Dec. 11, 1956 A. DE MARCHI 2,773,337

GRINDING DEVICE

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FIG. 1

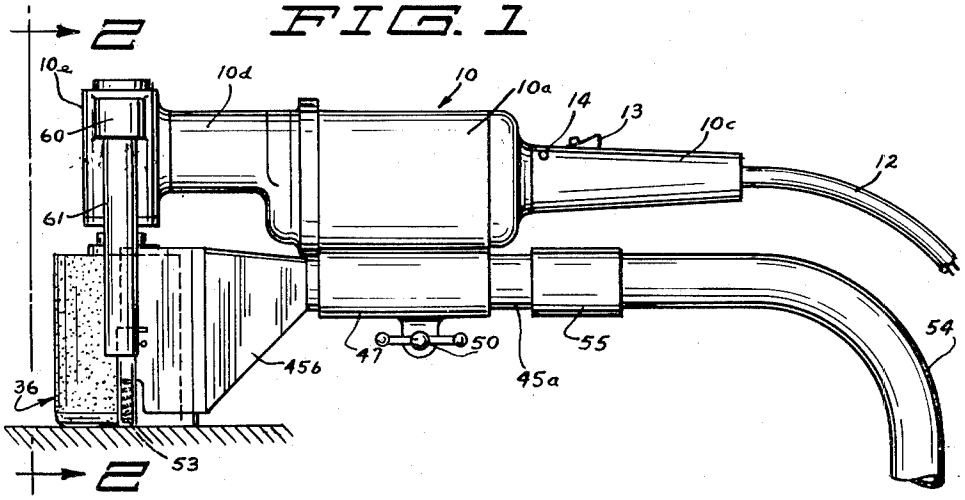


FIG. 2

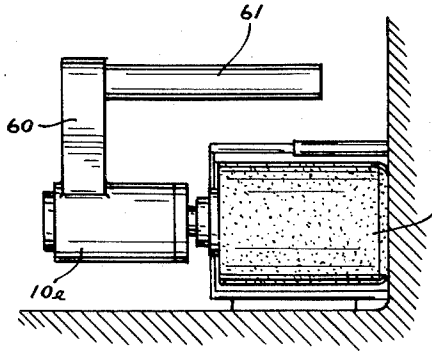
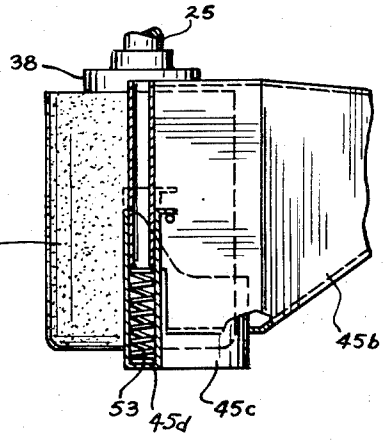


FIG. 5



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FIG. 3

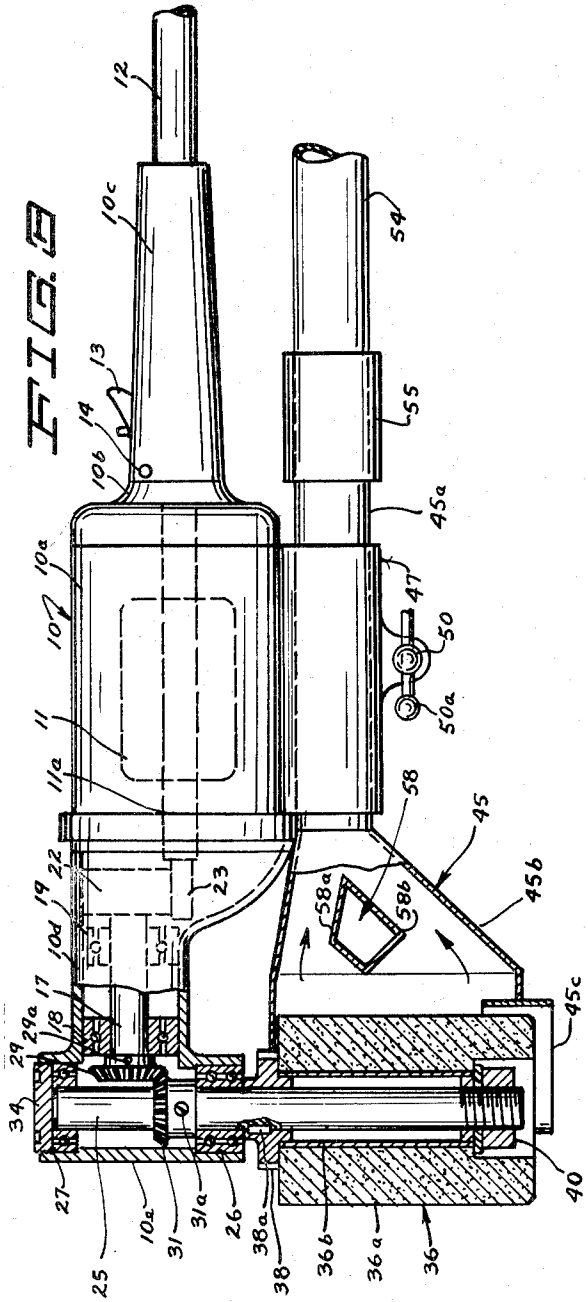
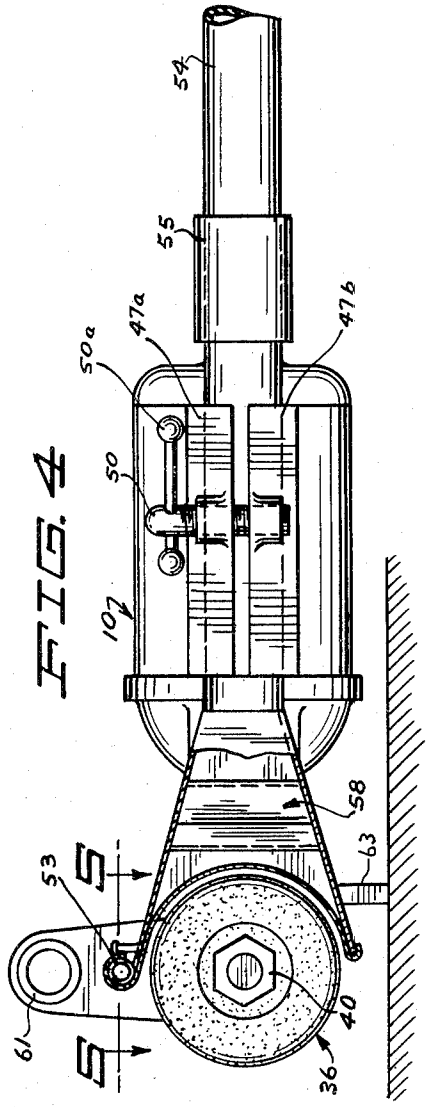


FIG. 4



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GRINDING DEVICE

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3 Claims. (Cl. 51—176)

This invention relates to an improved grinding device for grinding and polishing a surface, such as a floor surface of terrazzo. This invention relates particularly to dry grinding such a surface. The applicant believes that there is no dry grinding device available for use at the present time which effectively carries away by suction all of the dust created by the grinding operation. The raising and spreading of dust as a result of the grinding operation is particularly damaging in doing interior work and it is timeconsuming and costly to clean up said dust. In an effort to avoid creating and spreading dust a wet grinding device is generally used, but this type of grinding is inconvenient to handle by the operators and this is a more costly operation than would be a dry grinding method of operation.

It is therefore an object of this invention to provide a dry type of surface grinding device which is adapted to carry away by suction all of the dust which is created and raised by the grinding operation.

It is another object of this invention to provide a dry type of surface grinding device comprising a grinding member, a hood overlying a substantial portion of said member, a conduit having suction therein connected to said hood to draw air currents therethrough, and means in said hood for directing air currents to carry away all of the dust created by the grinding operation and particularly concentrating such air currents at the end portions of said grinding device to prevent the escape of any dust at said ends.

It is a further object of this invention to provide a type of surface grinding device comprising a grinding member, a hood overlying a substantial portion of said member and extending beyond the ends thereof, a conduit having suction therein connected to said hood for drawing air currents therethrough, and means in said hood for directed air currents to act at the end portions of said member.

It is a more specific object of this invention to provide a dry type of surface grinder comprising a housing having a motor therein, a grinding member adjacent said housing, a shaft having said grinding member secured thereto and being driven by said motor, a hood carried by said housing overlying a substantial portion of said grinding member and extending beyond the ends thereof, a conduit having suction therein connected to said hood to draw air currents therethrough, and a baffle in said hood to direct said air currents to cause strong air currents into said hood adjacent the end portions of said grinding member.

With reference to the structure set forth in the preceding paragraph, it is also an object of this invention to provide a slidable spring repelled portion at one end of said hood whereby under pressure said portion may be moved inwardly to uncover an end portion of said grinding member whereby said grinding member can be positioned directly adjacent a vertical wall or adjacent a riser, as on a stairway.

These and other objects and advantages of the invention will be fully set forth in the following description made in connection with the accompanying drawings in which

like reference characters refer to similar parts throughout the several views and in which:

Fig. 1 is a top plan view of applicant's device showing some portions in dotted lines;

Fig. 2 is a view in front elevation taken on line 2—2 of Fig. 1, as indicated by the arrows;

Fig. 3 is a top plan view with a portion broken away and some parts shown in dotted lines;

Fig. 4 is a view in side elevation; and

Fig. 5 is a partial view in horizontal section taken on line 5—5 of Fig. 4, as indicated by the arrows.

Referring to the drawings, and particularly to Figs. 1 and 3, a housing **10** is shown having a central body portion **10***a*. Said portion **10***a* is here illustrated as being generally cylindrical in form and is preferably made of a sheet metal material. Said housing **10** has a rear end portion of reduced diameter flared outwardly to form a flange **10***b*. Secured to said flange and extending outwardly therefrom is a tapering sleeve **10***c* of substantial length. Said sleeve will be made preferably of a rigid material, such as sheet metal, and forms a rear handle for holding applicant's device. Said housing **10** has a forwardly extending cylindrical portion **10***d* of reduced diameter. Said portion **10***d* has secured to its outer end a cylindrical portion **10***e* extending at right angles thereto.

Mounted in portion **10***a* is a motor **11** and the same is preferably an electrical motor. Said motor has a drive shaft **11***a* which extends for some distance into portion **10***d*. A conduit **12** is shown which will be disposed through portion **10***c* and connected at one end to said motor to provide current for its operation. Said conduit **12** will be connected at its other end to a suitable source of electrical energy. A switch **13** is secured in said portion **10***c* by a screw **14**, and said switch will control the flow of power from said conduit **12** to said motor **11**.

Mounted in portion **10***d* is a shaft **17** journaled in cage type of ball bearings **18** and **19**. The inner end of said shaft **17** has secured thereto a spur gear **22** which is driven by a gear **23** secured to said end portion of said shaft **11***a*. Said last two mentioned gears are of well known construction and are here shown only in dotted lines. Disposed in portion **10***e* and extending outwardly at one end therefrom for some distance is a shaft **25**. Said shaft is journaled in bearings **26** and **27** carried in the end portions of said portion **10***e*. Said bearing **26** is shown as comprising a double cage type of bearing and member **27** is shown as comprising a single cage type of bearing. A beveled gear **29** is secured to the outer end of said shaft **17** by a pin **29***a*. A beveled gear **31** is secured to shaft **25** by a pin **31***a* and is engaged and driven by said gear **29**. A cap screw **34** is threaded into one end of said portion **10***e* to close said end. A grinding member **36** is carried on the extended end portion of said shaft **25**. This is a standard type of a grinding member here shown as being cylindrical in form and having an outer portion **36***a* which may be formed of carborundum, and it is shown here as having an inner sleeve **36***b* which may be formed of any suitable material, such as sheet metal. The inner end of said member **36** is provided with a collar **38** having a bore of substantially the same diameter as that of said member **25** and is secured to said member **25** by a locking member **38***a*. Said member **36** extends outwardly of said shaft **25** for a short distance and is secured thereto adjacent its outer end by a nut **40** which is threaded onto the end portion of said shaft **25**.

A conduit **45** is provided having an elongated tubular portion **45***a* carried by said housing **10** and secured thereto by a tube clamp **47**. Said tube clamp is integral with said housing **10** and may be secured thereto in any suitable manner, such as by welding. Said tube clamp comprises and upper portion **47***a* and a lower portion **47***b*. Said member **47** is bored to have a diameter somewhat

less than the outside diameter of portion 45*a*. A screw 50 is threaded into the outer side portions of members 47*a* and 47*b* and a sliding bar 50*a* is slidable through the top portion of said screw 50 and will be turned to draw said portions 47*a* and 47*b* to tighten them about said portion 45*a*. Extending forwardly of said portion 45*a* is a portion 45*b* which is widened to form a hood to extend substantially the full length of said member 36 and being just short of the outer end thereof. Said portion 45*b* is substantially V-shaped in vertical section and overlies a substantial portion of the width of said member 36 and is here shown overlying substantially one-half the width of said member 36. If desired, said hood may be arranged to cover a greater portion of said grinding member 36. Carried by said portion 45*b* at the outer end of said member 36 is a portion 45*c* forming an extension of said portion 45*b* and extending beyond the end of said member 36 for some distance. Said member 45*b* has its upper and lower ends reversely curved. The upper curved end portion is recessed somewhat, as shown in Fig. 5. Said portion 45*c* has its upper and lower ends reversely curved about said curved portions of portion 45*b* to be movable longitudinally thereof. Secured in the upper curved portion of portion 45*c* is a coiled spring 53. One end portion of said spring 53 will bear against the inner end of said upper recessed curved end portion of member 45, and its other end will bear against the outer end of the upper curved portion of member 45*c*. Said outer end will have a flange 45*d* to form a stop for said spring. When portion 45c is moved inwardly, said spring will be compressed and when pressure against member 45*c* is removed, said spring will move said portion 45*c* outwardly. Normally, portion 45*c* will extend for a short distance over the end of member 36. Connected to the rear end portion of member 45 is a conduit 54 and said conduit is here disclosed as being made of flexible material and will be preferably connected to a dust collector (not shown). Said member 54 is secured to portion 45*a* by a collar 55. Said dust collector not here shown will be provided with means for creating suction in said conduit 54 and therethrough in hood 45. Such dust colllectors are not well known in the art and it is believed need no further description or illustration.

Disposed centrally in said portion 45*b* is a baffle member 58. Said baffle member is here shown as being somewhat diamond-shaped in horizontal section and it extends from the bottom to the top portion of said member 45*b* and is secured thereto in any suitable manner, such as by welding. The rear sides 58*a* and 58*b* of said member 58 are substantially parallel to the sides of said portion 45*b*. The rearward portion of said baffle 58 is somewhat longer than its front portion.

Secured to said portion 10*e* and upstanding for some distance therefrom is a member 60 and it may be secured to said member 10*e* in any suitable manner, as by welding. A handle 61 is provided having one end portion secured to member 60 and extending longitudinally for some distance along the outer end portion of said shaft 25. Secured to the under sides of said hood 45*b* and portion 10*d* are supporting members 63. Said members 63 will raise upwardly somewhat the outer end portion of applicant's device when it is not in use and is placed in a horizontal position.

In operation, applicant's device will be held by having the operator place one hand about handle 61 and the other hand about handle portion 10*c*. Conduit 12 will be connected to a source of electrical current. Conduit 54 will normally be connected to a dust collector having therein means for creating suction in conduit 54 and therethrough in said hood 45*b*. Said switch 13 is easily reached by the operator for controlling motor 11, which motor drives shafts 17 and 25 and griding wheel 36. In grinding and polishing a terrazzo surface the operator will place grinding wheel 36 against said surface and turn on switch 13 to operate motor 11. At the same time said means in said dust collector will be turned on to create suction in member 45 and withdraw dust created by the grinding process through hood 45*b* and conduit 54. Said hood 45*b* extends over the outer edge portions of grinding member 36, and as here shown extends over one-half of its width. Disposed within member 45, is a baffle 58 designed to direct the indrawn air currentes to particularly concentrate and intensify them at the outer sides of portion 45*c* and at the outer edge portions of said member 36. It has been found in practice that a substantial portion of the dust raised from the grinding process is raised at the outer edge portions of the grinding member and it is found in actual practice that the outer that the outer edge portions of said grinding member are in use more of the time than the central portion thereof. A substantial amount of the dust raised from the grinding process has been found to escape at the edge portions of the grinding member. Applicant's hood and the baffle within it are particularly designed and adapted to be most effective in withdrawing and capturing all of the dust at the edge portions of said grinding member 36.

In grinding a horizontal surface adjacent a vertical wall or in grinding a step on a stairway adjacent a riser, said grinding wheel 36 can be placed directly against the vertical surface and pressure against said vertical surface will push member 45*c* inwardly against spring 53 to expose the end portion of said grinding member 36 to permit grinding and polishing of the horizontal surface directly up to the vertical surface. When applicant's device is moved away from said vertical surface, said spring 53 will return said member 45*c* to its normal position extending over the end portion of member 36. When applicant's device is not in use it may be rested on supporting member 63 and the rearward portion of said device. Said supporting members 63 are of sufficient height to raise said grinding member 36 above the surface upon which said device is resting.

Thus it is seen that I have provided a compact grinding device easily handled by a single operator and adapted to completely carry away all of the dust raised in a dry grinding process of grinding and polishing terrazzo. Applicant's device is particularly effective in preventing the escape of any dust at the edge portions of the grinding member. Applicant's device has been thoroughly tested and found to be very efficient in operation and very effective in capturing and carrying away all the dust raised in the grinding operation.

It will of course be understood that various changes may be made in the form, details, arrangement and proportions of the parts, without departing from the scope of applicant's invention, which, generally stated, consists in a device capable of carrying out the objects above set forth, in the parts and combinations of parts disclosed and defined in the appended claims.

What is claimed is:

1. A portable grinding device for polishing a terrazzo surface having in combination, a housing, an elongated cylindrical grinding member carried at one end of said housing and extending in a direction at right angles to the axis thereof, a conduit in which suction is created having a portion clamped to said housing, a hood connected to said conduit adjacent said housing and substantially V-shaped in vertical longitudinal section and having sides diverging to a width substantially the width of said grinding member and then having portions extending in the direction of said grinding member at right angles to the axis thereof, said hood extending above and below said grinding member for some distance thereacross, a baffle member substantially diamond-shaped in form positioned centrally transversely in said hood and extending the full height thereof, said baffle member being adjacent said grinding member in operating position and having its sides remote from said grinding member parallel to the diverging sides of said hood and forming channels therewith, whereby said hood withdraws dust

the full width of said grinding member and said channels direct indrawn currents of air to be particularly intensified at the end portions of said grinding member.

2. A portable grinding device for polishing a terrazzo surface having in combination, a housing, an elongated cylindrical grinding member carried at one end of said housing and extending in a direction at right angles to the axis of said housing, means carried in said housing for operating said grinding member and means connecting said last mentioned means to a source of power, a conduit in which suction is produced having a portion adjacent the central portion of said housing and being removably secured thereto, a hood connected to said conduit, said hood being substantially V-shaped in vertical longitudinal section and having side walls diverging from said conduit in the direction of said grinding member to a width substantially the width of said grinding member and having portions extending above and below said grinding member for some distance thereacross, a baffle member substantially diamond-shaped in plan disposed substantially centrally transversely of said hood and extending the full height thereof and being positioned to be substantially adjacent said grinding member when in operating position, the sides of said baffle member remote from the outer end of said hood being respectively parallel to the diverging sides of said hood forming channels therewith, whereby in operation said hood will draw in dust the full width of said grinding wheel and said channels will concentrate and intensify the indrawn currents of air adjacent the ends of said grinding member.

3. A portable grinding device for polishing a terrazzo surface having in combination, a housing having a central portion generally cylindrical in form having a rear end portion of substantially reduced diameter tapering to form a handle and having a front end portion of reduced transverse dimension, an elongated cylindrical grinding member mouted on said front end portion and extending in a direction at right angles to the axis of said housing, a handle secured at one end to said front end portion of

said housing and having its other end extend over and being spaced above said grinding member, means in said housing for rotating said grinding member, and means connecting said last mentioned means to a source of power, a conduit in which suction is produced having a portion longitudinally of and adjacent the central portion of said housing, a clamping member securing said conduit to said housing, a hood having one end connected to an end of said conduit, said hood being V-shaped in vertical longitudinal section and having sides diverging to a width substantially the width of said grinding member, said sides having portions extending at right angles to the axis of said grinding member and said hood having portions extending above and below said grinding member for some distance thereacross substantially the full width thereof, a baffle member substantially diamond-shaped in plan disposed substantially centrally transversely of said hood and extending the full height thereof, said baffle member being positioned to be adjacent said grinding member when in operating position and having its sides remote from said grinding member parallel to the diverging sides of said hood forming channels therewith, whereby in operation said hood is adapted to draw in dust the full width of said grinding member and said channels direct the indrawn air to intensify it at the ends of said grinding member to draw in substantially all of the dust raised by the operation of said grinding member.

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