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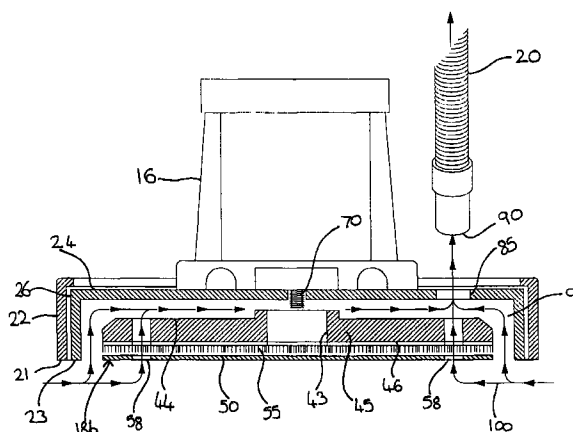
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(54) **Attachment for a floor maintenance machine**

(57) The present invention relates to vacuum floor treatment and maintenance machines equipped with rotating sanding or brushing work heads. According to the present invention there is provided an attachment for a floor maintenance machine for use in dry operations comprising a first portion for contacting the floor in use, the first portion having one or more apertures extending therethrough, the first portion being attachable to a floor maintenance machine so that reduction of the air pressure above the first portion during operation of the maintenance machine enables air and particles entrained therein to be drawn through the one or more apertures in the first portion. Preferably a cover portion is attachable to the floor maintenance machine so that the cover portion extends over the first portion and is spaced axially therefrom to define a passageway, the passageway extending between the cover portion and the first portion so that reduction of the air pressure above the first portion during operation of the maintenance machine in use enables air and particles entrained therein to be drawn through the passageway.

FIG. 3



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Description

[0001] The present invention relates to vacuum floor treatment and maintenance machines equipped with rotating sanding or brushing heads.

[0002] Conventional floor maintenance machines which may be used for polishing or sanding a floor generally include a rotating head which is in contact with the floor and may carry, for example, bristles, an abrasive surface, wire brushes, or polishing pads depending on the surface to be treated and the type of treatment to be applied.

[0003] During a polishing operation, dust is generally created and the higher the speed of the polishing machine, the more likelihood there is of creating dust. Similarly, in the process of wood sanding, both dust and sawdust are created. It is known therefore to apply a vacuum attachment to remove dust from the region of the rotating head during operation.

[0004] In use, the rotating head in conventional floor maintenance machines generally causes dirt and debris to be thrown outwards on rotation of the disc. The dust and debris may be collected by means of a suction hose connected to a vacuum unit.

[0005] In the context of wood sanding, a sanding attachment head is connected to the floor maintenance machine, the sanding attachment head having a drive disc and a sanding disc attached thereto, the sanding disc contacting the floor surface in use. A vacuum attachment is generally applied to the stick of the floor maintenance machine and a suction hose is connected between the vacuum attachment and a cover of the sanding attachment head. A separate floating ring which extends around the periphery of the sanding attachment head acts to hold the dust within the attachment head and, as the sanding attachment rotates, the dust is collected using the suction hose.

[0006] In the conventional drive discs of wood sanding attachment heads the sawdust generated during the sanding operation will collect at the periphery of the sanding disc. The floating ring permits low pressure chamber to develop at the periphery of the disc so that the sawdust is lifted up and carried to the vacuum device.

[0007] One problem with such arrangements is the fouling of the treatment surface with dust, to the detriment of the treatment capability. For example the sand paper of a sanding disc may become clogged with sawdust which is compacted onto the rotating sanding disc as the sawdust is shaved from the floor surface.

[0008] The present invention aims to substantially overcome or ameliorate the above-mentioned disadvantage.

[0009] According to the present invention there is provided an attachment for a floor maintenance machine for use in dry operations comprising a first portion for contacting the floor in use, the first portion having one or more apertures extending therethrough, the first portion

being attachable to a floor maintenance machine so that reduction of the air pressure above the first portion during operation of the maintenance machine enables air and particles entrained therein to be drawn through the one or more apertures in the first portion.

[0010] Preferably a cover portion is attachable to the floor maintenance machine so that the cover portion extends over the first portion and is spaced axially therefrom to define a passageway, the passageway extending between the cover portion and the first portion so that reduction of the air pressure above the first portion during operation of the maintenance machine in use enables air and particles entrained therein to be drawn through the passageway.

[0011] The attachment may comprise a brush for polishing a floor.

[0012] In a further preferred embodiment, the attachment further comprises a second portion, the second portion having one or more apertures extending there-through, the second portion being attachable to the first portion so that the one or more apertures in the second portion overlap the one or more apertures in the first portion enabling air and particles entrained therein to be drawn through the one or more apertures in the first and second portions.

[0013] In the preferred embodiment in which the attachment further comprises a second portion, the attachment may comprise a disc for sanding a floor, a floor pad, a scarifying wire brush, or a carborundum stone or stones. In this preferred embodiment, the cover portion extends over the second portion and is spaced axially therefrom so that a passageway is formed between the cover portion and the second portion so that reduction of the air pressure above the second portion during operation of the floor maintenance machine enables air and particles entrained therein to be drawn along the passageway.

[0014] Preferably the cover portion has outlet aperture to allow egress of air and particles entrained therein after passing through the apertures in the second and/or first portions and the passageway.

[0015] Embodiments of the invention will now be described by way of example and with reference to the accompanying drawings, in which:

Figure 1 is a parts exploded view of a conventional floor maintenance machine excluding the attachment maintenance head;

Figure 2a is a projection of an attachment to the floor maintenance machine of Figure 1 comprising a polishing brush;

Figure 2b is a parts exploded view of an alternative attachment to the floor maintenance machine of Figure 1 comprising a sanding disc;

Figure 2c is a parts exploded view of a further alter-

native attachment to the floor maintenance machine of Figure 1 comprising a floor pad; and

Figure 3 is a schematic sectional elevation through the line III-III in Figure 1 with the attachment of Figure 2b fitted.

[0016] Figure 1 shows a floor maintenance machine 10 comprising a control handle 12, a vacuum unit 14, a motor unit 16 and a suction hose 20. The control handle 12 extends upwardly from the motor unit 16 to a height convenient to the operator for holding and is hinged to the motor unit 16. The vacuum unit 14 is mounted on the control handle 12 above the motor unit 16. A drive assembly 27 having a peripheral housing is attached to the underside of the motor unit 16. The vacuum hose 20 extends from the vacuum unit 14 to the drive assembly 27. The drive assembly 27 comprises an annular flange portion 24 from which a peripheral skirt portion 26 depends. A floating vacuum ring 22 comprising an annular band sits over the depending skirt portion 26 and extends around the skirt portion such that in use the lower rims 21 and 23 of the depending skirt portion 26 and floating vacuum ring 22 respectively rest on the floor to prevent dust from being thrown outwards on rotation of the attachment head. The floating vacuum ring 22 is concentrically mounted with the drive assembly 27, as shown in Figure 3.

[0017] A number of alternative attachments are shown in Figures 2a to 2c. Figure 2a shows a polishing brush attachment 18a comprising a plate 30 having a substantially circular periphery. The plate 30 has an upper surface 32 and a lower surface 34. A plurality of bristles extend from the lower surface 34 of the plate 30 and the free ends of the bristles 36 contact the floor in use.

[0018] Attached to the upper surface 32 of the plate 30 is an upwardly extending ridge 38 to assist in location of the plate 30 in the drive assembly 17. The ridge 38 has a substantially circular periphery with a diameter less than the diameter of the plate 30.

[0019] A central bore 40 extends through the plate 30 and is concentric therewith. The peripheral wall 42 of the plate 30 defining the central bore 40 is shaped to engage with a corresponding member in the drive assembly 27 to retain the plate 30 on the drive assembly 27.

[0020] A plurality of apertures 31 extend from the upper surface 32 of the plate 30 to the lower surface 34. The apertures 31 are located around the circumference of a hypothetical circle concentric with the central bore 40 and plate 30, the diameter of the hypothetical circle being less than the diameter of the ridge 38.

[0021] An alternative attachment 18b is shown in Figures 2b and 3 in the form of a sanding disc 50. The attachment 18b shown in Figures 2b and 3 comprises a plate 45 identical to the plate 30 of the attachment 18a shown in Figure 2a with the exception that the lower surface 46 of the plate 45 in the second embodiment does

not include a plurality of bristles extending therefrom. In the attachment shown in Figures 2b and 3, an annular drive disc 52 is attachable to the lower surface 46 of the plate 45. The drive disc 52 has a plurality of apertures 54 which extend from the upper surface 55 of the drive disc 52 to the lower surface of the drive disc. The apertures 54 are spaced from each other around the circumference of a hypothetical circle concentric with the drive disc 52. A central throughbore 56 extends through the drive disc 52 and is located concentrically therewith.

[0022] A sanding disc 50 which is attachable to the drive disc 52 has a plurality of apertures 58 which match the apertures 54 in the drive disc 52, and a central throughbore 59 which matches the central throughbore 56 in the drive disc 52. The diameter of the sanding disc 50 is substantially equal to the diameter of the drive disc 52.

[0023] In the assembled state, the drive disc 52 is sandwiched between the lower surface 46 of the plate 45 and the upper surface 60 of the sanding disc 50 such that the apertures 54, 58 and 31 in the drive disc 52, the sanding disc 50 and the plate 45 are aligned.

[0024] As shown in Figure 3, a drive shaft 70 which is attached to the output shaft of the motor (not shown) in the motor unit 16, extends from the drive assembly 27 and through the central bore 42 in the plate 45 and the drive shaft 70 is secured to the plate 45.

[0025] Figure 2c shows a further alternative attachment 18c which is identical to the attachment 18b shown in Figure 2b except the sanding disc 50 is replaced by a floor pad 80. The floor pad 80 has a plurality of apertures 82 extending therethrough. The apertures 82 correspond to the apertures in the drive disc 52 such that when the floor pad is attached to the drive disc and plate 45 the apertures through the three elements are aligned. The peripheral shape of the floor pad 80 matches the peripheral shape of the drive disc 52.

[0026] The cover portion 27 has an outlet aperture 85 extending through the flange portion 24 and the free end 90 of the suction hose 20 may be attached to the cover portion 24 over the aperture 85.

[0027] As shown in Figure 3, the cover portion 27 is spaced axially from the attachment 18b to define a passageway 91 which extends around the periphery of the attachment 18b and above the upper surface 44 of the plate 45.

[0028] In operation, the attachment 18a to 18c rotates within the floating vacuum ring 22 once driven by the motor unit 16. The undersurface of the attachment, whether that be the bristles 36 of the attachment shown in Figure 2a, the sanding disc 50 of the attachment shown in Figure 2b or the floor pad of the attachment shown in Figure 2c, acts on the floor to polish or abrade the floor as appropriate. Debris generated thereby is extracted from around the periphery of the attachment 18a-18c and are drawn through the aligned apertures 31, 54, 58, 82 by the vacuum unit 14 when a reduction in air pressure above the attachment is generated. Air

and debris entrained therein are also drawn through the passageway 91 on reduction of the air pressure above the attachment 18a-18c. The arrows 100 shown in the figures illustrate the air flow paths through the attachments 18a-18c. The air and debris entrained therein are drawn through the vacuum hose 20 into the vacuum unit 14 for collection therein.

[0029] As the vacuum attachment comprising the vacuum unit 14 and suction hose 20 evacuates the passageway 91 around the periphery of the attachment, dust and debris are drawn through the apertures 31, 54, 58, 82 in the attachment 18a-18c, thus, dirt and debris may be removed from the floor during operation of the floor maintenance machine.

[0030] In a preferred embodiment, the apertures in the plates 30 and 45, and the corresponding apertures 54, 58 and 82 have a diameter of around 1 inch.

[0031] Various alternatives to the embodiments described will be evident to those skilled in art. For example, the number of cylindrical apertures in the plates 30 and 45 and discs 52, 50, 80 may be varied, as may be their shape and size.

[0032] Also, the nature of the attachment may be varied, for example, whilst floor maintenance heads comprising sanding discs, brushes, and floor pads have been described, these are given by way of example only and it will be appreciated that other attachments could be used such as scarifying wire brushes or carborundum stones.

Claims

1. An attachment for a floor maintenance machine for use in dry operations comprising a first portion for contacting the floor in use, the first portion having one or more apertures extending therethrough, the first portion being attachable to a floor maintenance machine so that reduction of the air pressure above the first portion during operation of the floor maintenance machine enables air and particles entrained therein to be drawn through one or more of the apertures in the first portion.
2. An attachment according to Claim 1, further comprising a cover portion, the cover portion being attachable to a floor maintenance machine so that the cover portion extends over the first portion and is spaced axially therefrom to define a passageway, the passageway extending between said cover portion and said first portion so that reduction of the air pressure above the first portion during operation of the maintenance machine in use enables air and particles entrained therein to be drawn through the passageway.
3. An attachment according to any preceding claim wherein the attachment comprises a brush for polishing a floor.
4. An attachment according to Claim 1, further comprising a second portion, the second portion having one or more apertures extending therethrough, the second portion being attachable to the first portion so that the one or more apertures in the second portion overlap the one or more apertures in the first portion enabling air and particles entrained therein to be drawn through the one or more apertures in the first and second portions.
5. An attachment according to Claim 4, wherein the attachment comprises a disc for sanding a floor.
6. An attachment according to Claim 4, wherein the attachment comprises a floor pad.
7. An attachment according to any one of Claims 4 to 6, further comprising a cover portion, the cover portion being attachable to a floor maintenance machine so that the cover portion extends over the second portion and is spaced axially therefrom to define a passageway, the passageway extending between the cover portion and the second portion so that reduction of the air pressure above the second portion during operation of the floor maintenance machine in use enables air and particles entrained therein to be drawn through the passageway.
8. An attachment according to Claim 2 or Claim 7, wherein the cover portion has an outlet aperture extending therethrough to allow egress of air and particles entrained therein after passing through the one or more apertures in the second and/or first portion and the passageway.
9. A floor treatment machine provided with an attachment as claimed in any preceding claim.

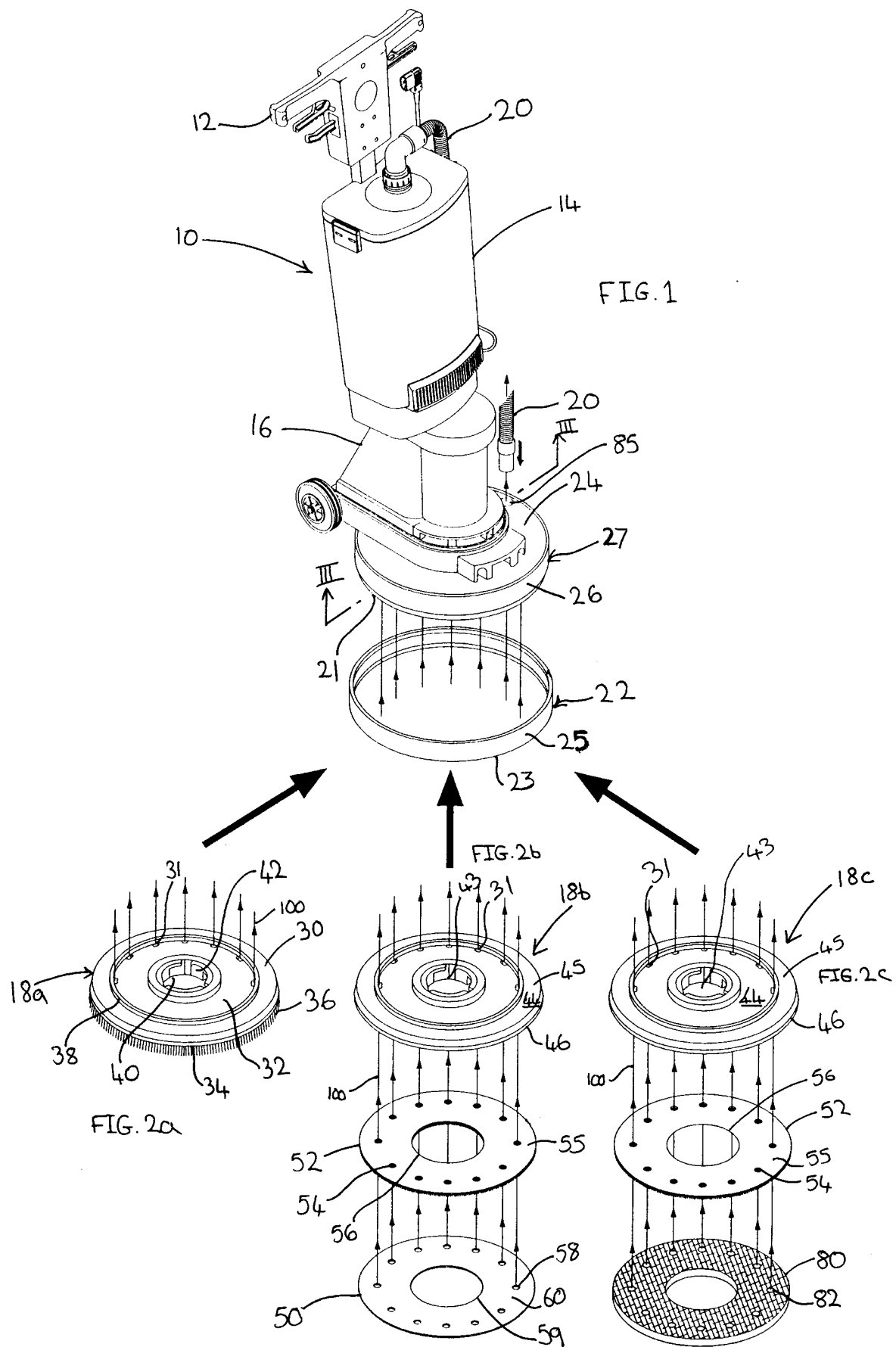


FIG. 3

