United States Patent [19]

Morgan

[11] **3,734,589**

[45] **May 22, 1973**

[54] **HEIGHT ADJUSTMENT MEANS**

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[73] Assignee: **Feeders Corporation,** Edison, N.J.

[22] Filed: **Nov. 15, 1971**

[21] Appl. No.: **198,685**

[52] **U.S. Cl.** **312/351,** 312/311, 312/312

[51] **Int. Cl.** **A47b 51/00**

[58] **Field of Search**.....312/351, 311, 312; 108/147, 144; 211/176, 181

[56] **References Cited**

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922,011	5/1909	Maynard	108/147
1,036,204	8/1912	Farnham	108/147 X
3,472,573	10/1969	Geiger	312/351
3,560,069	2/1971	Doepke	312/351

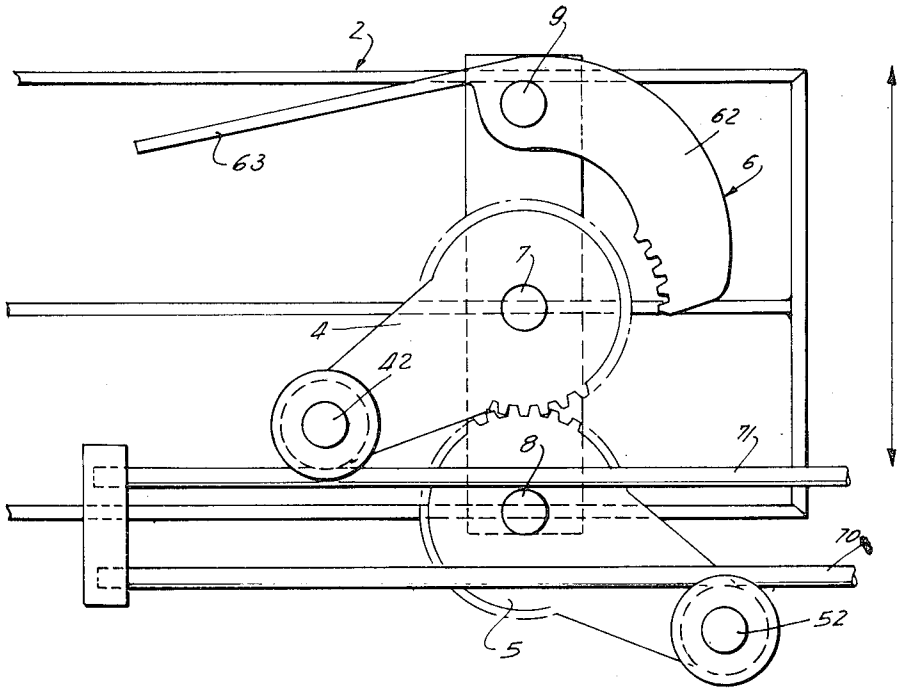
Primary Examiner—James T. McCall

Attorney—David S. Kane et al.

[57] **ABSTRACT**

Means are provided for adjusting the height of one or both sides of the upper basket in a dishwasher, the means including two interengaging members attached to support means on the rack, with bearing members attached to the members adapted to move on the telescoping slide channel.

15 Claims, 4 Drawing Figures



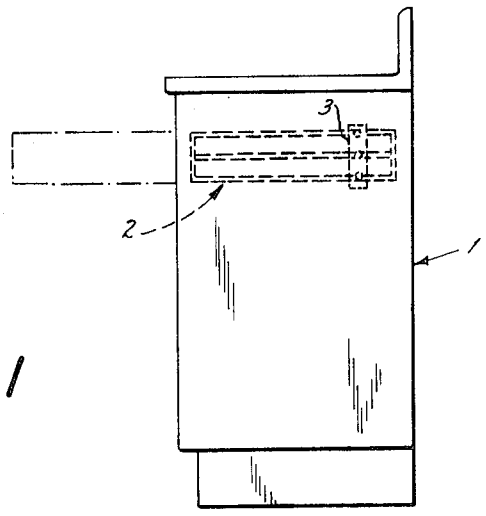


FIG. 1

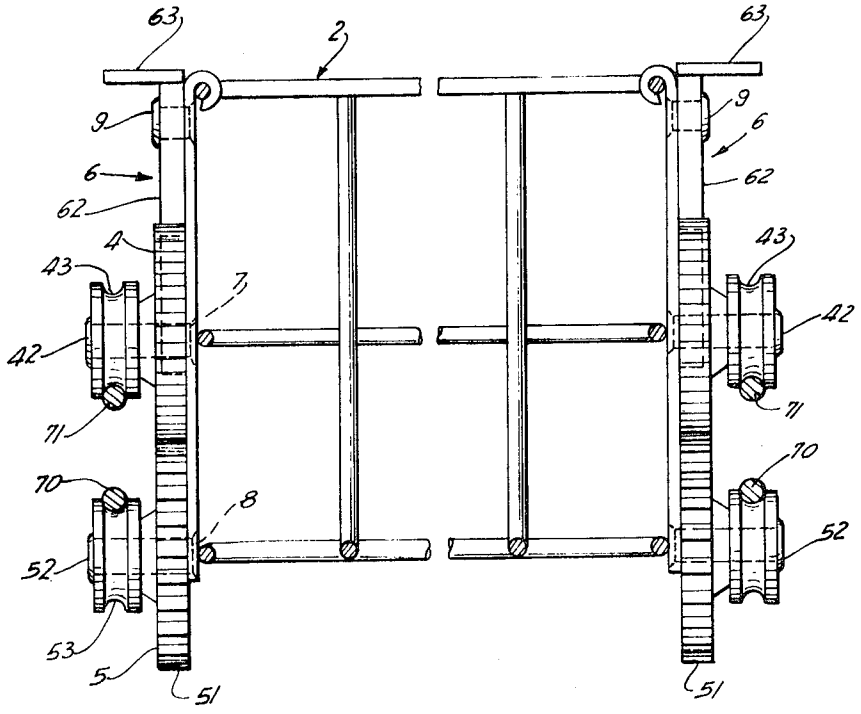
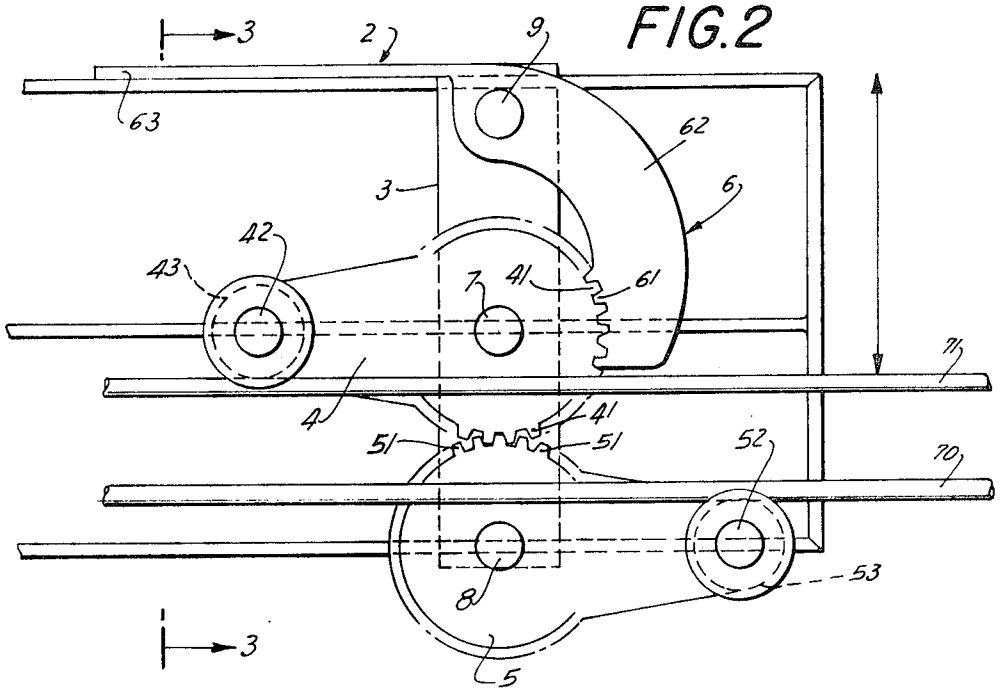


FIG. 3

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FIG. 2



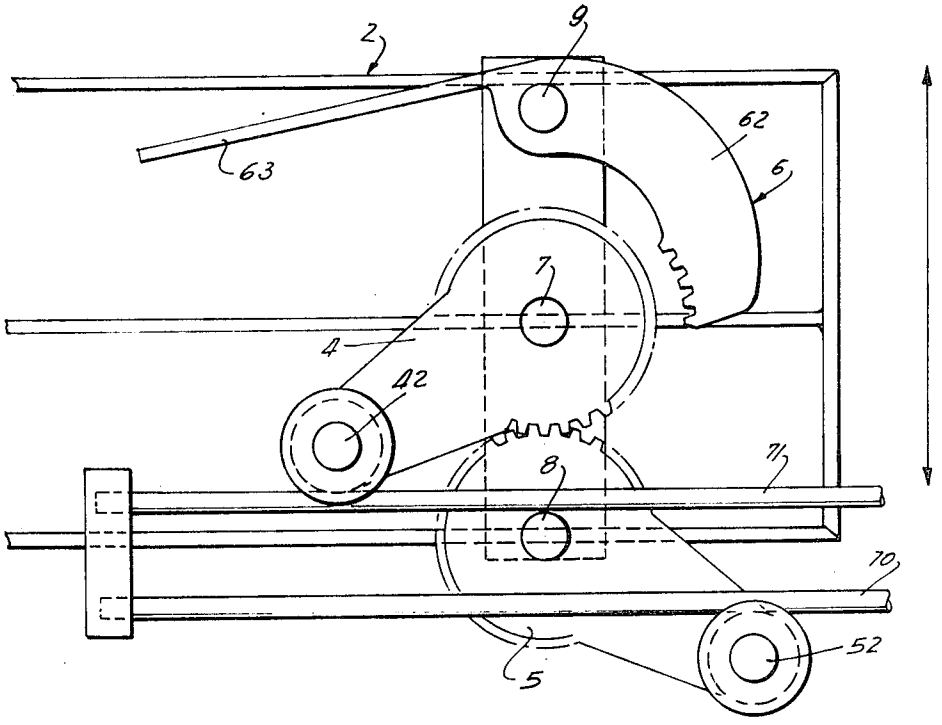


FIG. 4

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HEIGHT ADJUSTMENT MEANS

BACKGROUND OF THE INVENTION

Front loading dishwashers are well known in the art. Such dishwashers are generally provided with two baskets or racks for supporting the articles to be washed. Because of the inconvenience which would otherwise be caused, the racks are generally supported on the bottom or sides of the dishwasher in such a manner that they can be moved horizontally out of the dishwasher vat when the door generally covering the front opening is placed in its open position.

Frequent attempts have been made to provide optimum placement of the upper and lower racks for the items which are generally washed in such a dishwasher. Frequently, the overall height of the dishwasher is limited because of the necessity or desirability of having the top of the dishwasher flush with surrounding cabinetry in the kitchen. However, even in roll-around dishwashers, excessive height cannot be tolerated. Therefore, there are inherent limitations in the placement of the top basket relative to the bottom basket.

In some situations the items to be placed in the lower basket, such as meat platters, are large enough that they interfere with proper movement of the upper basket. In other situations, such as when pilsner glasses are to be washed, such glasses normally being placed in the upper basket, the basket cannot be returned to the dishwasher vat because the height of the glasses is greater than the height differential between the bottom of the upper basket and the top of the dishwasher vat.

In each of the situations named, a means to adjust the height of the upper basket, relative both to the lower basket and to the top of the dishwasher, would be extremely desirable. While systems to accomplish such a variation have been previously disclosed, as, for example, in U.S. Pat. No. 3,472,873 — Geiger, such systems are not totally effective.

SUMMARY OF THE INVENTION

In accordance with the present invention, each side of the upper dish basket is provided with a pair of interengaging means, such as intermeshing segment gears. The end of each segment, opposite the point of intermeshing, is provided with a roller. The segments and rollers are so formed that the rollers engage with a support means attached to the side of the dishwasher vat to allow horizontal movement of the basket and, thus, allow its at least partial removal from within the dishwasher vat.

Vertical movement of the upper dish basket is prevented and the segment gears are held in a desired position, through means of a spring-loaded locking pawl which engages with the teeth on one of the segment gears. When it is desired that the height of the basket be adjusted, the locking pawl is moved against the force of its spring, while grasping the dish basket, and the basket is then moved either up or down, as is desired. Movement of the basket causes rotation of the segment gears with consequent horizontal movement of the attached rollers, thereby maintaining the vertical distance between the rollers and their contact with the support means.

Both sides of the basket may be moved independently or simultaneously so that the basket remains level, or the height of only one side of the basket need be adjusted. Such a single adjustment would be desirable, for example, when only a few tall glasses are to be washed and these can be placed on one side of the upper basket, while a large meat platter would be placed on the opposite side of the lower dish basket and the greater height of that side of the upper dish basket would allow the meat platter to clear.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings:

FIG. 1 is a side view of a front loading dishwasher with a portion of the side wall broken away to show the loading and washing positions of the upper dish basket;

FIG. 2 is an elevational view of the height adjustment means of the present invention in locked position;

FIG. 3 is a view along the line 3—3 of FIG. 2; and

FIG. 4 is an elevational view of the height adjustment means of the present invention in unlocked position.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the accompanying drawings, a dishwasher **1** is illustrated having a slidable upper dish basket **2**, the extended, loading position, illustrated in phantom line. Each side of the basket **2** is provided with a mounting bracket **3** to which is attached segment gears **4** and **5** and a locking pawl **6**. The segment gears and locking pawl are pivotally connected to the mounting bracket **3** by pivots **7, 8** and **9**, respectively. While only the locking mechanism mounted on the right side of the upper basket, as viewed from the front of the machine, is illustrated in detail and will be described in detail, it will be appreciated that the same mechanism will be employed on the left side of the basket, that mechanism being a mirror image of the mechanism mounted on the right side.

Segment gear **4** is provided with a plurality of gear teeth **41** and a pivot mounting **42**. Roller **43** is carried by pivot **42** for a purpose to be later described. In a similar manner, segment gear **5** is provided with a plurality of teeth **51** and a pivot mounting **52** which carries roller **53**.

Locking pawl **6** is provided with a plurality of gear teeth **61** which are formed so as to intermesh with gear teeth **41** of segment gear **4**. The teeth **61** are formed on arm **62** of the locking pawl, which is also provided with a handle **63** on the opposite side of fulcrum pivot **9**. Locking pawl **6** is spring urged to the locking position illustrated in FIG. **2** by means not shown, though any suitable means such as a leaf spring, may be employed.

Mounted to the side of the dishwasher vat in any suitable manner (not shown) are parallel, horizontal guide rails **70** and **71**. These horizontal guide rails may, as illustrated, be two separate coated wires or bars. On the other hand, the rails may be formed on a single channel, the upper rail being formed as the top surface of the channel and the lower rail as the bottom surface of the channel. In general, the rails or channel are roller mounted to the side of the dishwasher vat. Roller **43**, mounted to segment gear **4**, rides on the top of upper horizontal bar **71**, while roller **53**, mounted on lower segment gear **5**, rides below lower horizontal bar **70**.

With the segment gears in the locked position, as illustrated in FIG. **2**, and the rollers **43, 53** riding on respective horizontal rails **71** and **70**, it can be seen that upper basket **2** is cantilever supported on the rails. Such cantilever support will be effective whether the upper dish basket is within the dishwasher vat, as illus-

trated in full line in FIG. 1, or is partially withdrawn from the vat, as illustrated in phantom line in FIG. 1. Thus, as illustrated in FIG. 2, the height of the upper dish basket is fixed.

When it is desired to change the height of upper dish basket 2, locking pawl 6 is rotated counterclockwise about its pivot 9, by depressing handle 63 as illustrated in FIG. 4. Release of the locking pawl permits rotation of segment gears 4 and 5 about pivots 7 and 8. Such rotation of the pivot gears causes a horizontal movement of rollers 43 and 53 along respective horizontal rails 71 and 70, while the rollers remain in contact with these horizontal rails. The vertical component of the rotational movement is accommodated through vertical movement of mounting bracket 3 which, as previously indicated, is firmly attached to upper dish basket 2. Thus, the height of the upper dish basket is adjusted. When handle 63 of locking pawl 6 has been released, the biasing means forces it to the locked position, thus holding the basket in its new vertical position. As will be apparent, the height of either side of the upper dish basket can be so adjusted without movement of the opposite side.

In operation, when the housewife desired to adjust the height of one or both sides of the upper dish basket, she depresses handle 63 so as to release locking pawl 6 from segment gear 4. If the basket is to be raised, she pulls up on the basket, the upward motion being transmitted from upper basket 2 to mounting bracket 3 and directly through pivots 7 and 8 to segment gears 4 and 5. Because roller 53 is against rail 70, upward movement of the basket causes a clockwise rotation of segment gear 5, as illustrated in FIGS. 2 and 4. Because segment gear 5 is meshed with segment gear 4, the clockwise motion of segment gear 5 causes segment gear 4 to rotate counterclockwise, thus causing roller 43 to move to the right, again as illustrated in FIGS. 2 and 4. Handle 63 is then released and the biasing means attached to locking pawl 6 causes the pawl to rotate clockwise so that teeth 61 intermesh with teeth 41 on segment gear 4, effectively locking the segment gears and preventing further movement. The basket is then locked into the new position. It will be apparent that lowering of the basket is accomplished in exactly the opposite manner, by depressing handle 63 and pushing downwardly on dish basket 2.

While the invention has been shown and described with regard to a particular embodiment, the invention should not be considered as limited thereby, but as encompassing the full scope covered in the appended claims.

I claim:

1. In a dishwasher comprising a vat in which are mounted upper and lower dish baskets, the improvement comprising a height adjustment means for at least one of said baskets including:
   a. support means connected to the side of said basket;
   b. a first segment gear pivotally mounted on said support means;
   c. a second segment gear mounted on said support means, said second segment gear intermeshing with said first segment gear;
   d. horizontal slide means mounted to the side of said vat adjacent said support means;
   e. bearing means mounted on each segment gear at a point remote from the point of mounting of said segment gears to said support means, said bearing means bearing on said horizontal slide means; and
   f. locking means to prevent motion of said segment gears.

2. The height adjustment means of claim 1 wherein said horizontal slide means is a pair of parallel bars.

3. The height adjustment means of claim 1 wherein said horizontal slide means is a slide channel having an upper and a lower surface.

4. The height adjustment means of claim 1 wherein each of said bearing means is a roller, the roller mounted to said first segment gear bearing on the upper surface of said horizontal slide means and the roller associated with said second segment gear bearing on the lower surface of said horizontal slide means.

5. The height adjustment means of claim 1 wherein said locking means is a locking pawl.

6. The height adjustment means of claim 5 wherein said pawl is biased to the locked position.

7. In a dishwasher comprising a vat in which are mounted upper and lower dish baskets, the improvement comprising a height adjustment means for at least one of said baskets including:
   a. support means connected to the side of said basket;
   b. a first segment gear pivotally mounted on said support means;
   c. a second segment gear mounted on said support means, said second gear intermeshing with said first segment gear;
   d. horizontal slide means mounted to the side of said vat adjacent said support means; and
   e. bearing means mounted on each segment gear at a point remote from the point of mounting of said segment gears to said support means, said bearing means bearing on said horizontal slide means.

8. The height adjustment means of claim 7 wherein said horizontal slide means is a pair of parallel bars.

9. The height adjustment means of claim 7 wherein said horizontal slide means is a slide channel having an upper and a lower surface.

10. The height adjustment means of claim 7 wherein each of said bearing means is a roller, the roller mounted to said first segment gear bearing on the upper surface of said horizontal slide means and the roller associated with said second segment gear bearing on the lower surface of said horizontal slide means.

11. In a dishwasher comprising a vat in which are mounted upper and lower dish baskets, the improvement comprising a height adjustment means for at least one of said baskets including:
   a. support means attached to the side of said basket;
   b. interengaging members pivotally mounted to said support means, the opposite end of each of said members being provided with bearing members;
   c. horizontal slide means attached to the side of said vat adjacent said support means, said bearing means resting on said slide means; and
   d. means to prevent movement of said interengaging means.

12. The height adjustment means of claim 11 wherein the bearing means are rollers.

13. The height adjustment means of claim 11 wherein said horizontal slide means is a pair of parallel bars, one bearing means acting on said upper bar and the other on the lower bar.

14. The height adjustment means of claim 11 wherein said horizontal slide means is a slide channel having an upper and a lower surface.

15. The height adjustment means of claim 11 wherein said means to prevent movement of said interengaging means is spring-loaded into engagement with said interengaging means.

* * * * *

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,734,589 Dated May 22, 1973

Inventor(s) Wendell D. Morgan

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

On face page, change Assignee:"Feeders Corporation" to -- Fedders Corporation--.

Signed and sealed this 20th day of November 1973.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

RENE D. TEGTMEYER
Acting Commissioner of Patents

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