



US005471910A

United States Patent [19]

[11] **Patent Number:** **5,471,910**

Sager

[45] **Date of Patent:** **Dec. 5, 1995**

[54] **AUTOMATIC COFFEE MACHINE**

0521561A1 6/1992 European Pat. Off. .
1373832 8/1963 France .
33697A1 10/1991 Germany .
635740A5 5/1980 Switzerland .

[75] Inventor: **Peter Sager**, Boppelsen, Switzerland

[73] Assignee: **HGZ Maschinenbau AG**, Dallikon, Switzerland

Primary Examiner—Robert W. Jenkins
Attorney, Agent, or Firm—Hopkins & Thomas

[21] Appl. No.: **300,413**

[57] **ABSTRACT**

[22] Filed: **Sep. 2, 1994**

An automatic coffee machine, has a heating device (5), which has a heating chamber (6), which is formed from a stationary arranged pipe section (4) with a vertical axis (9) as well as two stoppers (7, 8). An axial drive for moving the upper stopper (7) on a turning arm (29) into and out of the pipe section (4) is provided. A pivot drive serves to move the upper stopper (7) into a parking position away from the axis (9) of the pipe section (4) and into a stand-by position in the axis (9) of the pipe section. A vertical drive for the lower stopper (8) is provided. A driven swivel wiper (32) serves to remove a tablet of coffee grounds. The upper stopper (7) is solidly attached to the turning arm (29), a single motor (10) with a following power divider (16) is provided for the axial drive and for the pivot drive of the turning arm (29) with the upper stopper (7) as well as the drive of the swivel wiper (32). The power divider (16) has a stroke-like driven pivot column (15), an axially secured guide bushing (17), and a stationary grooved bushing (18). The guide bushing (17) and the grooved bushing (18) each have a guiding slot (27, 23) for a crosshead (28), which is connected to the pivot column (15).

[30] **Foreign Application Priority Data**

Sep. 2, 1993 [DE] Germany 43 29 597.5

[51] **Int. Cl.⁶** **A47J 31/043**

[52] **U.S. Cl.** **99/289 R; 99/297; 99/302 P**

[58] **Field of Search** 99/289 R, 286, 99/287, 289 D, 289 P, 295, 297, 300, 302 R, 302 P; 426/433

[56] **References Cited**

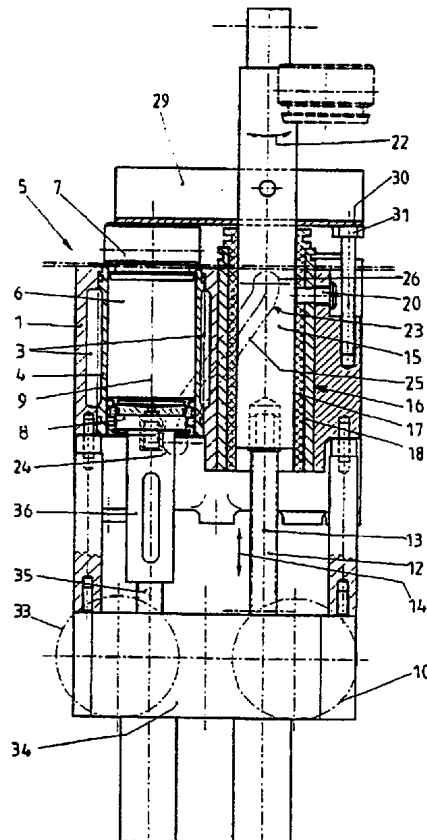
U.S. PATENT DOCUMENTS

- 3,266,410 8/1966 Novi 99/289 R
- 4,457,216 7/1984 Dremmel 99/287
- 4,934,258 6/1990 Versini 99/289 R
- 5,230,277 7/1993 Bianco 99/289 R
- 5,277,102 1/1994 Martinez 99/286

FOREIGN PATENT DOCUMENTS

- 0192797A1 3/1985 European Pat. Off. .
- 0514313A3 5/1992 European Pat. Off. .

11 Claims, 5 Drawing Sheets



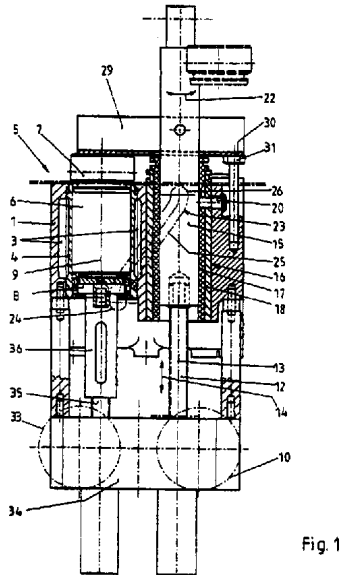


Fig. 1

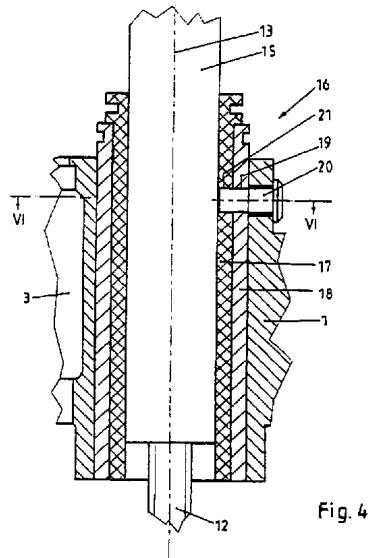


Fig. 4

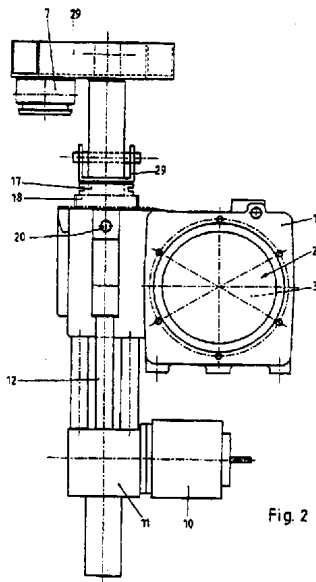


Fig. 2

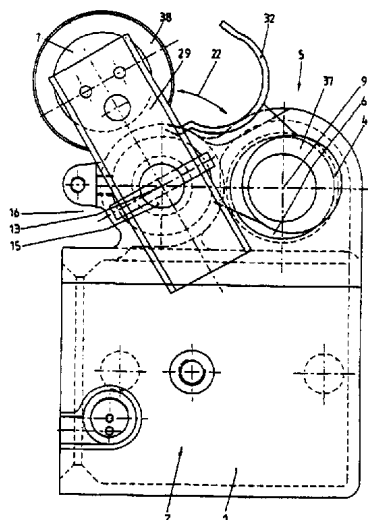


Fig. 3

CLAIM(S)

1. An automatic coffee machine for making single cups and pots of coffee, the coffee machine including a casing, a flow heater disposed within the casing, a brewing device disposed within the casing, the brewing device including an elongated tubular body about an upstanding axis as the brewing chamber, a coffee mill for providing ground coffee to the brewing chamber, a first stopper, a turning arm, the first stopper being rigidly attached to the turning arm, the first stopper having a parking position with respect to the brewing chamber, a stand by position along the axis of the brewing chamber, and a brewing position within said brewing chamber, an axial drive for moving the first stopper along the axis of, and within, the brewing chamber between its brewing and stand by positions, a pivot drive for moving the turning arm and the first stopper from its parking position into its stand by position and back into its parking position, a second stopper, the second stopper being movably held within the brewing chamber, a vertical drive for moving the second stopper along the axis within the brewing chamber, a swivel wiper, the swivel wiper being supported on the casing and adapted to remove spent coffee grounds from the brewing chamber, comprising:

- a power divider;
- a motor, wherein both the axial drive and the pivot drive are powered by said motor and wherein said motor and power divider also operate the swivel wiper;

- wherein said power divider comprises:
 - a stationary grooved bushing mounted in said casing and spaced apart from and parallel to the axis of the brewing chamber,
 - a guide bushing received within the grooved bushing, said guide bushing being secured within the grooved bushing so that it does not move upward and downward within the grooved bushing,
 - an elongated pivot column received within said guide bushing, said pivot column supporting the turning arm, and said pivot column being secured within said guide bushing so that it is free to rotate and move upward and downward within the guide bushing, and

a crosshead fastened to said pivot column in a generally horizontal direction, wherein said crosshead extends from the pivot column into the guide bushing and the grooved bushing;

wherein said guide bushing has an elongated glide slot defined therein, and the grooved bushing has an elongated glide slot defined therein, so that the crosshead travels in both glide slots simultaneously;

whereby the power divider moves the first stopper from its parking position to its stand by position while the swivel wiper removes any spent coffee grounds from the brewing chamber, and also moves the first stopper into its brewing position and then back into its stand by position after coffee has been brewed in the coffee machine, and then moves the first stopper back into its parking position.

2. The coffee machine of claim 1, wherein said motor is positioned below said flow heater, and the power divider passes