Dec. 17, 1940. C. A. McELEVEY 2,225,225

HOUSING FOR BUFFING WHEELS AND THE LIKE

Filed March 18, 1940 2 Sheets-Sheet 1

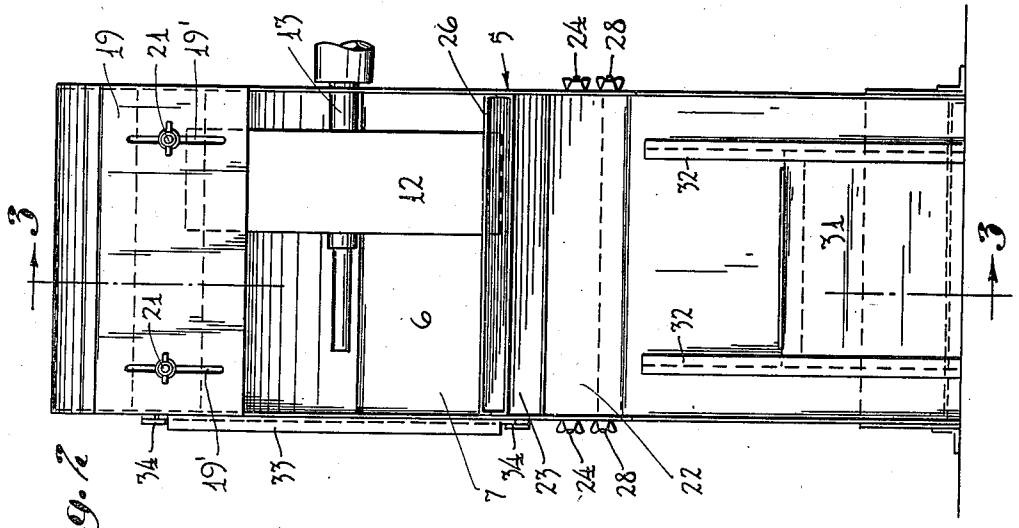


Fig. 2

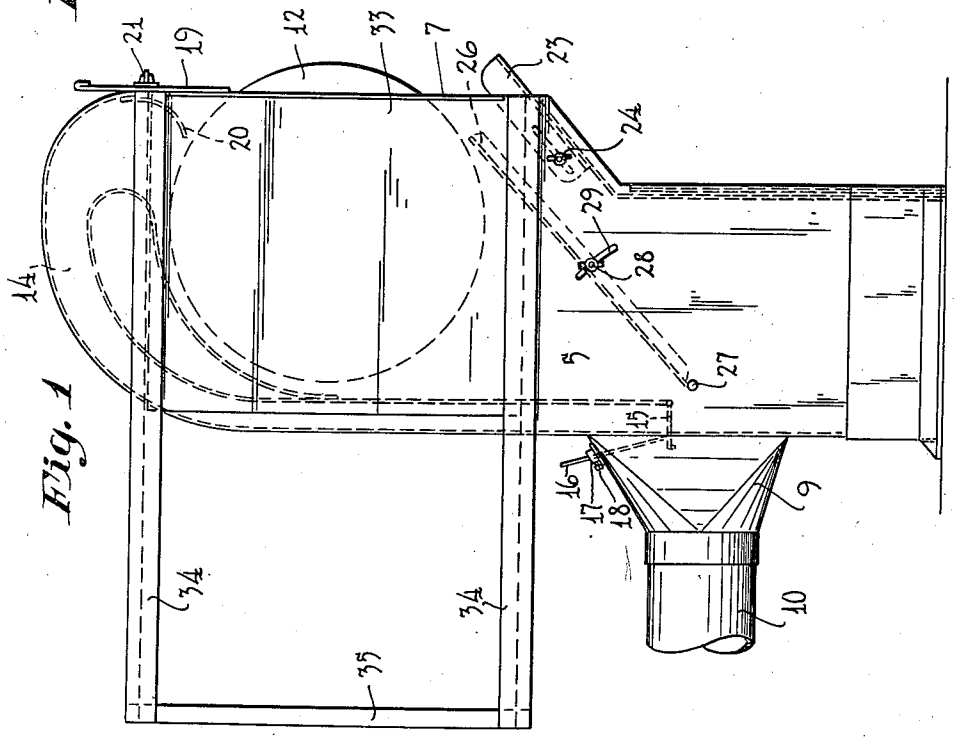


Fig. 1

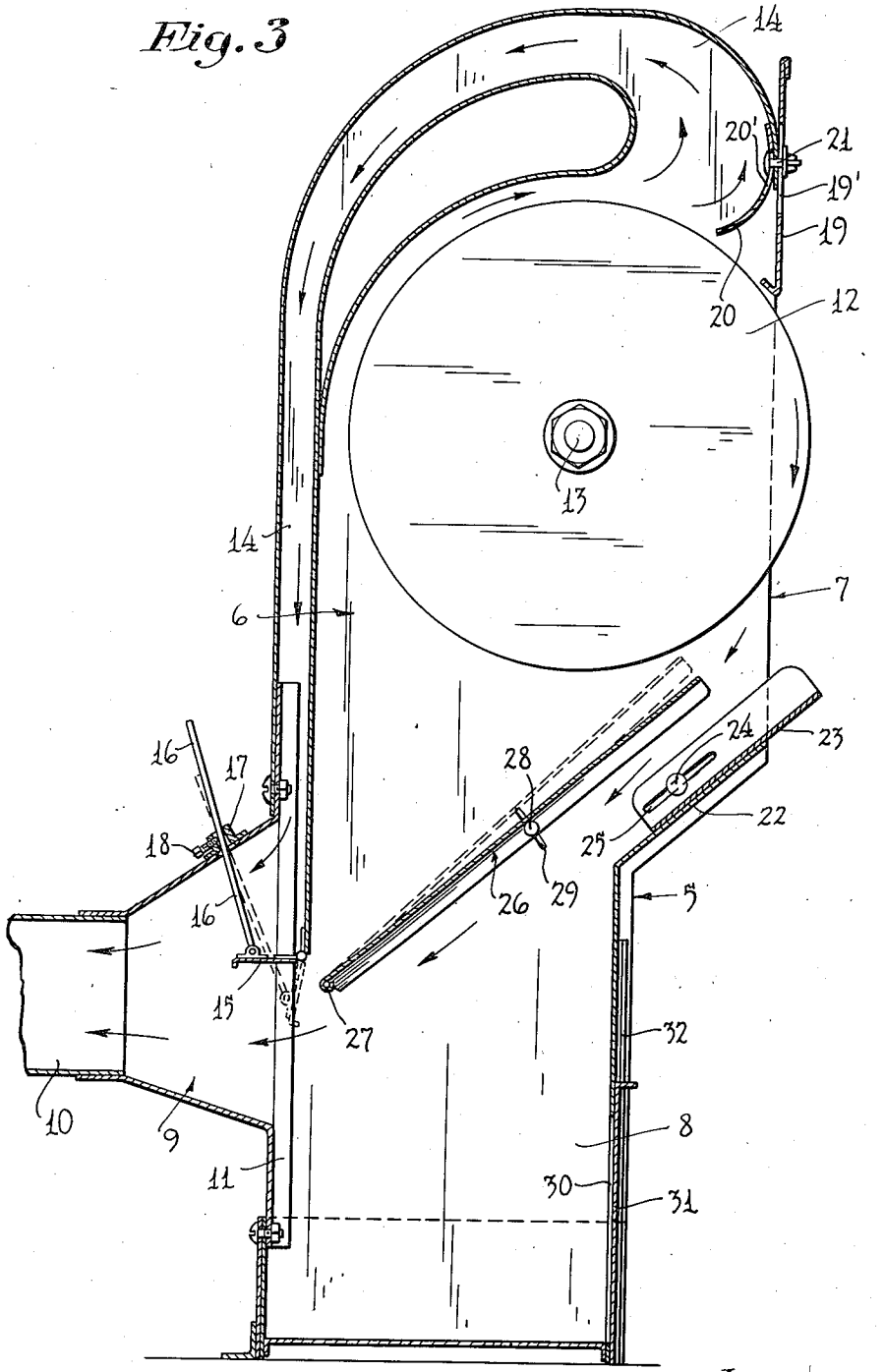
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Fig. 3



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2,225,225

HOUSING FOR BUFFING WHEELS AND THE LIKE

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Application March 18, 1940, Serial No. 324,562

7 Claims. (Cl. 51—273)

My invention has for its object to provide and does provide an improved enclosing casing or hood structure for buffing wheels, grinding wheels, and the like; and, generally stated, consists of the novel devices, combinations of devices, and arrangement of parts hereinafter described and defined in the claims.

More specifically stated, the invention provides an enclosing casing for abrasion wheels, wherein, by the arrangement of the casing and air conduits, baffles and the like air currents produced by suction or partial vacuum will pick up and collect all fine particles produced in the buffing or grinding action and prevent the same from being discharged through the opening in the casing through which a portion of the wheel necessarily projects. It is, of course, well understood that the fine particles produced in buffing or similar actions are very detrimental to the health of an operator and must be prevented from reaching the operator. My invention effectually prevents the above detrimental action.

The preferred form of the invention is illustrated in the accompanying drawings wherein like characters indicate like parts throughout the several views.

Referring to the drawings:

Fig. 1 is a side elevation of the improved device;

Fig. 2 is a front elevation of the said device; and

Fig. 3 is a vertical section taken on the line 3—3 of Fig. 2.

The casing, which is preferably a sheet metal structure, is indicated as an entirety by the numeral 5 and is formed with a wheel chamber 6 with a front opening 7 and with a depending collecting or dead air chamber 8. At its back or rear the casing is provided with an outlet sleeve or extension 9 which, by a suction tube 10 or otherwise, will usually be connected to the main suction pipe of a vacuum conveying system, not shown. On opposite sides of the outlet extension 9 the casing is shown as reinforced by angle bars 11 or the like.

In the drawings, the buffing or other abrasive wheel 12 is located in the chamber 6 with a portion thereof projecting through the opening 7, as best shown in Fig. 3. This wheel 12 is shown as secured to a power-driven spindle or shaft 13 that extends through one wall of the casing. Said wheel, is, of course, detachable from the spindle and applicable thereto while the shaft is projected into the said chamber 6, as shown in the drawings. Opening from the top of the chamber 6, at a point immediately above the top of the wheel 12, is an air conduit 14 that is formed in part by a wall of the main casing and extends downward and opens directly into the upper portion of the sleeve-like outlet 9. Pivotally attached to the extreme lower edge of the inner wall of the conduit 14 is a hinged gate 15 that is made adjustable by suitable means, such as a rod 16, pivoted to said gate and working through a guide hub 17 secured on the exterior of the sleeve 9 and having a set-screw 18 or the like for holding the gate in desired set adjustments. For the purpose of this, it will later appear.

The upper wall of the conduit 14, at its upper extremity, is preferably provided with two adjustable extension plates 19 and 20, both of which are adjustably held by suitable means, such as a nut-equipped bolt 21 passed through a perforation in the upper wall of the conduit 14 and working through slots 19' and 20', respectively, in the said plates 19 and 20. The extension plates 19 and 20 will both be adjusted close to the periphery of the opening 7 so as to as nearly as practicable close the receiving end of the conduit 14 from the discharge of fine materials and for the passage of air from the receiving end of the conduit to the outside of the casing.

At the lower portion of the opening 7 the casing is formed with an inclined portion 22 on which is slidably mounted an inclined catch plate 23. The plate 23, as shown, is flanged and is made adjustably securable in different positions by nut-equipped bolts 24 that work through perforations in the side walls of the casing and through slots 25 in the flanges of said plate 23.

Mounted in the casing, between the chambers 6 and 8, is a quite long inclined deflecting plate 26, the upper end of which is spaced from the plate 23 and from the wheel 12 and the lower end of which is spaced from the hinge connection between the gate 15 and the lower end of the inner wall of the conduit 14. Preferably, this deflecting plate 26 is pivoted to the sides of the casing by a hinge rod 27 or the like. The said plate 26 is adapted to be secured in different angular adjustments by nut-equipped bolts 28 or the like that work through perforations in flanges of said plate and through slots 29 in the sides of the casing.

The adjustable plate 26 has an additional important function in that when adjusted close to the grinding wheel, it will act as a sort of skim-

mer plate and will deflect downward the particles resulting from the grinding or polishing action and will prevent the same from being carried by the wheel and the air current produced thereby above said plate. In this way the work required by the suction produced in the air conduit 14 will be reduced to a minimum. Of course, the extent to which this will take place will depend upon the closeness of the free upper edge of the plate 26 to the periphery of the grinding wheel.

To afford access to the collecting chamber 8, it is shown as provided with a large opening 30 that is normally closed by a gate 31 mounted for vertical sliding movements in guide flanges 32 secured on the casing. Normally, of course, the gate 31 will be in a closed position.

At one side in line with the wheel 12, the casing is formed with a large opening that is normally closed by a plate or door 33 that is mounted to slide in suitable guides, such as upper and lower flanged guide strips 34 secured to the adjacent side of the casing and extended far enough rearward therefrom to permit the door 33 to be moved into a position to afford access to the wheel 12 and to permit the said wheel to be applied to or removed from its shaft or spindle 13. The guide strips 34 are shown as tied together at their extended ends by a tie-bar 35.

Operation

The operation of the device described is substantially as follows: Under suction or partial vacuum produced in the sleeve or extension 9, strong currents of air will be drawn into the said sleeve from two sources, to wit: through the suction conduit 14 in the direction of the arrows marked therein, and downward from the wheel chiefly between the plates 23 and 26 and thence to said sleeve or outlet 9. The wheel being revolved in a clockwise direction, in respect to Fig. 3, will throw downward more of the materials ground or removed from an article being buffed or likewise treated and these particles will chiefly be thrown downward and precipitated into the settling chamber 8, but some of the lighter particles will be drawn out through the said sleeve 9. The lighter particles will be picked up from the wheel by the suction produced in the conduit 14 and from thence will be delivered into the sleeve 9. The rotation of the wheel itself in the direction indicated has a sort of fan action and produces a strong flow of air in the direction in which it is rotated.

By adjustments of the gate 15 the relative strength of the suction from the lower portion of the wheel to the sleeve and through the conduit 14 to the sleeve, may be varied so that just the right collecting action may be produced under varying conditions of the work being performed. Where the wheel is arranged to grind metal portions from the object being treated, it will usually require a stronger lower draft than it does through the suction tube 14 and the converse of this is also true.

The upper end of the deflecting plate 26 will usually be adjusted very close to the periphery of the grinding wheel, but any particles carried beyond the upper edge of this deflecting plate will, under the action of centrifugal force, be discharged from the wheel and by the said deflecting plate will be directed to the lower portion of the casing, and the heavier particles will be precipitated into the settling chamber while some of the lighter particles will be carried outward through the sleeve 9.

A preferred form of the apparatus has been illustrated, but it will be understood that the same is capable of various modifications as to details of construction and arrangement of parts all within the scope of the invention herein disclosed and claimed.

What I claim is:

1. In an apparatus of the kind described, a casing having a wheel chamber open at its front and further having a settling chamber depending from said wheel chamber and provided with an outlet opening therefrom at a point above the bottom of said settling chamber, a suction conduit leading from the upper portion of said wheel chamber and terminating immediately adjacent said outlet, and an inclined deflecting plate located within said casing with its upper end in the lower portion of the front opening of said casing and with its lower end closely spaced from the lower delivery end of said suction conduit.

2. The structure defined in claim 1 in further combination with means for opening and closing to a greater or less extent the passage or opening between the lower end of said suction conduit and the lower portion of said outlet.

3. The structure defined in claim 1 in further combination with means for opening and closing to a greater or less extent the passage or opening between the lower end of said suction conduit and the lower portion of said outlet, said deflecting plate at its lower end being mounted on a fixed pivot with its free upper end adjustable toward and from a grinding wheel in the wheel chamber of said casing.

4. The structure defined in claim 1 in which said casing at one side has a large opening normally closed by a movable door, said lateral opening being of substantially the size of the wheel chamber of said casing.

5. The structure defined in claim 1 in further combination with a grinding wheel rotatively mounted in said casing with its upper portion adjacent the intake end of said suction conduit and with its lower portion closely adjacent to the upper end of said deflecting plate.

6. The structure defined in claim 1 in further combination with a gate hinged to the lower end of the inner wall of said suction conduit and arranged to swing into and out of said outlet and toward and from the lower end of said deflecting plate.

7. In an apparatus of the kind described, a casing having a wheel chamber open at its front and further having a settling chamber depending below said wheel chamber and provided with an outlet therefrom at a point above the bottom of said chamber, and a suction conduit leading from the upper front portion of said wheel chamber and terminating adjacent said outlet, said suction conduit at its upper receiving end being provided with two extensible plates, the inner of which is curved downwardly and backwardly in respect to the direction in which said conduit is extended and the other of which is extensible on a line outward of said curved plate.

CLARK A. McELEVEY.