May 2, 1939. J. D. TORO ET AL 2,156,824

FLOOR POLISHING AND SANDING DEVICE

Filed Aug. 13, 1938 2 Sheets-Sheet 1

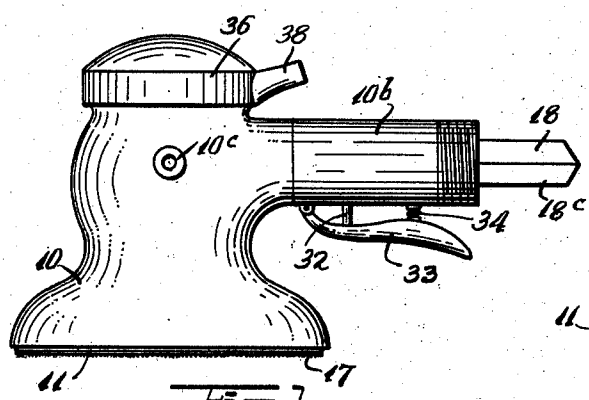


Fig. 1.

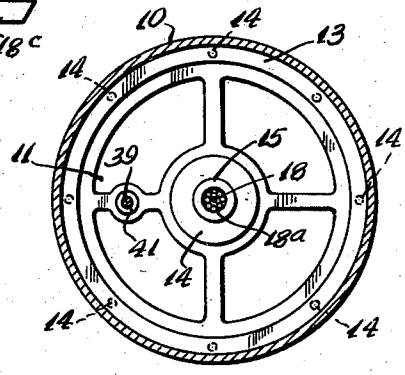


Fig. 5.

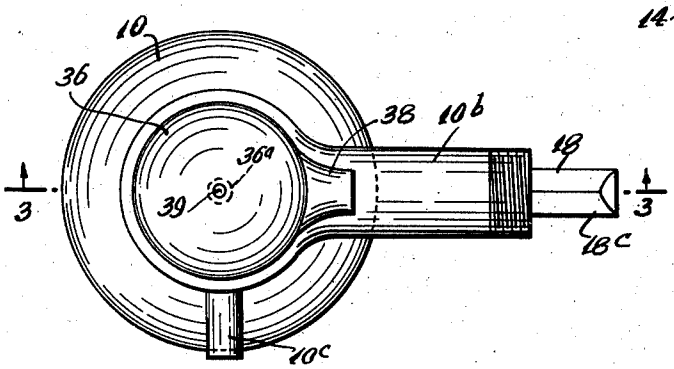


Fig. 2.

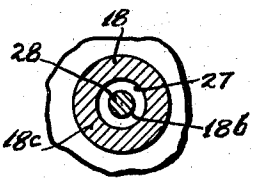


Fig. 4.

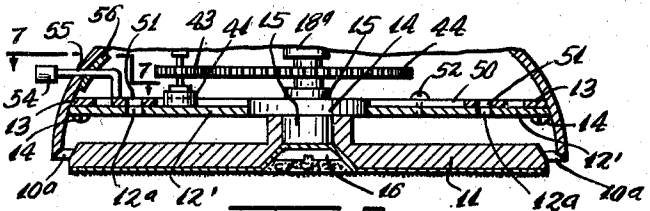


Fig. 6.

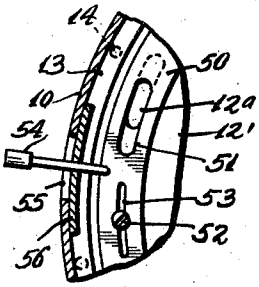


Fig. 7.

INVENTORS
John D. Toro
Max Forschein
BY Zoltan A. Polachek
ATTORNEY

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FLOOR POLISHING AND SANDING DEVICE

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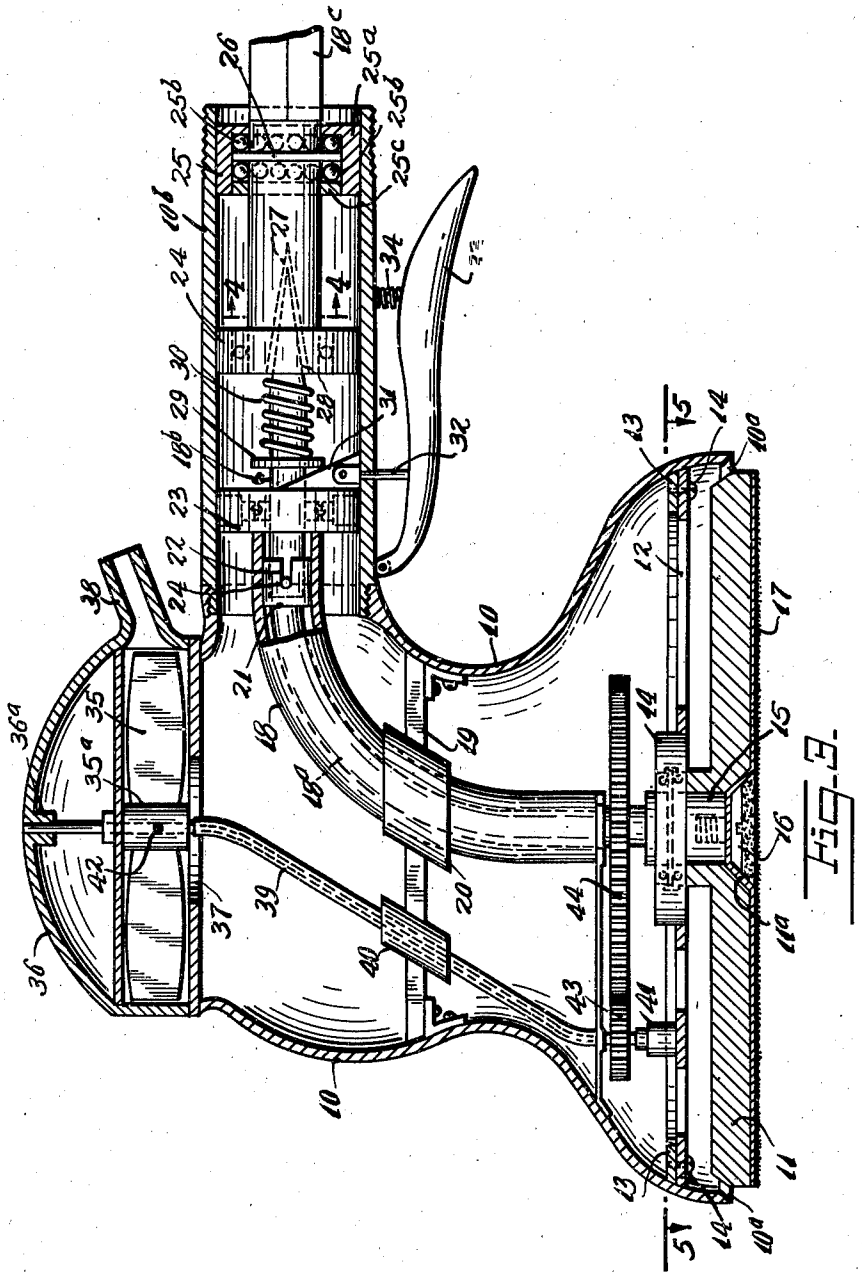


Fig. 5

INVENTORS
John D. Toro
BY Max Forschein
Zoltan O. Polachek
ATTORNEY

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FLOOR POLISHING AND SANDING DEVICE

John D. Toro and Max Forschein, Brooklyn, N. Y.

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8 Claims. (Cl. 51—170)

This invention relates to new and useful improvements in a floor polishing and sanding device.

More specifically, the invention proposes the construction of a floor polishing and sanding device characterized by a hollow casing having a circular opening in its bottom and across which a sand paper holding disc is rotatively supported for engagement against the floor for polishing the same as the casing is moved thereover.

Still further it is proposed to provide one side of the hollow casing with a tubular handle through which a flexible transmission system extends and which has its inner end connected with the sand paper holding disc and its outer end is adapted to be connected with a source of rotative power for rotating the said disc.

Still further it is proposed to provide a suction fan mounted in the top of the casing above the disc and having its intake connected with the interior of the casing and having an external discharge for connection with a dust collecting system to draw the dust and dirt created by the sand papering operation into the casing and discharge the same into the dust collector.

Still further it is proposed to provide a drive for the fan and connected with the transmission system for causing the same to be rotated at a high speed when the transmission system is in operation.

Still further it is proposed to provide a wall transversely mounted across the casing slightly above the sand paper holding disc and having passages for air through which the refuse of the sand papering operation may pass.

Still further it is proposed to provide an adjustably mounted shutter for controlling the size of the air passages to control the volume of air passing therethrough.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is an elevational view of a floor polishing and sanding device constructed according to this invention.

Fig. 2 is a plan view of Fig. 1.

Fig. 3 is an enlarged sectional view on the line 3—3 of Fig. 2.

Fig. 4 is a sectional view on the line 4—4 of Fig. 3.

Fig. 5 is a sectional view taken on the line 5—5 of Fig. 3.

Fig. 6 is a view similar to a portion of Fig. 3 but illustrating a modification of the invention.

Fig. 7 is a sectional view on the line 7—7 of Fig. 6.

The floor polishing and sanding device comprises a hollow casing 10 having a circular opening 10ª at its bottom and a tubular handle 10ᵇ at one side. The casing 10 is adapted to be molded as a solid piece except for the handle 10ᵇ which is separately molded and threadedly engaged in position upon the casing 10 as shown in Fig. 3. A second handle 10ᶜ is also provided upon another side of the casing and spaced substantially 90° from the handle 10ᵇ. When the device is in operation the right hand on the handle 10ᶜ, permitting the operator to have complete control of the device for controlling the movement thereof over the floor at all times.

A sand paper holding disc 11 is rotatively supported across the circular opening 10ª. A web member 12 is fixedly attached to the inner walls of the casing 10 slightly above the opening 10ª upon a flange 13. Screws 14 engage through the adjacent portions of the flange 13 and the web 12 for holding the web in position within the casing 10. At its center the web 12 supports a thrust bearing 14. The thrust bearing in turn rotatively supports a stud shaft 15 upon which the sand paper holding disc 11 is fixedly attached. This attachment is accomplished by means of a large headed screw 16 having its shank portion threadedly engaged into the stud shaft 15 and its head set into an opening 11ª formed in the center of the disc 11 for keeping the head of the screw 16 out of contact with the floor over which the device is being moved. A circular piece of sand paper 17 is fixedly attached to the bottom face of the disc 11 and has its center portion extending into the opening 11ª and engaged beneath the head of the screw 16 in a manner so that the screw 16 may assist in holding the paper 17 in position.

A flexible transmission system 18 extends through the tubular handle 10ᵇ and has its inner end connected with the stud shaft 15 for rotating the sand paper holding disc 11. The outer end of the transmission system 18 is adapted to be connected with a source of rotative power for rotating the same to rotate the disc 11. The transmission system 18 is constructed from several sections 18ª, 18ᵇ and 18ᶜ, all connected together in a novel manner by means of a clutch mechanism for permitting the rotation of the

disc 11 to be controlled without disturbing the source of rotative power. The inner end of the section 18a is connected with the stud shaft 15.

A bracket 19 extends horizontally through the center of the casing 10 and is provided with a bearing 20 through which the section 18a extends. The upper end of the section 18a is provided with a cup shaped member 21 having a slot 22 formed in its side. The section 18b is contained entirely within the handle 10b and is slidably and rotatively supported in a bearing 23 extending transversely across the handle 10b. The end of the section 18b adjacent the section 18a is formed with a pin 24 which extends into the slot 22 for connecting these sections together in a manner so that as the section 18b rotates the section 18a will rotate therewith.

The section 18c is arranged in end alignment with the section 18b and has its end extending from the end of the handle 10b and squared, as shown in the figures, for connection with the source of rotative power. The inner end of the section 18c is rotatively supported in a bearing 24 located within the handle 10b. The intermediate portion of the section 18c is rotatively supported in a thrust bearing 25 extending across the handle 10b near the end thereof. The thrust bearing comprises a cup shaped member 25a into which a flange 26 formed on the section 18c extends. Ball bearings 25b are positioned within the cup shaped member 25a on either side of the flange 26. A ring 25c is inserted into and fixedly attached across the open end of the cup shaped member 25a for maintaining the bearings 25b and the flange 26 in position therein for rotatively supporting the section 18c.

The section 18b is adapted to be connected and disconnected with the section 18c in a novel manner for controlling the operation of the sand paper holding disc 11. The end of the section 18c adjacent the section 18b is formed with a cone shaped opening 27. The adjacent end of the section 18b is cone shaped and is adapted to extend into the cone shaped openings 27b. A circular flange 29 is formed upon an intermediate portion of the section 18b and an expansion spring 30 operates between the adjacent faces of the flange 29 and the bearing 24 for urging the section 18b into a position in which the cone-shaped end 28 will be released from the cone shaped opening 27. This position is illustrated in Fig. 3.

The end of the section 18b is slidably engaged into the cup shaped member 21 formed on the adjacent end of the section 18a to permit the section 18b to be moved against the holding action of the spring 30 to engage the cone shaped end 28 tightly into the cone shaped opening 27. A wedge shaped member 31 operates between the adjacent face of the flange 29 and the bearing 23 for urging the section 18b towards the section 18c against the holding action of the spring 30. A downwardly extending peg 32 extending from the wedge 31 is connected with a handle 33 pivotally supported upon the bottom side of the handle 10b. The handle 33 is adapted to be manually urged towards the handle 10b for causing the wedge 31 to move upwards within the handle 10b to urge the section 18b towards the section 18c. A spring 34 operates between the handle 10b and the outer end of the handle 33 for urging the handle 33 back to its normal position after it has been released.

A suction fan 35 is mounted within an auxiliary casing 36 mounted upon the top end of the casing 10. The bottom of the auxiliary casing 36 is formed with an intake opening 37 connected with the interior of the casing 10. The side of the auxiliary casing 36 is formed with a discharge opening 38 which is adapted to be connected with a dust collecting system for collecting the dust and dirt gathered by the same for discharging it.

A drive is provided for connection with the transmission system 18 for causing the fan to be rotated at a high rate of speed when the transmission system is in operation. This drive comprises a flexible shaft 39 which extends through a bearing 40 formed on the bracket 19. The bottom end of the flexible shaft 29 is rotatively supported in a bearing 41 mounted upon the web 12. The upper end of the flexible shaft 39 extends through the hub 35a of the fan 35 and has the hub securely attached thereto by means of a screw 42. The very end of the flexible shaft 39 is rotatively supported in a bearing 36a formed in the top of the auxiliary casing 36. A small gear 43 is mounted on the bottom end of the flexible shaft 39 just above the bearing 41 and is adapted to mesh with a large gear 44 mounted on the bottom end of the section 18a of the transmission system 18. The gear 44 is a larger gear than the gear 43 and is mounted just above the bearing 14 and as the transmission system rotates the rotations will be transmitted to the flexible shaft 39 through the gears for causing the fan 35 to rotate. The fan 35 is shaped in a manner to discharge through the opening 38 as it rotates and to suck the air from the interior of the casing 10. The air will be supplied to the interior of the casing through the opening 10a formed in the bottom thereof. A slight space has been left between the adjacent edges of the casing 10 and disc 11 through which the air is adapted to pass. (See Fig. 3.) As the pair passes through this opening it will lift the dust and dirt formed by the sand papering operation and carry it upwards through the casing 10 and discharge it through the opening 38.

The connection between the transmission system 18 and the flexible shaft 39 may be accomplished by a pulley system or any other similar drive means, and I do not wish to be limited to the specific gear formation shown on the drawings.

The operation of this device is as follows:

For causing the disc 11 to rotate to sand paper the floor over which it is being passed the end of the section 18c of the transmission system 18 is connected with a source of rotative power for causing this section to be continually rotated. For engaging the section 18b with the section 18c to cause the disc to be rotated when desired, the handle 33 is moved towards the handle 10b against the holding action of the spring 34 which causes the wedge 31 to be moved upwards between the adjacent faces of the flange 29 and the bearing 23. This movement of the wedge 31 causes the section 18b to be moved towards the section 18c against the holding action of the spring 30 to engage the cone shaped end 28 into the cone shaped opening 27 to cause the sections 18a and 18b to be rotated. This rotation will cause the disc 11 to rotate and as it is passed over the floor it will sand paper the same.

The fan 35 mounted within the auxiliary casing 36 is adapted to be rotated by the flexible shaft 39 which is connected to the transmission system 18 by means of the gears 43 and 44. As the fan rotates it will cause the air contained within the casing 10 to be discharged through the

opening 38 drawing fresh air into the casing between the adjacent edge portions of the disc 11 and the opening 10a. As the air passes therein it will lift the dust and dirt created by the sand papering operation and cause it to be moved through the casing 10 to be discharged through the opening 38 which is connected with a dust collecting system for collecting the dust and dirt.

If it is desired to momentarily halt the sand papering operation for any reason, the same may be accomplished by releasing the handle 33 to permit the springs 30 and 34 to urge the handle 33 and the section 18b back to their normal positions.

According to the modification of the invention shown in Figs. 6 and 7 a wall 12' is mounted transversely across the casing 10 and spaced in slightly from the open end 10a thereof and is provided with a plurality of passages 12a through which the refuse from the sand papering operation may pass. The passages 12a are arranged in a circle around the bearings 14 and 41 which are mounted on the wall 12'. A shutter is provided for controlling the operative size of the passages to control the volume of air passing therethrough. The shutter 50 is in the form of an annular ring and is provided with a plurality of openings 51 in aligned positions with the openings 12a. The ring 50 is rotatively supported by means of a plurality of screws 52 extending through arcuate elongated slots 53 formed in the shutter 50 and threadedly engaged into the adjacent face of the wall 12'.

A means is provided for controlling the movement of the shutter 50 to align and disalign the openings 51 and 12a. This means comprises a handle 54 having its inner end securely attached to the top face of the shutter 50 and extending through an elongated slot 55 formed in one side of the casing 10. A shield 56 is mounted upon the handle 54 within the casing 10 and is adapted to extend across the slot 55 in all of the adjusted positions of the handle to prevent the loss of air therethrough. The shield 56 is fixedly attached upon the handle and is adapted to move therewith as the handle is moved for moving the shutter 50 to align and disalign the openings 12a and 51. In other respects this form of the invention is similar to the previous form.

While we have illustrated and described the preferred embodiments of our invention, it is to be understood that we do not limit ourselves to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

Having thus described our invention, what we claim as new and desire to secure by United States Letters Patent is:

1. A floor polishing and sanding device, comprising a hollow casing having a circular opening in its bottom and a tubular handle at one side, a sand paper holding disc rotatively supported across said circular opening, a flexible transmission system extending through said tubular handle and having its inner end connected with said disc to rotate the same and having its outer end adapted to be connected with a source of rotative power, a suction fan mounted in the top of said casing above said disc and having its intake connected with the interior of said casing and having an external discharge for connecting with a dust collecting system, and a drive for said fan connected with the transmission system, said casing being formed with a web member extending transversely thereof and spaced in slightly from said open bottom, a thrust bearing mounted upon said web member, a stud shaft rotatively supported in said thrust bearing and having its bottom end connection with said disc and its upper end connected with said flexible transmission system.

2. A floor polishing and sanding device, comprising a hollow casing having a circular opening in its bottom and a tubular handle at one side, a sand paper holding disc rotatively supported across said circular opening, a flexible transmission system extending through said tubular handle and having its inner end connected with said disc to rotate the same and having its outer end adapted to be connected with a source of rotative power, a suction fan mounted in the top of said casing above said disc and having its intake connected with the interior of said casing and having an external discharge for connection with a dust collecting system, and a drive for said fan connected with the transmission system, said transmission system being constructed from several sections of flexible shaft material, two of said sections being slidably connected together and two of said sections having their adjacent ends releasably connected together, said releasable connection comprising a cone shaped end formed on one of said sections and engageable into a complementary cone shaped opening formed in the other of said sections, and a means for urging said section having said cone shaped end towards said section having said cone shaped opening.

3. A floor polishing and sanding device, comprising a hollow casing having a circular opening in its bottom and a tubular handle at one side, a sand paper holding disc rotatively supported across said circular opening, a flexible transmission system extending through said tubular handle and having its inner end connected with said disc to rotate the same and having its outer end adapted to be connected with a source of rotative power, a suction fan mounted in the top of said casing above said disc and having its intake connected with the interior of said casing and having an external discharge for connection with a dust collecting system, and a drive for said fan connected with the transmission system, said transmission system being constructed from several sections of flexible shaft material, two of said sections being slidably connected together and two of said sections having their adjacent ends releasibly connected together, said releasible connection comprising a cone shaped end formed on one of said sections and engageable into a complementary cone shaped opening formed in the other of said sections, and a means for urging said section having said cone shaped end towards said section having said cone shaped opening, said means comprising a bearing supporting said section having said cone shaped end, a flange formed on said section having said cone shaped end, and a wedge shaped member engageable between the adjacent faces of said flange and said bearing, and a means for moving said flange to move said section having said cone shaped end, and a resilient means for urging said section having said cone shaped end back to its normal position when said first-mentioned means is released.

4. A floor polishing and sanding device, comprising a hollow casing having a circular opening in its bottom and a tubular handle at one side, a sand paper holding disc rotatively supported across said circular opening, a flexible trans-

mission system extending through said tubular handle and having its inner end connected with said disc to rotate the same and having its outer end adapted to be connected with a source of rotative power, a suction fan mounted in the top of said casing above said disc and having its intake connected with the interior of said casing and having an external discharge for connection with a dust collecting system, and a drive for said fan connected with the transmission system, said transmission system being constructed from several sections of flexible shaft material, two of said sections being slidably connected together and two of said sections having their adjacent ends releasably connected together, said releasable connection comprising a cone shaped end formed on one of said sections and engageable into a complementary cone shaped opening formed in the other of said sections, and a means for urging said section having said cone shaped end towards said section having said cone shaped opening, said means comprising a bearing supporting said section having said cone shaped end, a flange formed on said section having said cone shaped end, and a wedge shaped member engageable between the adjacent faces of said flange and said bearings, and a means for moving said flange to move said section having said cone shaped end, and a resilient means for urging said section having said cone shaped end back to its normal position when said first-mentioned means is released, said resilient means comprising a bearing rotatively supporting the end of said section having said cone shaped opening, and a spring operating between said flange on said section having said cone shaped end and said bearing.

5. A floor polishing and sanding device, comprising a hollow casing having a circular opening in its bottom and a tubular handle at one side, a sand paper holding disc rotatively supported across said circular opening, a flexible transmission system extending through said tubular handle and having its inner end connected with said disc to rotate the same and having its outer end adapted to be connected with a source of rotative power, a suction fan mounted in the top of said casing above said disc and having its intake connected with the interior of said casing and having an external discharge for connecting with a dust collecting system, and a drive for said fan connected with the transmission system, said drive for said fan comprising a rotatively supported flexible shaft having said fan mounted on a portion thereof, a large gear mounted on a portion of said transmission system, and a small gear mounted on said flexible shaft and meshing with said large gear to cause said shaft to be rapidly rotated as said large gear is rotated by said transmission system.

6. A floor polishing and sanding device, comprising a hollow casing having a circular opening in its bottom and a tubular handle at one side, a sand paper holding disc rotatively supported across said circular opening, a flexible transmission system extending through said tubular handle and having its inner end connected with said disc to rotate the same and having its outer end adapted to be connected with a source of rotative power, a suction fan mounted in the top of said casing above said disc and having its intake connected with the interior of said casing and having an external discharge for connecting with a dust collecting system, and a drive for said fan connected with the transmission system, a wall transversely mounted across said casing and spaced in slightly from the open end thereof and having passages for air through which the refuse from the sandpapering operation may pass, and a shutter for controlling the passage of air through said passages.

7. A floor polishing and sanding device, comprising a hollow casing having a circular opening in its bottom and a tubular handle at one side, a sand paper holding disc rotatively supported across said circular opening, a flexible transmission system extending through said tubular handle and having its inner end connected with said disc to rotate the same and having its outer end adapted to be connected with a source of rotative power, a suction fan mounted in the top of said casing above said disc and having its intake connected with the interior of said casing and having an external discharge for connecting with a dust collecting system, and a drive for said fan connected with the transmission system, a wall transversely mounted across said casing and spaced in slightly from the open end thereof and having passages for air through which the refuse from the sand papering operation may pass, and a shutter for controlling the passage of air through said passages, said shutter being in the form of a ring having passages in aligned positions with the passages in said wall and a handle mounted on said shutter and extending to the exterior of said casing through a slot formed in the side thereof, a shield mounted on said handle and extending across said slot for preventing the loss of air therethrough, and a means for rotatively supporting said ring on said wall.

8. A floor polishing and sanding device, comprising a hollow casing having a circular opening in its bottom and a tubular handle at one side, a sand paper holding disc rotatively supported across said circular opening, a flexible transmission system extending through said tubular handle and having its inner end connected with said disc to rotate the same and having its outer end adapted to be connected with a source of rotative power, a suction fan mounted in the top of said casing above said disc and having its intake connected with the interior of said casing and having an external discharge for connecting with a dust collecting system, and a drive for said fan connected with the transmission system, a wall transversely mounted across said casing and spaced in slightly from the open end thereof and having passages for air through which the refuse from the sandpapering operation may pass, and a shutter for controlling the passage of air through said passages, said shutter being in the form of a ring having passages in aligned positions with the passages in said wall and a handle mounted on said shutter and extending to the exterior of said casing through a slot formed in the side thereof, a shield mounted on said handle and extending across said slot for preventing the loss of air therethrough, and a means for rotatively supporting said ring on said wall, said means comprising a plurality of screws extending through elongated slots formed in said ring and threadedly engaged into openings formed in said wall.

JOHN D. TORO.
MAX FORSCHEIN.