Aug. 18, 1942. D. M. DOW 2,293,457

VACUUM CLEANER

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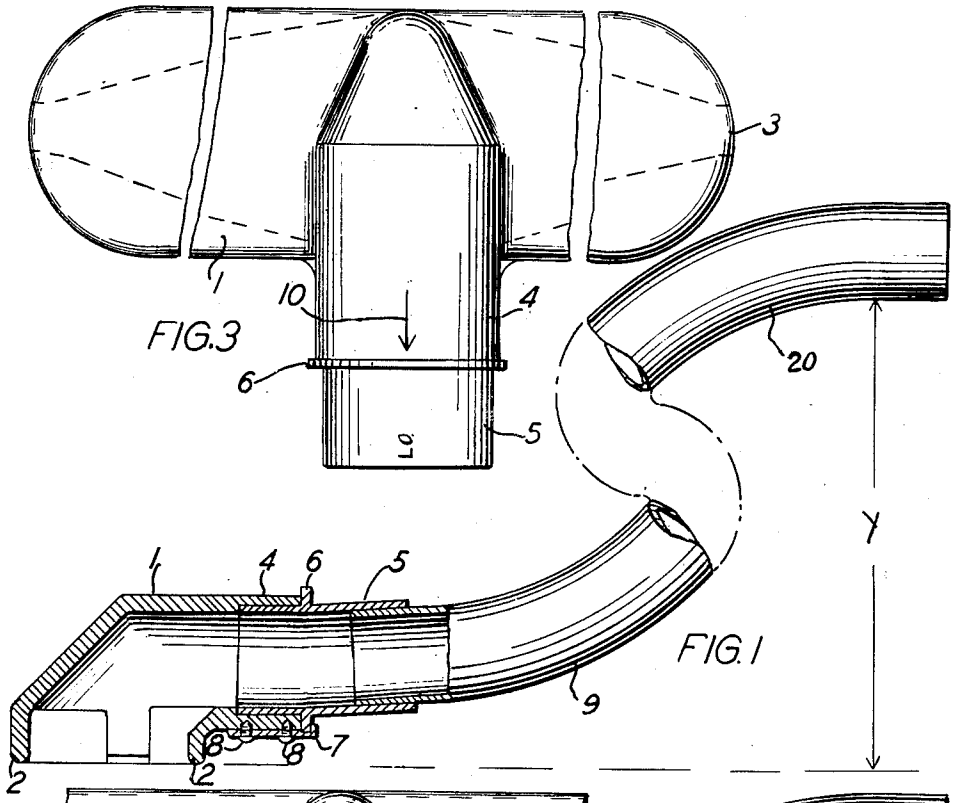


FIG. 3

FIG. 1

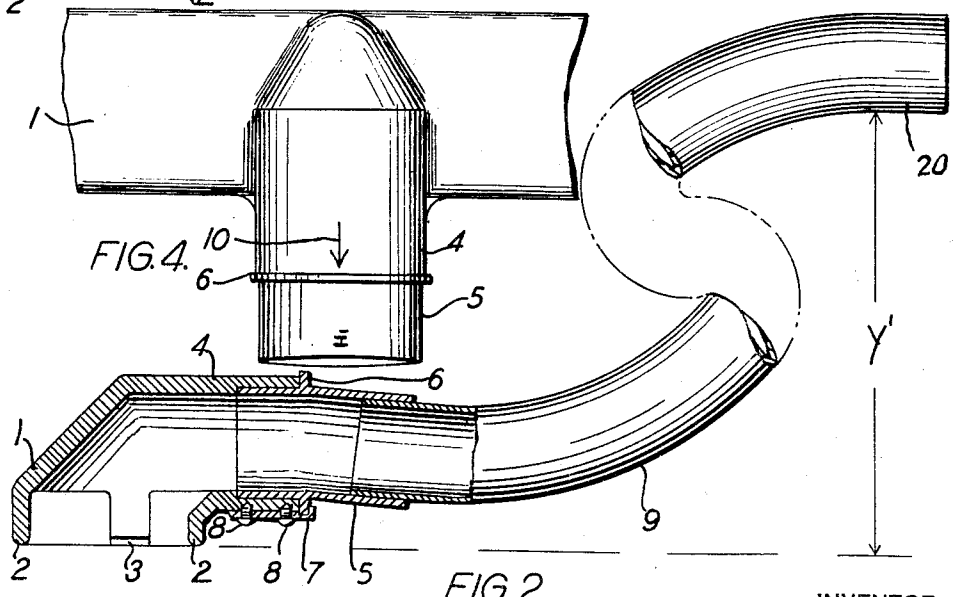


FIG. 4.

FIG. 2

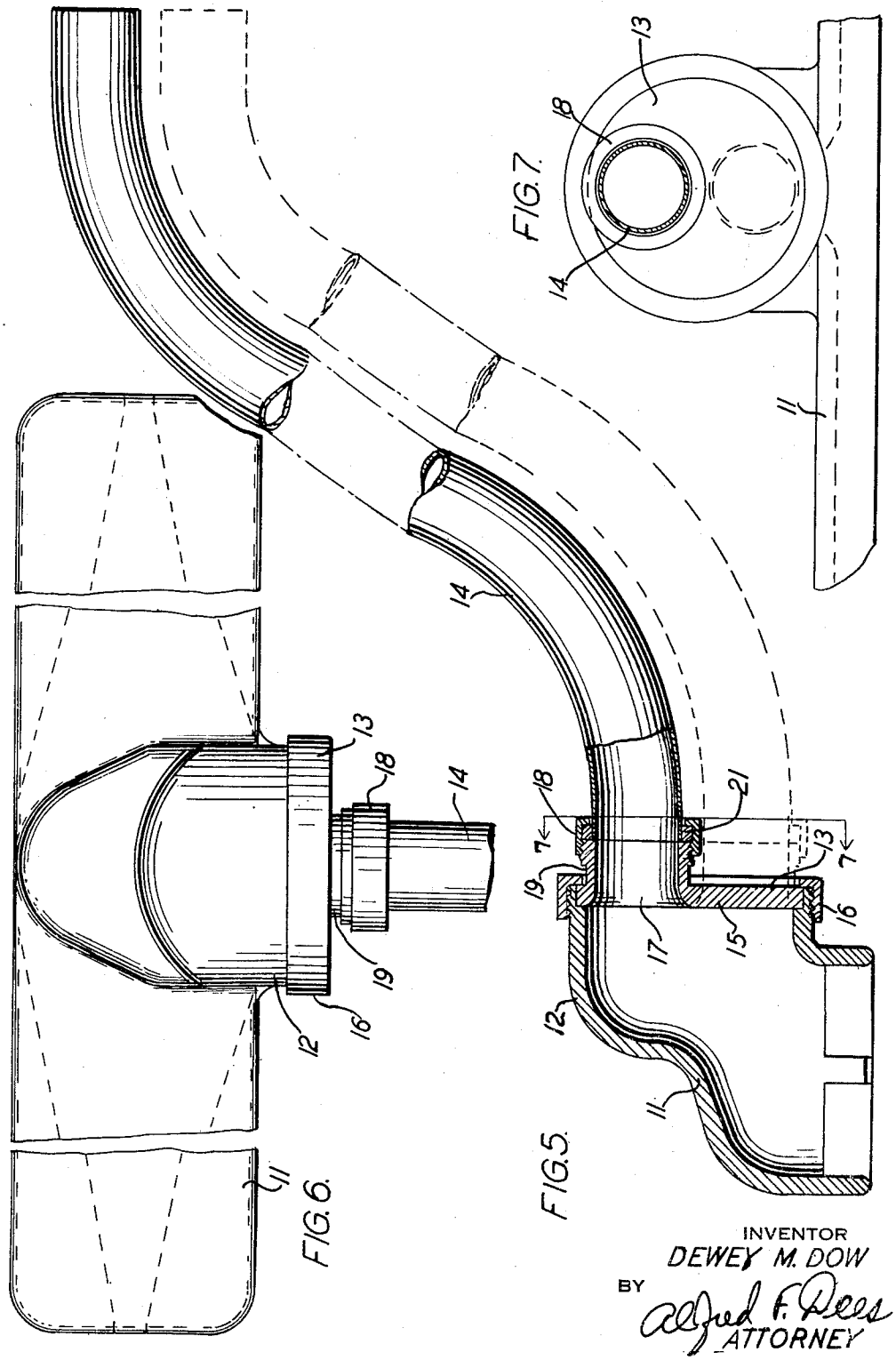
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UNITED STATES PATENT OFFICE

2,293,457

VACUUM CLEANER

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5 Claims. (Cl. 15—156)

This invention relates to vacuum cleaners and has as its object to provide a vacuum cleaner wherein the floor tool may be adjusted with reference to the wand or handle of the cleaner in such a manner as to vary the vertical angle between the floor tool and wand and thereby adjust the height of the handle with reference to the surface being cleaned so as to adapt the cleaner to persons of varying height, without changing the position of the floor tool with reference to the horizontal, and without moving the handle out of a plane at right angles to the longitudinal axis of the floor tool.

Another object of the invention is to produce a handle adjusting device that is adjustable to any one of an infinite number of positions through a range from maximum to minimum adjustment within the limits of structure provided.

Other and further objects of the invention will occur to those skilled in the art to which this invention pertains as the description proceeds which taken in connection with the accompanying drawings sets forth preferred embodiments thereof, but it is to be distinctly understood that such description and embodiments are not to be taken as limitations of the invention which is limited only by the appended claims and any and all modification, alterations and variations of structure coming within the spirit and scope thereof are deemed to be included herein.

In the drawings:

Fig. 1 illustrates a vertical partial sectional view showing the handle in its uppermost position.

Fig. 2 is a view similar to Fig. 1 with the handle in its lowermost position.

Fig. 3 shows a plan view of the floor tool with the eccentric in low position.

Fig. 4 shows a plan view with the eccentric in high position.

Fig. 5 shows a vertical elevational partly in section to show the construction of a modification of the invention.

Fig. 6 shows a plan view of the same.

Fig. 7 shows a view taken along the line 7—7 of Fig. 5.

The efficient operation of cleaners employing floor tools mounted on the end of any one given shape of wand requires that the lips or surface engaging face of the nozzle be correctly positioned relative to the surface being cleaned. The most preferred position is in having the plane defined by the lips of the nozzle or floor tool parallel with the surface being cleaned although a position in which the forward lip is very slightly elevated will be equally satisfactory and under certain very limited conditions of operation it may even be the preferred position. In the conventional construction it is evident that varying heights of persons will operate the floor tool in as many different positions. A person that is short will be inclined to unduly elevate the forward lip and one that is tall will have a tendency to elevate the rear lip and ride the floor tool on the forward lip. A person of medium height will perhaps come closest to maintaining the correct position. The instant invention aims to provide a means and mechanism for compensating the varying statures of operators such that irrespective of the height of the operator some one position of floor tool and handle may be made which will be most suitable to the operator and still maintain the correct operating position of the floor tool relative to the surface being cleaned.

As an example of one form in which the invention may be embodied, I have shown in Figs. 1-4 inclusive a vacuum cleaner of the "wand" type including a floor tool 1 having surface engaging lips 2, 2, spaced apart as shown and which at the ends of the tool 1 converge toward openings 3 adapted to prevent absolute seal, with the shape of the nozzle mouth opening indicated generally by the dotted lines shown in Fig. 3.

Extending rearwardly from the floor tool is nozzle outlet 4 the interior of which is operatively connected to the floor tool 1.

Mounted in the outlet 4 is one end region of an adjusting coupling 5. The coupling 5 has a flange 6 held in engagement with the end of the outlet 4 by means of a clip 7 which is secured by screws 8 to the outlet 4. To the other end region of the coupling 5 is coupled a wand 9 the upper end of which forms a handle 20.

The coupling 5 is rotatable with reference to both the outlet 4 and the wand 9, from the position shown in Fig. 1 to a position 180° removed therefrom, as shown in Fig. 2. The axes of the respective end regions of the coupling 5 define an obtuse angle. As a result, rotation of the coupling from the position shown in Fig. 1 to the position shown in Fig. 2 will vary the angle defined between the axis of the outlet 4 and the wand 9. Thus the height of the handle 20 may be varied while the nozzle lips 2 remain in a horizontal plane or in a plane of uniform angularity relative to the horizontal, and while the wand 9 remains in a plane at right angles to the longitudinal axis of the floor tool.

In prior wand type cleaners, a single swivel

joint between the wand and floor tool, the axis of which is inclined with reference to that of the floor tool outlet, permits the handle to be raised and lowered relative to the plane of the nozzle lips. But in order to do so it is necessary to rotate the handle relative to the floor tool, destroying the right angular relationship between the plane of the handle and the longitudinal axis of the floor tool. Under such conditions, if the handle is maintained in a vertical plane, the floor tool will be diagonally disposed with reference to its path of movement, and if the floor tool is maintained at right angles to the path of movement, the handle will necessarily be inclined to one side or the other from its normal position in a vertical plane. The present invention, while permitting this type of adjustment between the handle and floor tool during cleaning operations, provides an additional adjustment whereby handle height may be regulated without otherwise varying the relationship between the wand and the nozzle. The two positions of handle height are indicated at Y and Y' respectively in Figs. 1 and 2, Y indicating the high handle position and Y' indicating the low handle position.

To facilitate adjustment, the coupling is marked with the indicating characters "Hi" and "Lo" respectively, adapted to be registered with an arrow 10 on the outlet 4.

In the modification shown in Figs. 5–7, 11 indicates a floor tool similar to the floor tool 1 of Fig. 1. The floor tool 11 has an outlet 12 which is connected to a wand 14 by means of an adjusting coupling 13. The coupling 13 includes a disc portion 15 rotatably mounted in a counterbore in the outlet 12 and maintained therein by a collar 16 threaded onto the outlet 12. Formed on the disc portion 15 is an eccentric nipple 19 to which the wand 14 is rotatably coupled by means of a collar 18. The collar 18 is threaded on the nipple 19 and receives a flange 21 on the end of the wand. The upper end of wand 14 forms a handle 20.

The coupling 13 may be rotated with reference to both the floor tool and wand, from a high position shown in full lines in Fig. 5 to a low position shown in dotted lines in that figure, thus varying the height of the handle without otherwise changing the relationship between the wand and the floor tool. In addition, the handle may be adjusted to any desired intermediate position, without any other change in relationship between the wand and floor tool except for a slight offsetting of the wand to one side of the center of the outlet 12.

I claim as my invention:

1. In a vacuum cleaner, a floor tool having an inlet and an outlet, means forming at one end a handle and at its other end a suction tube, a coupling having at one end a rotatable connection with said tube and at its other end a rotatable connection with said outlet, said rotatable connections being misaligned so as to effect, as a result of rotation of said coupling relative to both floor tool and suction tube, an adjustment of the height of said handle relative to the plane of said inlet without otherwise varying the relationship between the handle and the floor tool.

2. In a vacuum cleaner, a floor tool having an inlet and an outlet, means forming at one end a handle and at its other end a suction tube, a coupling having at one end a rotatable connection with said tube and at its other end a rotatable connection with said outlet, said rotatable connections permitting 180° rotation of said coupling relative to said floor tool and suction tube and being misaligned with reference to each other so as to effect, as a result of such rotation, adjustment of the height of the handle relative to the plane of said inlet without otherwise varying the relationship between the floor tool and handle.

3. In a vacuum cleaner, a floor tool having an inlet and an outlet, means forming at one end a handle and at its other end a suction tube, a coupling having at one end a rotatable connection with said tube and at its other end a rotatable connection with said outlet, said rotatable connections being misaligned so as to effect, as a result of rotation of said coupling relative to both floor tool and suction tube, an adjustment of the height of said handle relative to the plane of said inlet while permitting the handle to remain in a plane at right angles to the longitudinal axis of the floor tool.

4. A vacuum cleaner as defined in claim 3, wherein the respective end regions of said coupling are disposed at an obtuse angle relative to each other and rotation of the coupling is adapted to change the angle between the axis of said suction tube and the axis of said outlet.

5. A vacuum cleaner as defined in claim 3, wherein the respective end regions of said coupling are disposed eccentrically with relationship to each other and rotation of the coupling is adapted to bodily raise or lower the suction tube and handle with reference to the floor tool.

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