A device for adjusting the level of a rotary brush mounted inside the housing of a vacuum cleaner attachment including a driving member mounted for rotation in the housing at one end of the brush and a driven member also mounted for rotation in the housing at the other end of the brush. A stationary shaft is eccentrically connected at each end thereof to the driving and driven members for transmitting the rotary movement imparted by the driving member to the driven member so as to simultaneously vary the level of both ends of the stationary shaft. The brush is mounted for rotation of the stationary shaft and the level thereof is adjusted by the movement of the stationary shaft.
This invention relates to a rotary brush adjustment device for use with a vacuum cleaner attachment. Motor-operated brush attachments have been provided lately for use with vacuum cleaners in order to provide better cleaning of rugs. Such a rotary brush is normally mounted for rotation within the housing of the vacuum cleaner attachment and, when it is worn out after a certain amount of use, it is replaced by a new one. Such an arrangement is not too convenient because the height of the brush above the floor level is fixed and pre-set to suit a rug of average thickness. In addition, the brushes are never used to their full capacity and must be thrown out even if the bristles thereof are still long enough to be put to useful use.

It is therefore the object of the invention to provide an adjustment of the level of such a rotary brush so as to extend the life thereof and also to suit rugs of various thickness.

Means for varying the height of household appliances above the floor have been provided in the prior art. However, such means are usually coupled with the rollers of the appliances and, therefore, require separate control devices for each roller. Such an adjustment is cumbersome and, in addition, would not provide an even adjustment of the rotary brush.

It is therefore the main object of the invention to provide an easy adjustment of the level of the rotary brush of a vacuum cleaner attachment which avoids the necessity of adjusting the level of each end of the rotary brush individually.

The device, in accordance with the invention, comprises a driving member mounted for rotation on the housing of the vacuum cleaner attachment at one end of the brush, and a driven member also mounted for rotation on the housing of the vacuum cleaner attachment at the other end of the brush.

A stationary shaft is eccentrically connected at each end thereof to the driving and driven members for transmitting the rotary movement imparted by the driving member to the driven member so as to simultaneously vary the level of both ends of the stationary shaft. The brush is mounted for rotation on a stationary shaft and the level thereof is controlled by the movement of the stationary shaft.

In a preferred embodiment of the invention, the driving member is a control lever which may be manually rotated a predetermined number of degrees. Such lever is in the shape of a plate having a number of indexing cams therein permitting to set the rotary brush at predetermined levels above the surface of the floor. The cams cooperate with spring loaded means located on the housing of the vacuum cleaner attachment. Similarly, the driven member is a plate which may also have indexing cams corresponding to the ones of the driving member.

The invention will now be disclosed with reference to a preferred embodiment thereof and to the accompanying drawings in which:

FIG. 1 illustrates a vacuum cleaner attachment including a rotary brush and an adjustment device for such rotary brush;

FIG. 2 illustrates an exploded view of the various parts of the adjustment device; and

FIG. 3 illustrates the operation of the driving member of the adjustment device.

Referring to the drawings, there is shown a rotary brush attachment 10 for a vacuum cleaner comprising a brush 12 rotated by a motor (not shown) through a belt 14. The height of the brush above the floor is controlled by means of the level adjustment device in accordance with the invention and comprising generally a driving member 16 and a driven member 18 which are rotatably mounted on the housing of the attachment 10 about an axis of rotation 20, and a rod 22 which is eccentrically connected to members 16 and 18 at a predetermined distance from axis of rotation 20. The rotation of the driving member 16 in the directions indicated by arrows 24 and 25 will impart a corresponding rotary movement to driven member 18 through rod 22 so as to simultaneously raise or lower both ends of rod 22.

Brush 12 is rotatably mounted on rod 22 by means of needle bearing mount 26 which is secured to brush 12 and needle bearing 28 which is disposed on rod 22. The raising or lowering of rod 22 will consequently raise or lower brush 12.

In the embodiment disclosed, the driving member 16 and the driven member 18 take the form of end plates which are rotatably mounted in slots 30 provided in the housing of the vacuum cleaner attachment 10, the dimensions of such slots being slightly greater than plates 16 and 18. End plates 16 and 18 are arranged to pivot in the slots 30 about pins 32 inserted in holes 33 and 34 in the plates and the housing.

End plate 16 is provided with a control lever 35 for rotating the plate a predetermined number of degrees. In addition, indexing means are provided in at least one of the plates 16 and 18 for determining a number of pre-set levels for the rotary brush. Such indexing means comprise a number of indexing cams 36 in the form of accurate cuts which cooperate with a spring loaded means located on the housing of the attachment 10. Such spring loaded means includes, in the embodiment disclosed, a spring 38 inserted in a hole 40 in the housing and a steel ball 42 adapted to contact cams 36.

End plates 16 and 18 further comprise stop means 44 which are adapted to contact the edge of slots 30 for limiting the amount of rotation of the plates.

Rod 22 is provided with a flattened portion 46 at both ends thereof which cooperate with slots 48 in end plates 16 and 18. Such a connection is advantageous in that it permits to easily couple driving plate 16 to driven plate 18. In addition, brush 12 may be easily dismantled by removing one of the end plates and withdrawing the brush.

In operation, the height of brush 12 above ground is selected by operating lever 35 which will permit to position the end plate 16 in one of its pre-set positions. The rotation of driving plate 16 will rotate driven plate 18 which is coupled thereto by means of rod 22 so as to simultaneously control both ends of the brush 12 mounted on rod 22. Consequently, there will be no need for adjusting both ends of the brush separately.

It is to be understood that the driving and driven members disclosed in the preferred embodiment of the invention may take various forms. Consequently, the invention is not to be limited to the structure of the embodiment disclosed but to the invention as stated in the statement of invention and in the claims attached.

What is claimed is:

1. A device for adjusting the level of a rotary brush mounted inside the housing of a vacuum cleaner attachment comprising:
   a. A driving member mounted for rotation on said housing at one end of said member;
   b. A driven member mounted for rotation on said housing at the other end of said brush;
   c. A shaft eccentrically connected at each end thereof in fixed relation to both driving and driven members for transmitting rotary movement imparted by said driving member to said driven member so as to simultaneously vary the level of both ends of said shaft;
   d. Means for mounting said brush for rotation on said shaft; and
   e. Manually operable means for rotating said driving member.

2. A device as defined in claim 1, wherein said driving member includes a control lever for rotating said driving member a predetermined number of degrees.

3. A device as defined in claim 1, including means for indexing at least one of said members so as to provide a number of pre-set levels for said rotary brush.

4. A device as defined in claim 3, wherein said indexing means comprise a plurality of indexing cams located on at least one of said members and spring loaded means located on said housing and cooperating with said cams.

5. A device as defined in claim 4, wherein said spring loaded means comprise a spring located in a hole in said housing and a steel ball biased by said spring against said indexing cam.
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6. A device as defined in claim 4, wherein said members are plates and wherein said housing includes slots having dimensions slightly greater than said plates for receiving said plates, and further comprising pins passing through said housing and said plates for rotatably mounting said plates within said slots.

7. A device as defined in claim 6, wherein said plates include stop means adapted to contact the edge of said slots for limiting the amount of rotation of said plates.

8. A device as defined in claim 1, wherein each of said members has an elongated slot therein and wherein said shaft has a flattened portion protruding through said elongated slot for coupling said shaft to said members.