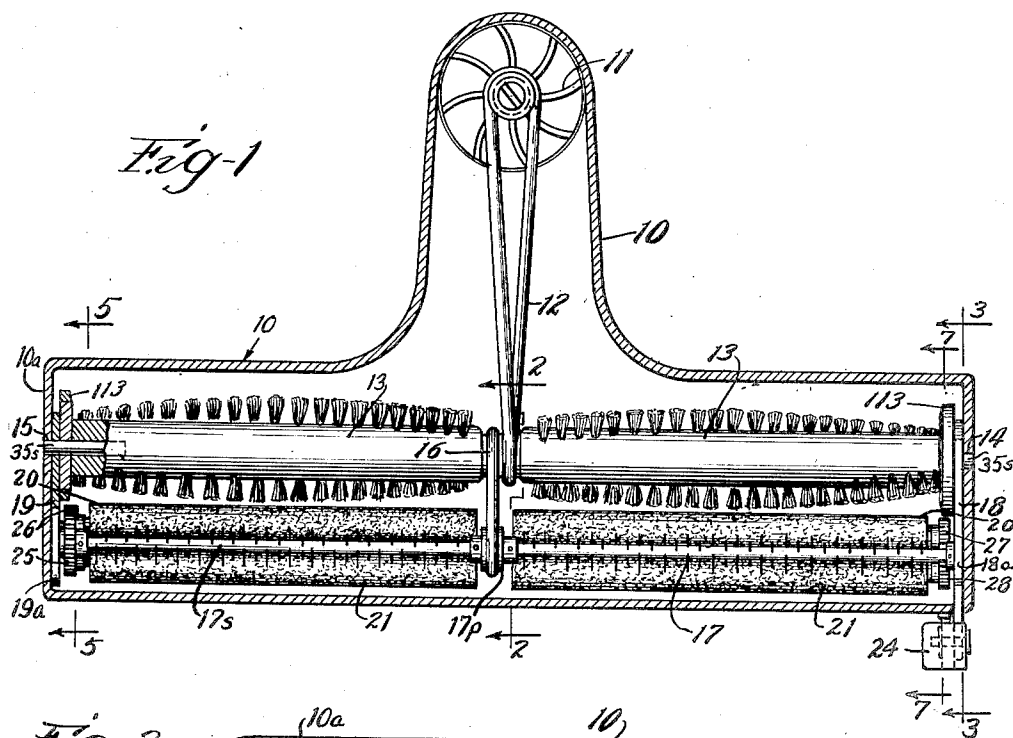
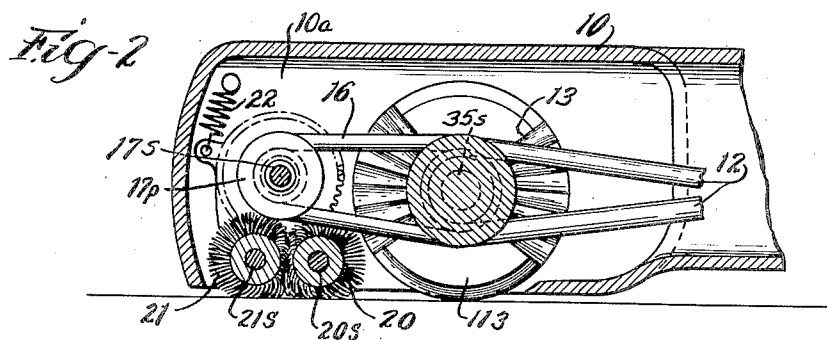
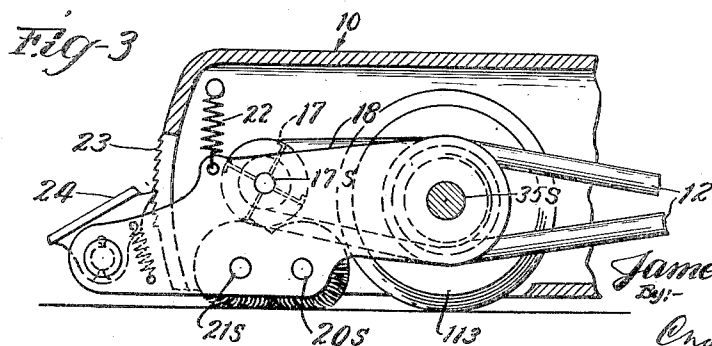
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2,651,803

PICKUP BRUSHES FOR SWEEPERS

Filed Feb. 16, 1949

2 Sheets-Sheet 1



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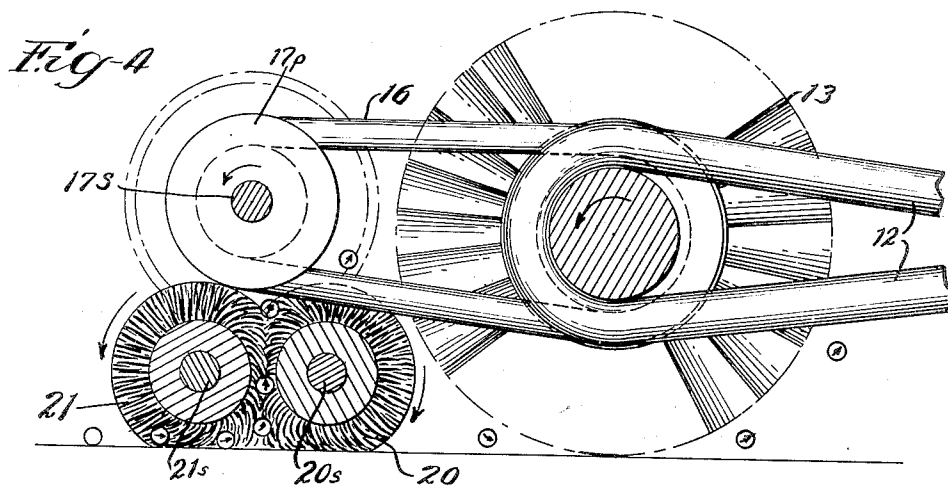
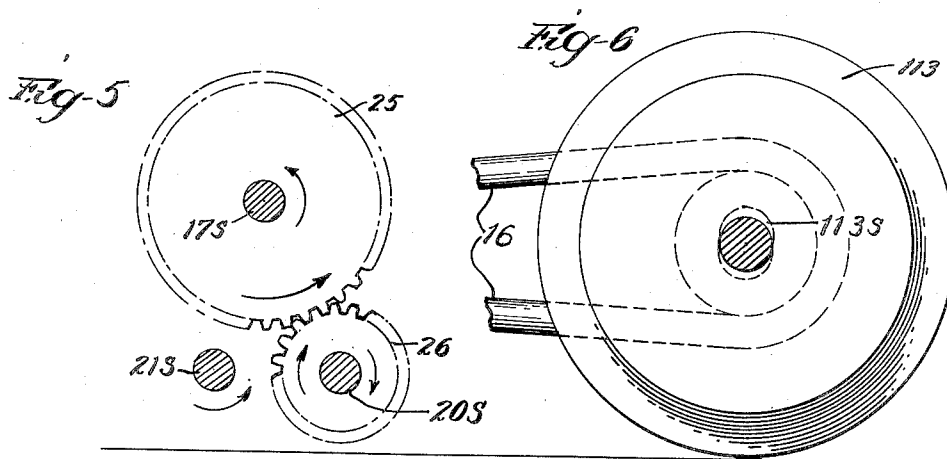
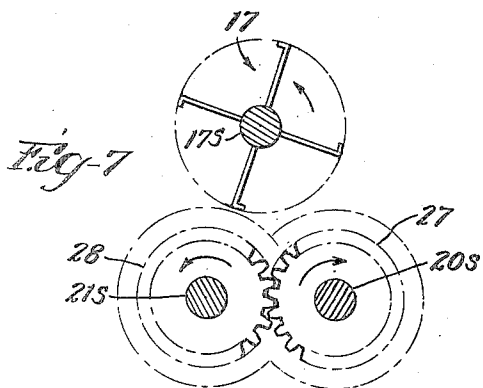
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UNITED STATES PATENT OFFICE

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PICKUP BRUSHES FOR SWEEPERS

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6 Claims. (Cl. 15-373)

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This invention relates to pick up brushes for carpet sweepers or the like. These brushes may be independently used as a sole pick up means for sweepers in general, or the brushes may be embodied as a cooperative means for conventional sweepers performing the function of pick-
 5 ing up and depositing in the sweeper all extraneous loose particles such as pins, buttons, threads and so forth normally found on floors. Although the device will be described as applied to carpet sweepers, it obviously has wider application to sweepers of all kinds.

The need for such pick up devices is well known. As a matter of experience, sweepers are notoriously deficient in this pick up function. It appears that normal sweeping functions of sweepers are held inadaptable for the pick up function and that some special arrangements are indicated.

Corollary to this situation is the fact that the pick up feature of sweepers is not continuously needed. Occasionally when pick up is required, the normal pick up function of the sweeper brushes is inoperative due to clogging or other causes. Preferably, pick up brushes should be disengaged or adjustable for use when required.

It is one of the principal objects of the present invention to provide dual pick up brushes that coact with each other to pick up particles from any surface.

Another object is to provide dual coacting pick up brushes in a sweeper that may be adjustably mounted so that the pick up brushes may be moved from operative to non-operative positions so that wear on the brushes may be minimized when not in use.

Another object is to provide dual pick up brushes that may be cleaned and free of extraneous materials so that maximum effectiveness of the brushes may be maintained.

Other objects and benefits will be disclosed in the following descriptions and drawings. It will be understood that the device will be mainly illustrated as applied to a conventional vacuum sweeper, although it will be understood that it has application to all sweepers.

Now referring to the drawings,

Fig. 1 is a horizontal sectional view of a vacuum sweeper showing the general arrangement of my pick up brushes as applied thereto;

Fig. 2 is an enlarged side view of the vacuum sweeper shown in Fig. 1 as it would appear on the section line 2-2 of Fig. 1;

Fig. 3 is an enlarged cross sectional view similar to Fig. 2 as the structure would appear on the section line 3-3 of Fig. 1 showing an adjustment device;

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Fig. 4 is an enlarged sectional view taken end-wise of the dual pick up brushes mounted in conjunction with a conventional sweeper brush to show how the pick up brushes may be applied for cooperation with a sweeper brush;

Fig. 5 is a side elevation view of the pick up brush drive device as it would appear on the section line 5-5 of Fig. 1;

Fig. 6 is a detail elevation view of a modified arrangement using a rubber tired sweeper supporting wheel of a conventional carpet sweeper to frictionally drive the main sweeper brush and showing how the drive may be transmitted to the pick up brushes; and

Fig. 7 is another sectional view of the dual pick up brushes to better illustrate the cleaning device used in conjunction with these brushes.

Now referring to the drawings and at the outset to Fig. 1, I show a conventional vacuum sweeper housing 10 with a suction fan 11 mounted therein. It will be understood that the fan is driven by an electric motor as is the usual practice in the art but not illustrated herein. From the fan motor shaft there is a belt 12 attached to a central pulley portion on the conventional sweeper brush 13 to transmit the drive from the fan motor shaft to the brush 13.

Brush 13 is preferably provided with stub end shafts 35s suitably journaled at 14 and 15 in end walls 10a of housing 10. A drive belt 16 is trained over the central pulley portion of the brush 13 and connects with a pulley 17p to transmit rotary motion to shaft 17s comprising the shaft of the cleaning device 17 which coacts to clean the bristles of the pick up brushes 20 and 21. Brushes 20 and 21 are supported for rotation upon the closely set shafts 20s and 21s whereby the bristles of brushes 20 and 21 intermingle and intermesh during rotation of the shafts 20s and 21s to carry out the pick up function.

A pair of brackets 18 and 19 are carried adjacent the end walls 10a of the housing 10 and are pivotally supported upon the stub end shafts 35s for bodily swinging movement relatively thereto and to the housing. The pick up brushes 20 and 21 are connected with the swingable ends 18a and 19a of the brackets by means of the associated brush shafts 20s and 21s. Shaft 17s is also suitably mounted upon the swingable ends of the brackets 18 and 19 to dispose this shaft in a predetermined given relation with respect to the pick up brushes 20 and 21 for cleaning the latter and to free the brushes of entwined or entrained foreign particles or matter. Thus, it will be understood that the cleaner device 17 and the brushes 20 and 21 are mounted in the end brackets

18 and 19 pivotally mounted to swing upon the shafts 35s as is well illustrated in Fig. 3. The end brackets may be moved upwardly and out of contact with the floor by permitting the tension spring 22 to move these brackets upwardly when the ratchet 23 is released by the foot dog 24. Thus the contact of the brushes 20 and 21 may be adjusted from a suitable inoperative position having no contact with the floor to a depressed and brush bristle deflecting floor contacting position as desired by the operator and for the proper pick up functioning of the brushes 20 and 21.

Now referring to Figs. 5 and 7, the drive to the brushes 20 and 21 is arranged to provide opposite rotation of these brushes which is necessary to the present invention. The shaft 17s revolving counter-clockwise as indicated by the arrow in Fig. 5 is driven from the belt 16 and shaft 17s has on its left hand and in consideration with Fig. 1, a gear 25 which is held by the bracket 19 in meshing contact with the gear 26 mounted on the left hand end of the shaft 20s as viewed in Fig. 1. Naturally, this shaft will drive and rotate clockwise. It will be observed that the shaft 21s at the left hand rotates freely in bracket 19. However, on the right hand side of the sweeper on the right hand end of the shaft 20s is a gear 27 which meshes with the gear 28 on the shaft 21s as clearly shown in Fig. 7. Thus, the brushes 20 and 21 are rotated in opposite directions as clearly indicated by the arrows. The cleaning comb 17 mounted on the shaft 17s is a conventional device. The rotating fingers 17 provide the instrumentalities for cleaning the brushes 20 and 21 from extraneous matter so that the bristles in the brushes are maintained in a clean effective manner.

As above described, the pick up brushes were applied for use with an ordinary power driven vacuum sweeper. In Fig. 6 is illustrated how a rubber tired wheel such as 113 can be mounted on a shaft 113s with a conventional bristle brush that may be driven by friction from the floor. This friction contact is maintained by an elongated bearing aperture for shaft 113s as is well understood in the art and a belt such as 16 provides the drive to the brushes 20 and 21. From the foregoing, it will be understood and appreciated that the pick up brushes may be applied to a conventional friction driven sweeper as well as a power driven sweeper.

Now referring to Fig. 4, I desire to explain the gist of my invention. The pick up brushes 20 and 21 are preferably equipped with comparatively thin resilient bristles. However, these brushes carry bristles over their entire length so that a great number of these resilient bristles are effective for use at all times circumferentially of the lengths of the brushes 20 and 21. Now observing the bristles in Fig. 4, it will be observed that the brushes are so spaced axially as to intermesh and mingle in intimate contact in their upward movement, the intermingling of the bristles in contact is distinctly upwardly between the brushes 20 and 21. Further, it will be carefully observed that there is a coacting resilient upward movement of the bristles at this point.

The efficient and dependable brush pick up action is obtained by virtue of the closely set brushes 20 and 21. This provides the basis for "bristle filling" the space at or near the surface being cleaned and between the brushes adjacent the surface side thereof causing hundreds of "bristle fingers" to intimately intermesh at the surface being cleaned to positively pick up and

move dirt and foreign objects off of the sweeper supporting surface. As the brushes function they actually snap release objects caught by the bristles as they pass over center upwardly of the horizontal axial disposition of the brushes. This particular relationship of the brushes 20 and 21 to each other and with respect to the floor or surface being cleaned is best illustrated in Figs. 2, 3 and 4.

This upwardly coacting contact of the bristles effectively picks up and carries upwardly all loose foreign particles and discharges them above the brushes and away from the surface of the carpet or other surface and into the natural air flow stream of a vacuum sweeper or into a dust pan in a hand operated sweeper. Now being deposited in this air stream, pick up materials are effectively carried along and discharged into the waste receptacle of the sweeper.

It may be explained that the surface level intermingling of the bristles of the closely set brushes 20 and 21 brings about this upward movement and discharge which is essential to effective pick up. Contrarywise, brush rolling horizontal movement of loose particles is not effective and leads to ineffective and bothersome action that is an exasperation to the user of most sweepers. It will be observed that this brush contact is a squeezing and intermeshing fingerlike pick up between bristles at the cleaning surface which acts to discharge the particles upwardly and into the natural air stream or pan of the sweeper. Further, it will be understood and appreciated that this contact is preferably adjustable. The lengths of the nap of the carpet and the surface of other floor coverings will have a decided effect upon the pick up. Therefore, the adjustment of the pick up brushes is also provided for in this sweeper. As I have heretofore explained, it is not always necessary to have the brushes in overly firm contact with the floor or carpeting and that it is advantageous to be able to release the brushes from too intimate a contact in order to reduce wear on the brushes particularly when used on high nap carpeting and so forth. Therefore, when the operator gets into a situation where she desires to better adjust the effective pick up she can move the pick up brushes toward floor contact to give the desired results.

Having thus explained my invention I now claim as new:

1. In a floor sweeper, a wheel supported casing, suction cleaning means connected with said casing, a floor sweeping brush mounted for rotation upon said casing, adjustably swingable brackets mounted upon said casing, latch means for adjustably positioning said brackets in given relations with respect to said casing, and coacting pick up bristle brushes mounted for rotation upon said brackets and extending therebetween, said brushes each having the peripheral bristle portions thereof terminating in a cylindrical contour with the brushes having their axes disposed in close proximity with respect to the floor acted upon by said brushes and also in close proximity to each other whereby said pick up brush bristles are tangentially maintained in flexed and dispersed engagement against such surface and also in intermeshed and intermingled relationship between the adjacent tangential portions of said pick up brushes, whereby said brush bristles fill the area between said floor and said pick up brushes, and drive mechanism carried by said casing and construc-

ted and arranged to drive said pick up brushes in opposite directions with respect to each other, said brushes so driven causing the bristles thereof to move over the floor contacted by said brushes with the bristles moving toward each other across said floor and away therefrom through the tangential bristle intersecting zone between said pick up brushes.

2. A sweeper pick up mechanism comprising at least two shafts, bristles carried by said shafts and extending outwardly therefrom to provide cylindrical brushes about said shafts, supporting means to rotatably carry said shafts in closely spaced relation with respect to each other with the bristles of the shafts deeply intermingling with each other in intimate intertwined relation within the common tangential zone located between said shafts, said supporting means further providing the instrumentality to maintain said shafts in close proximity with respect to the surface being cleaned by said sweeper whereby said bristles are collectively flexed into out-of-round brush formations while engaging the surface being cleaned, and drive means connected with said shafts to rotate the shafts oppositely causing relative movement of the shaft bristles toward each other over the surface being cleaned to successively intermingle the bristles of said shafts respectively, and mounting means to adjustably carry said shaft supporting means to bodily move both of said shafts toward or away from the surface being cleaned, said mounting means comprising a wheel supported housing, pivotal means to swingably carry said shaft supporting means on said housing, and cooperative mechanism interposed between said housing and shaft supporting means to hold the latter in a given relation with respect to said housing.

3. In a wheel supported sweeper housing, the combination of cooperative brush mechanisms comprising a first main sweeping brush supported for rotation on said housing and for tangential sweeping contact with a surface being cleaned, and a pair of bristle brushes with cylindrical contours disposed adjacent said first brush with both of the bristle brushes being arranged in depressed and out-of-round tangential contact against the surface being cleaned, a supporting means connected with said housing to bodily carry said pair of bristle brushes for rotation in closely spaced relation with the bristles of each one of said pair of brushes intimately intersecting the external zone of the bristle termini of the other of said pair of brushes in the common tangential region located between said brushes, said out-of-round and intersecting bristles filling the area between the surface being cleaned and said brushes, and drive means operably connected with said bristle brushes and constructed and arranged to cause opposite rotation of said pair of brushes to move the bristles of these brushes respectively toward each other through the bristle filled area adjacent the surface being cleaned and away therefrom between said pair of brushes.

4. In a wheel supported sweeper housing as set forth in claim 3, but in which said drive means has connection with said main sweeping brush, and including means operative to transmit driving power to said drive means.

5. In a sweeper, a casing, wheels to support said casing at a given distance above a surface to be cleaned, and a dual rotary pick up means adapted for generally tangentially sweeping engagement

with the surface to be cleaned, said means comprising at least two rotatable bristle carriers each having bristles radiating generally outwardly therefrom with respect to the axis of rotation thereof and terminating in a cylindrical peripheral contour, support means connected with said casing to position said carriers with their axes spaced and separated a distance less than the lengths of the bristles respectively of said carriers to deeply intermingle the bristles of said carriers within the tangential zone located between said two carriers, said supporting means being located and arranged in relation to said casing to position said carriers at such a distance from the surface to be cleaned so as to cause flexing and surface dispersion of said bristles against said surface and along the tangential zone of said carrier bristle portions located adjacent said surface, and actuating means connected with said carriers to rotate the carriers in opposite directions with respect to each other and to move the bristles of said carriers toward each other along the surface being cleaned and away from such surface through the zone between said carriers.

6. An auxiliary pick up mechanism for cooperative use in connection with a cleaning device normally employed in a given relation with respect to a surface being cleaned, said pick up mechanism comprising at least one pair of adjacently positioned rotatable cylindrical brushes, the brushes being arranged with respect to said device to occupy a tangential meeting position closer to each other than the length of their individual radii as measured from their axes to the terminal tips of their respective bristles, and both brushes simultaneously occupying positions against the surface being cleaned to dispose both brush axes closer to such surface than their radii as measured from their axes to the terminal tips of their respective bristles to flex and disperse such bristles in out-of-round tangential contact with the surface, and drive means connected with said brushes for rotating said brushes oppositely with respect to each other to move the bristles of said respective brushes toward each other beneath the brushes and over the surface being cleaned and to move said bristles of said brushes in intermingled relation upwardly and away from said surface to gather and move foreign materials to a median position on said surface between the brushes and to bodily lift and convey such materials generally upwardly through the common tangential region between said brushes respectively.

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