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M. I. SHEPS
SANDING APPARATUS

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2 Sheets-Sheet 2

Fig. 2.

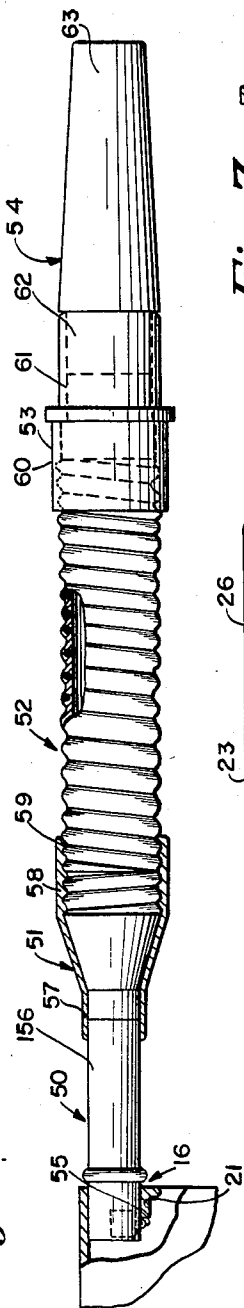


Fig. 7.

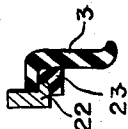


Fig. 3.

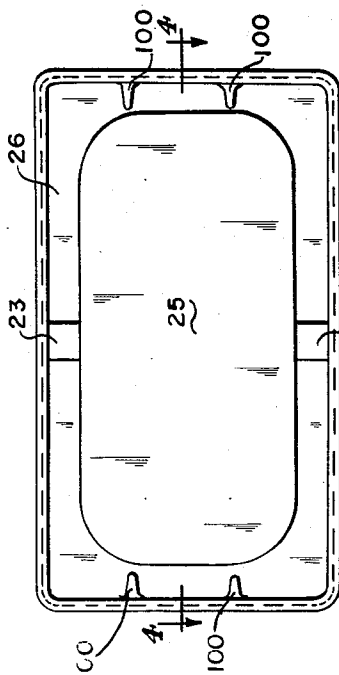


Fig. 5.

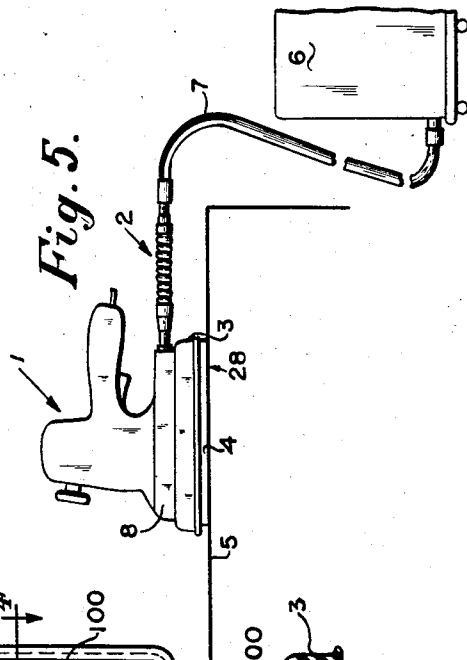
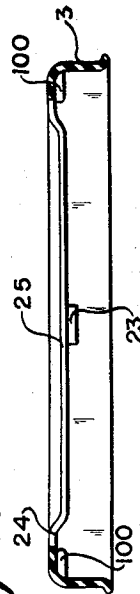


Fig. 4.



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SANDING APPARATUS

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9 Claims. (Cl. 51—273)

This invention relates to sanding machines and in particular to a dust collecting or removing attachment for a sanding machine.

Various types of sanding machines have heretofore been provided which incorporate some means for removing the dust created by the action of the sanding member from the surface of the article being sanded. The prior art devices are, however, subject to certain limitations. They do not provide for some simple expedient or expedients which may be attached to an ordinary sanding machine easily and which may be manufactured and therefore purchased either with or without the sanding machine itself. Furthermore, the prior art dust removing systems necessarily are expensive by virtue of their very nature.

Accordingly, it is an object of this invention to provide an attachment for a sanding apparatus having a sanding member, which attachment can be (a) cheaply manufactured, (b) purchased with or without the sanding machine itself, (c) easily installed on a sanding machine, and (d) used with an ordinary vacuum cleaner.

More specifically, it is an object of this invention to provide an attachment for a sanding apparatus having a sanding member, which attachment comprises the combination of a skirt adapted to be attached to the sanding apparatus whereby a zone surrounding the periphery of the sanding member is confined, and coupling means for connecting the zone with a source of vacuum whereby dust created by the action of the sanding member is caused to move away from the sanding member through the zone and to a source of vacuum when the zone is coupled with the source of vacuum.

One of the primary objects of this invention is to provide an attachment of the above-described type which may be used with an ordinary vacuum cleaner, whereby the action of the vacuum cleaner causes the sanding dust to be removed from the work area and collected in the vacuum cleaner dust bag.

Further and specific objects of this invention are to provide an attachment for a sanding machine comprising the combination of a skirt and a coupling means (1) wherein the skirt terminates above the working surface of the sanding member and spaced therefrom so as to facilitate sanding without interference from the attachment, (2) wherein at least part of the coupling means is flexible to allow for free and easy movement of the sanding machine relative to the source of vacuum with which the attachment is connected, (3) wherein the coupling means carries means for releasably securing the coupling means to the sanding machine so that the coupling means as well as the machine itself may be attached to and detached from a source of vacuum conveniently, (4) wherein the skirt may be made of a plastic material which facilitates manufacture of the skirt and reduces the cost of the attachment, and (5) wherein the coupling means comprises a plurality of joinable sections, one end section being adapted to engage the

housing of the sanding machine, and the other end section being adapted to engage vacuum cleaner hose connectors of various sizes so that any vacuum cleaner having a hose extending therefrom may be used with the attachment.

A still further specific object of this invention is to provide a complete sanding apparatus constructed in accordance with the teachings of this invention, which apparatus comprises a substantially hollow walled housing open at one end and having an aperture in one wall thereof, a sanding member mounted below the open end, a detachable skirt connected to the housing and surrounding the sanding member in spaced relation thereto whereby a passageway communicating with the aperture is formed between the skirt and the sanding member, and coupling means cooperating with the aperture for coupling the aperture and thereby the formed passageway with a source of vacuum so that dust created by the action of the sanding member travels through the passageway, at least part of the housing, the aperture, and the coupling means to the source of vacuum. In this regard, other specific objects of this invention are to provide a complete sanding apparatus, as immediately above-described, (1) wherein the housing has a peripheral flange adjacent the open wall and the skirt carries flexible members for attachment with the flange; and (2) wherein the coupling means is releasably secured to the housing and is adapted to cooperate with various size connectors on vacuum cleaner hoses.

In accordance with the above objects, this invention provides for an attachment which is particularly convenient to use with a portable sander of the type designed for home use. Of course, various other objects than those specifically set forth above will become apparent to those of ordinary skill in the art or even laymen when consideration is given to the following detail description of the exemplary embodiments of the invention. The exemplary embodiments are presented in the annexed drawings, wherein:

Figure 1 is a side view, partly in section, and partly in elevation, showing a portable sanding machine constructed in accordance with this invention and having part of the attachment consisting of a skirt and coupling means connected thereto;

Figure 2 is a side view, partly in section and partly in elevation of the coupling means provided by this invention;

Figure 3 is a plan view of the bottom of the skirt portion of the attachment shown in Figure 1;

Figure 4 is a cross-sectional view of the skirt provided by this invention and taken on line 4—4 of Figure 3;

Figure 5 is a side elevational view of a sanding machine provided in accordance with this invention and coupled to an ordinary vacuum cleaner;

Figure 6 is a side view of a plug which may be part of the attachment provided by this invention, and

Figure 7 is a cross-sectional view showing the means by which the skirt portion of the attachment is held onto the sander itself.

In the drawings, the numeral 1 generally designates a sanding machine which has a hollow housing 8 and which carries a coupling means 2 and a skirt 3. The coupling means 2 and skirt 3 comprise an attachment which is, according to the provisions of this invention, used for dust collecting purposes. So that the various aspects of the invention may be fully comprehended, attention should first be directed to Figure 5. In that figure, the sanding member 4 of the machine 1 is shown disposed on a surface 5 which is to be operated upon. Coupling means 2 is connected with a hose 7 extending from an ordinary vacuum cleaner 6. Assume for purposes of illustration that sanding member 4 is caused to

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move when the machine is connected to a source of electrical power. In this instance, the action of sanding member 4 will create dust. This dust is caused to move upwardly in the passageway formed between the skirt 3 and the sanding member 4, through part of housing 8, and through coupling means 2 and hose 7 to vacuum cleaner 6 when the vacuum cleaner is on. Thus, the attachment comprising the combination of skirt 3 and coupling means 2 is used as a dust collecting attachment.

Although the attachment provided by this invention is shown in the drawings as used with a sanding machine of the portable type, it should be apparent that an attachment of the type shown may be used with any sanding machine.

Having thus set forth the basic operation and general aspects of the attachment provided by this invention, attention will now be directed to exemplary structural details thereof.

In Figure 1, a motor 12 is shown disposed within the upper portion of casing 10. The casing 10 has two portions, an upper portion hereinafter referred to as housing 11 and a lower portion hereinafter referred to as housing 8. Casing 10 is, of course, an integral structure, and is referred to as comprising separate housings only because the construction of housing 8 is important with respect to this invention, whereas the construction of housing 11, in which the motor 12 is disposed, is not.

Motor 12, drives, through suitable gearing, the sanding member 4. In the particular construction shown, shaft 15 is offset with relation to shaft 14 and therefore sanding member 4 is eccentrically driven whereby it may be said to oscillate. The particular type of drive for the sanding member forms no part of this invention, and it should be understood that the attachment is shown in connection with an oscillating sander because an attachment for this type of sander may easily be used with any other kind of sander, whereas the reverse is not necessarily true.

The housing 8 is a substantially hollow housing having an open bottom wall. Sanding member 4 is disposed in parallel relation to and below the open wall. An aperture 16 is provided in wall 17 of the housing. In the preferred construction, the rear portion 20 of housing 8 is rectangular in configuration, and the aperture 16 is provided in the side wall. A flange 21, which preferably is of tubular configuration, extends inwardly from wall 17. Thus, aperture 16 may be said to be tubular in the preferred construction. With aperture 16, one end of coupling means 2 cooperates in a manner hereinafter referred to with particularity.

Around the edge of housing 8 adjacent the bottom open wall is a peripheral flange 22. This flange 22 cooperates with lugs 100 and tabs 23 to hold skirt 3 in position on the sanding machine. The tabs are flexible members having recesses 24 (Figure 7) adapted to engage the flange 22 and these tabs or flexible members 23 are secured to the skirt by any suitable means such as for example, by glue. Of course, the flexible members may be integral with skirt 3 when the skirt is made of a flexible material. The peak shaped lugs 100 which are also made of a flexible material frictionally engage flange 22 in a slight interference fit, so as to prevent movement of the skirt when in position. Preferably the lugs 100 are at either end of the skirt as shown in Figures 3 and 4 and are secured to the skirt in the same manner as the tabs 23. The tabs 23 and lugs 100 can be considered respectively as attaching members and positioning members regardless of the material from which they are made, and whether or not they are integral with the skirt.

The skirt 3 may be made of metal, Bakelite, or a like material, and the tabs and/or lugs only made of flexible material. The skirt 3 has an open top 25 (Figure 3) of a configuration corresponding to the shape of housing 8. Of course, the dimensions of the open top preferably correspond to the external dimensions of the housing 8 so that a tight fit is made.

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The skirt 3 as shown may be placed in position either by inserting it over the top of the machine, tilting it so as to pass the handle while so doing, or by stretching it over the flange 22 if made of a flexible material which will permit such.

As shown in Figure 3, four peak lugs 100 are provided at either end and two recessed flexible members 23 are provided on either side of the skirt to engage the flange 22 for holding the skirt on the machine. It should be understood though that any number of flexible members or lugs may be provided, and in fact, a complete flange may be provided inside of the skirt to cooperate with flange 22 for securing the skirt to the sander. Any arrangement for holding the skirt to the sander is within the comprehended scope of this invention.

When flexible members are used for securing the skirt to the sander, then the solid portion 26 of the top of the skirt should fit tight with the flange 22, or the edges of open portion 25 of the top of the skirt should engage housing 8. When, however, a full flange on the skirt is used, then the need for the tight fit of the top of the skirt with the housing 8 may be eliminated if the flange on the skirt serves to seal with flange 22 on the housing.

Although a flanged housing such as that designated by numeral 8 is preferred, it will be apparent that various other types of housings may be used and a skirt such as that designated by numeral 3 attached thereto. Possibly the most basic modification would be to provide a skirt having apertures through a top portion thereof, and a housing having threaded apertures cooperating with those on the skirt so that the skirt might be held in position by screws. The construction presented in the drawings, however, has many advantages including those of being particularly easy to place in position and easy to manufacture.

The skirt and/or the flexible members 23 and lugs 100 may be made of India-rubber, synthetic rubber, a plastic such as polyethylene, or of any other suitable material, and as pointed out above, the skirt may even be metal. However, the skirt 3 is preferably made of a plastic material.

It will be noted by reference to Figures 1 and 5 particularly that the lower portion 27 of the skirt 3 terminates slightly above the working surface 28 of the sanding member 4 and is spaced from the sanding member 4. The spacing is such as to allow for oscillation of the sanding member, and this space serves as a passageway communicating with aperture 16 through which, in a manner hereinafter described, the dust travels away from sanding member 4.

The housing 8, as above mentioned, is substantially hollow. Of course, as with any sanding machine, this housing carries a gearing arrangement on drive means, here generally designated by numeral 28 and certain sanding member supports such as those here designated by numeral 29. Since the housing is hollow there is space between components of the apparatus, and therefore the passageway or zone 30 formed between the skirt 3 and the sanding member 4 communicates with aperture 16 through at least part of housing 8.

It should be pointed out at this point that although a part of coupling means 2 is shown cooperating with aperture 16 in Figure 1, the coupling means may be removed and the aperture closed with a plug such as that shown in Figure 6. The plug comprises a cap 31 from which extends a plurality of spring-like fingers 32 which engage the sides of the tubular aperture 16 when the plug is inserted. The particular sander shown incorporates a sand paper gripping mechanism 150 at either end. These gripping mechanisms comprise a spring biased shaft carrying at least two knurled cylinders, but the type of sand paper clamp used only affects the invention in so far as the design of the skirt must be such as to not interfere therewith.

Attention should now be directed to Figure 2 wherein the coupling means is presented in detail. The coupling

means comprises a plurality of tubular sections 50, 51, 52, 53 and 54. Section 50 has a forward portion 55 of an external diameter corresponding to the internal diameter of aperture 16 whereby portion 55 may be inserted in the aperture. This portion carries a detent 56 which engages the edge of flange 21. The detent is spring biased in the same manner as conventional detents, and serves as a means to releasably secure the coupling means to the apparatus. Portion 56 of section 50 frictionally engages one end 57 of an adapter section 51. The other end 58 of adapter section 51 carries threads 59 which cooperate with and engage the peripheral threads on flexible hose section 52. Another adapter section 53 is provided.

The adapter section 53 has one end 60 which carries threads that cooperate with and engage the peripheral threads on the other end of flexible hose section 53. End 61 of adapter section 53 will frictionally engage, either externally or internally, some conventional vacuum cleaner hoses; however, because of the range of diameters which vacuum cleaner hoses may have, a further section 54 may be provided which has one end 62 adapted to frictionally engage end 61 of section 53 and another end 63 which is tapered or frusto-conical. End 63 being tapered will frictionally engage vacuum cleaner hoses of various sizes, or to state it another way, those having diameters within a predetermined range.

The sections of the coupling means 2 may be made of any suitable material, and of course, some sections may be combined into one. It is important, however, to note that one of the sections is preferably flexible to allow for freedom of movement of the sander. Also, it is an important aspect of the invention to provide a coupling means having one end adapted to engage various size vacuum cleaner hoses.

From the foregoing discussion it should be apparent that there is provided an attachment for a sanding apparatus having a sanding member, which attachment comprises the combination of a skirt 3 adapted to be attached to the apparatus 1 whereby a zone 30 surrounding the periphery of the sanding member is confined, and coupling means 2, at least part of which, section 52, is flexible, for connecting zone 30 with a source of vacuum whereby dust created by the action of the sanding member 4 is caused to move away from the sanding member 4 through the zone 30 and to the source of vacuum when the zone is coupled to the source of vacuum via coupling means 2.

After considering the foregoing description in conjunction with the annexed drawings, it is apparent that there is provided by this invention a device by which the various phases, objects, and advantages herein set forth, are successfully achieved. Modifications of this invention will become apparent to those of ordinary skill in the art after reading this disclosure.

Therefore, it is intended that the matter contained in the foregoing description and the accompanying drawings be interpreted as illustrative and not in a limiting sense, when consideration is given to the appended claims.

I claim:

1. An attachment for a sanding machine having a substantially hollow housing with one substantially open wall and with an aperture in one closed wall, and having a sanding member mounted outside of said housing and substantially parallel to said open wall of said housing, said housing having a radially extending circumferential flange adjacent said open wall; said attachment comprising the combination of a skirt carrying a plurality of attaching and positioning members, said attaching members having recesses adapted to receive said flange for removably securing said skirt to said housing, said attaching members and said positioning members being disposed to cooperate with said flange whereby said skirt extends from the open wall of said housing, surrounds said sanding member, terminates at least slightly above

the working surface of said sanding member, and is spaced from said sanding member, said skirt and said sanding member forming a passageway therebetween which communicates with said aperture through at least part of said skirt and part of said housing; and an at least substantially hollow coupling means having two ends, wherein one of said ends is adapted to cooperate with said aperture for connecting said housing and thereby said passageway with said coupling means, and wherein the other end of said coupling means is adapted to cooperate with a source of vacuum for connection therewith, whereby any vacuum created by said source is transmitted to said passageway so that dust caused by the action of said sanding member travels through said passageway, at least part of said skirt, part of said housing, and said coupling means to the vacuum source.

2. An attachment for a sanding machine as defined in claim 1 wherein said skirt is made of plastic material.

3. An attachment for a sanding machine as defined in claim 2 wherein said coupling means comprises a plurality of joinable hollow tubular sections, at least one of which is flexible, at least one of which sections has a portion of a diameter corresponding to the diameter of said aperture and carries means to retain that portion in said aperture, and at least one of which sections has a portion adapted to engage a hose extending from a source of vacuum such as a vacuum cleaner.

4. An attachment for a sanding machine as defined in claim 1 wherein said skirt is plastic and wherein said coupling means comprises a plurality of joinable hollow tubular sections, at least one of which sections is flexible, at least one of which sections has a portion with a diameter corresponding to the diameter of said aperture and carries means to retain that portion in said aperture and at least one of which sections has a portion adapted to engage a hose extending from a source of vacuum such as a vacuum cleaner.

5. An attachment for a sanding machine as defined in claim 1 wherein said coupling means comprises a plurality of joinable hollow tubular sections, at least one of which sections is flexible, at least one of which sections has a portion with a diameter corresponding to the diameter of said aperture and carries means to retain that portion in said aperture, and at least one of which sections has a tapered portion adapted to frictionally engage connectors of various diameters extending from a source of vacuum such as a vacuum cleaner.

6. An attachment for a sanding machine as defined in claim 1 wherein said combination further includes a removable closure for said aperture to be used when said coupling means is not connected with said housing.

7. A portable sanding machine comprising a substantially hollow walled housing open at one end and having a tubular aperture in one wall thereof, said housing also having a radially extending circumferential flange adjacent the open end; a sanding member mounted for oscillatory movement below said open end, a detachable skirt carrying a plurality of attaching and positioning members, said attaching members having recesses adapted to receive said flange for removably securing said skirt to said housing, said attaching members and said positioning members being disposed to cooperate with said flange whereby said skirt surrounds said sanding member, and terminates slightly above the working surface of said sanding member in spaced relation to said sanding member whereby a passageway communicating with said aperture is formed between said skirt and said sanding member, and coupling means coupled to said aperture and including a plurality of joined tubular sections, wherein the section at one end of said coupling means has a portion with a diameter corresponding to the diameter of said tubular aperture and is releasably secured in said aperture by means carried on that portion and wherein the section at the other end of said coupling means has a portion adapted to frictionally engage a hose extend-

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ing from a source of vacuum such as a vacuum cleaner.

8. A portable sanding machine as defined in claim 7 wherein said portion adapted to frictionally engage a vacuum cleaner hose is tapered whereby it is adapted to engage the coupling on a hose extending from a source of vacuum having a diameter within a predetermined range of diameters.

9. A portable sanding machine as defined in claim 7 wherein said skirt has a top flange adapted to engage said circumferential flange on said housing, and wherein said attaching members having recesses therein are disposed on the underside of said top flange.

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