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Haberle

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[54] **APPARATUS FOR AUTOMATICALLY CLEANING TOILET SEATS**

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[52] **U.S. Cl.** **4/233,** 4/222

[51] **Int. Cl.** **A47k 13/00**

[58] **Field of Search** 4/233, 222, 237, 242; 15/256.5

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[57] **ABSTRACT**

An apparatus for automatically cleaning a toilet seat, which includes a cleaning unit equipped with brushes and wiping means and adapted to be folded toward and away from the toilet bowl, the cleaning unit being adapted to spray cleaning fluid and disinfectant upon the toilet seat and by means of the cleaning unit to clean the toilet seat and wiping the same dry.

16 Claims, 8 Drawing Figures

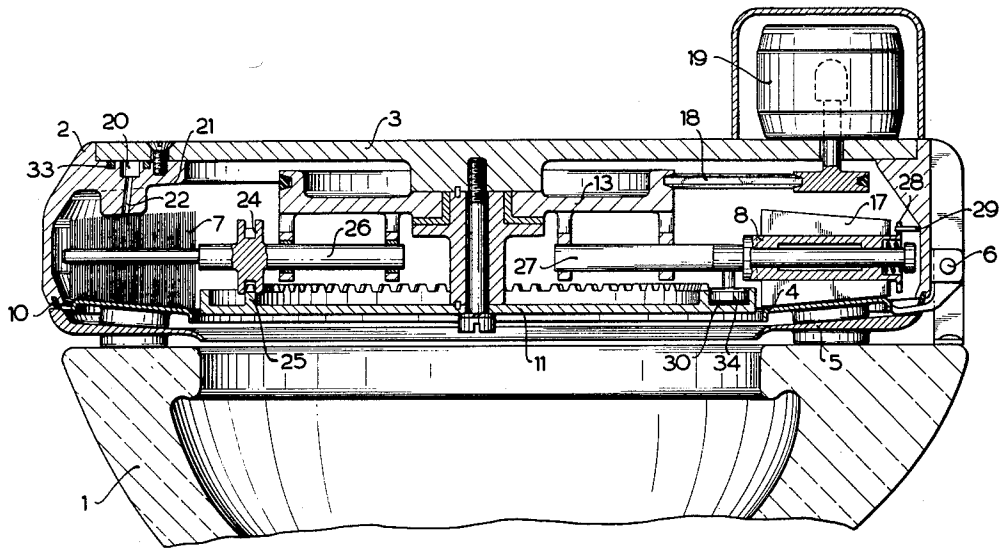


FIG.1

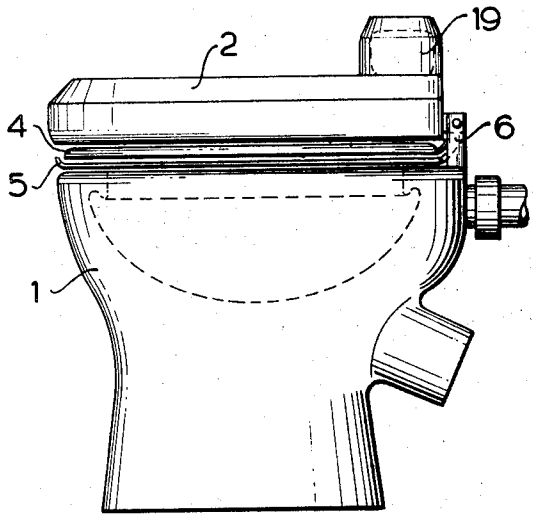


FIG.2

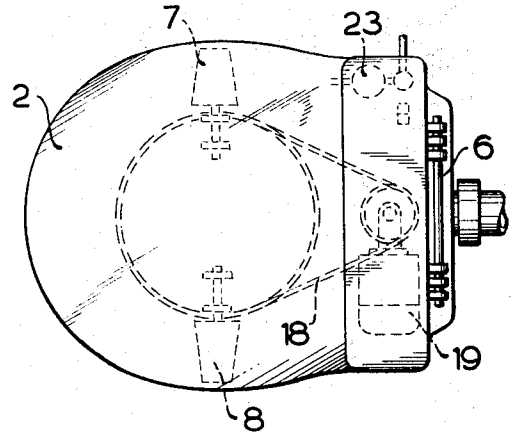


FIG.3

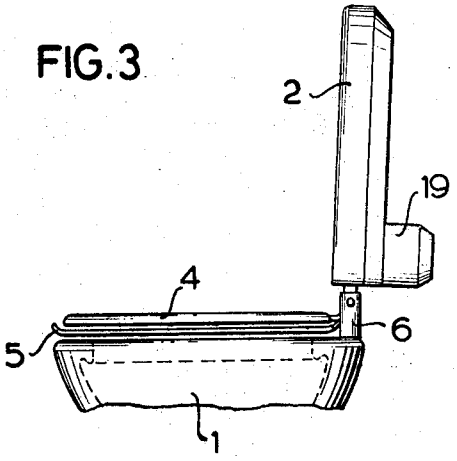


FIG.4

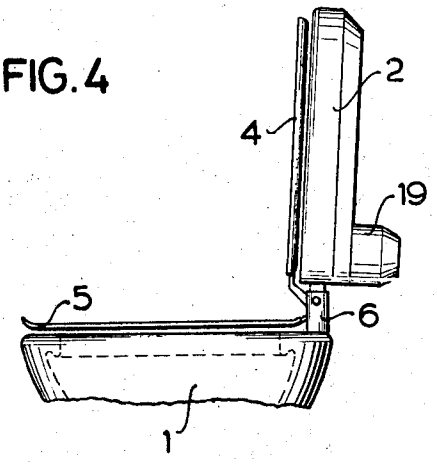
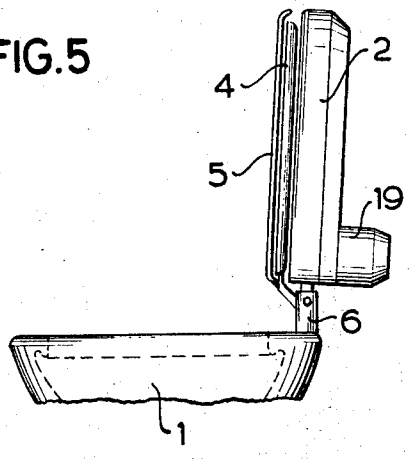


FIG.5



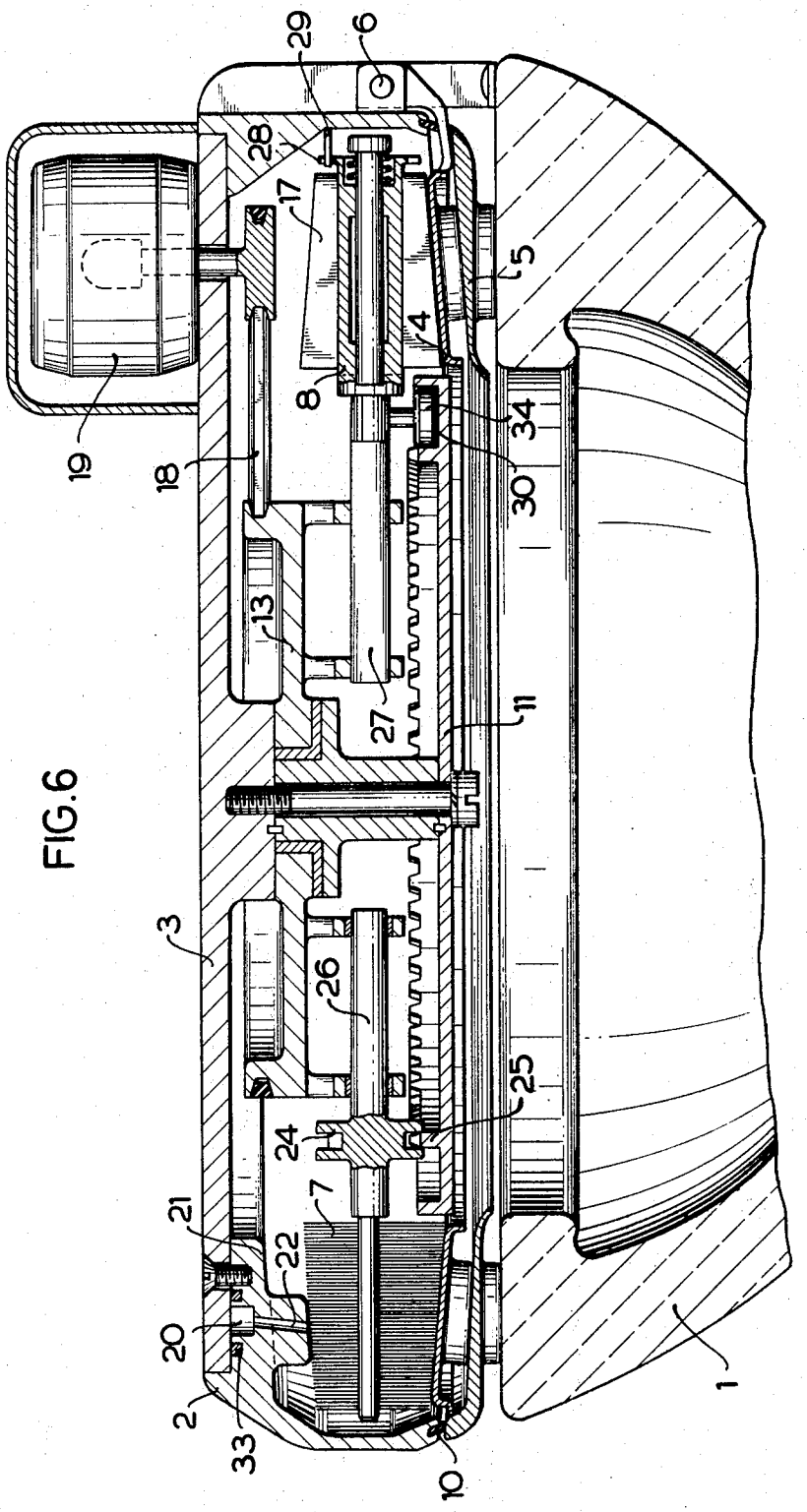


FIG.6

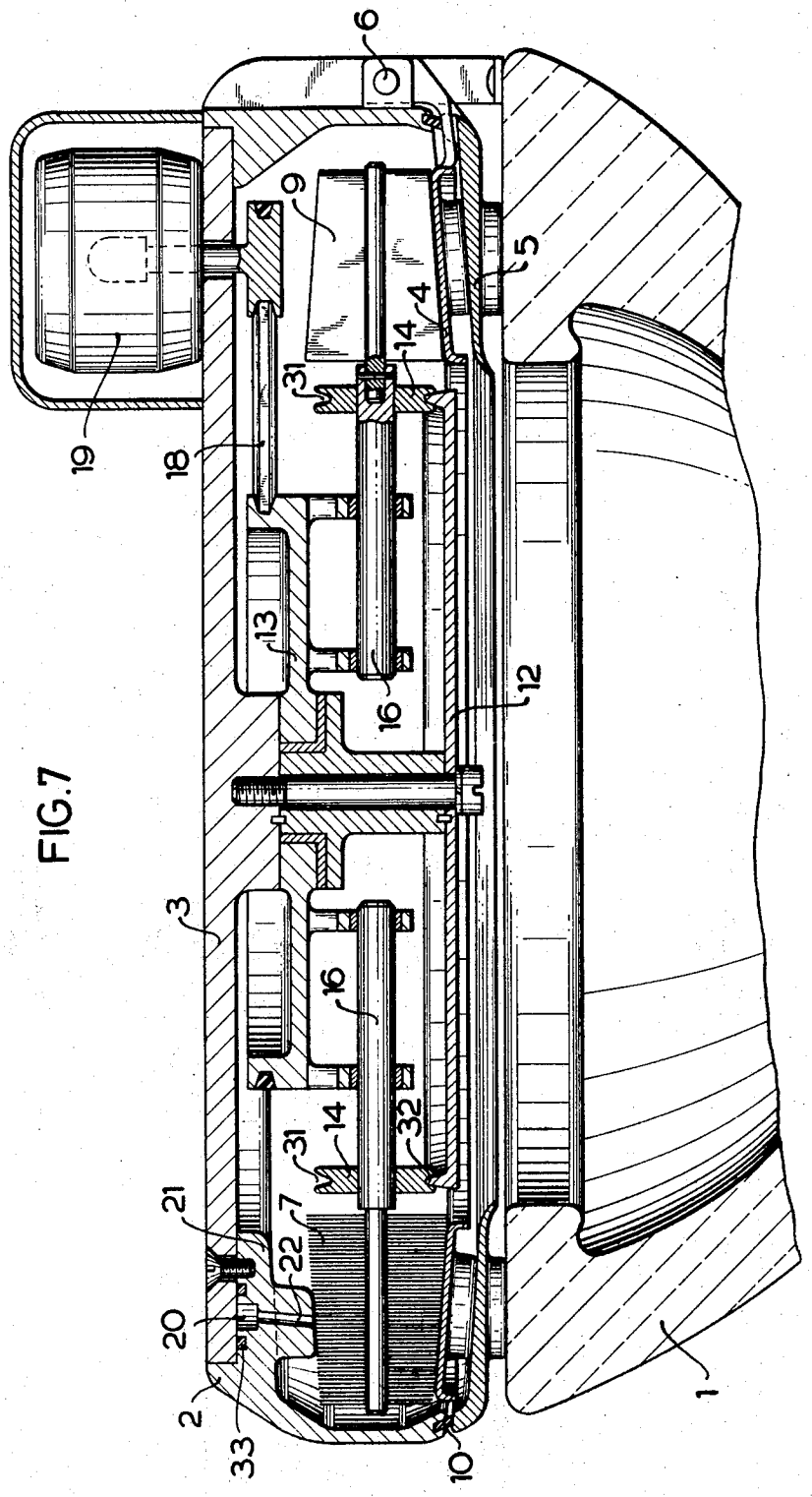


FIG.7

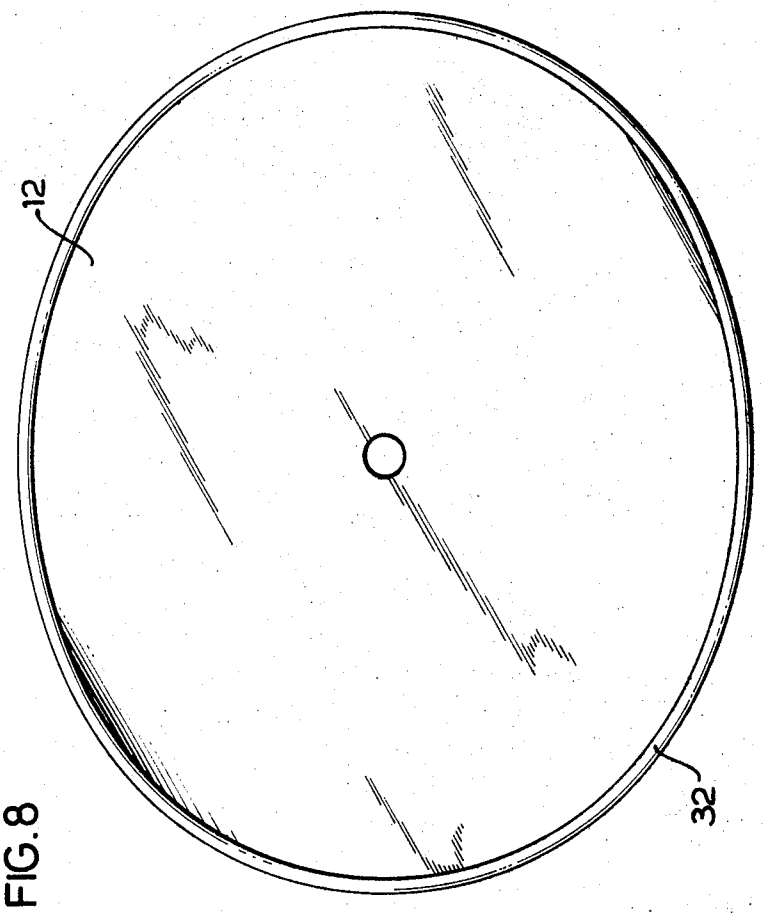


FIG.8

APPARATUS FOR AUTOMATICALLY CLEANING TOILET SEATS

The present invention relates to an apparatus for automatically cleaning toilet seats which is particularly suited for public rest rooms, rest rooms in restaurants, filling stations, and the like, where no personnel is available for a continuous servicing of the toilets.

It is an object of the present invention to provide a cleaning apparatus as set forth above which will make it possible to the user of the rest room, prior to or after use of the toilet, to initiate an automatic cleaning of the toilet seat without in any way contacting the cleaning means.

This object and other objects and advantages of the invention will appear more clearly from the following specification in connection with the accompanying drawings, in which:

FIG. 1 is a side view of a toilet body with installed cleaning device according to the invention.

FIG. 2 is a top view of the cleaning device of FIG. 1.

FIG. 3 shows the toilet body with upwardly folded cleaning device according to the invention.

FIG. 4 shows a toilet body equipped with the cleaning device according to the invention with the toilet seat folded upwardly.

FIG. 5 shows a toilet body equipped with a cleaning device according to the invention and with an upwardly folded lower section designed as run-off pan.

FIG. 6 is a longitudinal section through a cleaning device according to the invention with rotating brushes and reversibly arranged wipers.

FIG. 7 is a longitudinal section through a cleaning device according to the invention in which the brushes and the wipers are rotatable by means of friction discs.

FIG. 8 illustrates a top view of the cam disc shown in FIG. 7.

The cleaning device according to the present invention is characterized primarily in that it comprises a spraying device which is adapted to be folded upwardly and which comprises brushes and wipers, the spraying device being adapted to spray the toilet seat with a cleaning and disinfecting liquid and to clean the toilet seat with brushes and to dry the toilet seat by means of wipers. Preferably the arrangement is such that the spraying device which is equipped with the brushes and the wipers forms a structural unit with the toilet cover or lid and with the toilet seat. This can be realized in a simple manner by connecting the spraying device which comprises the brushes and the wipers to the toilet cover which is adapted to be folded upwardly. To avoid unnecessary pipes, it is suggested that a dosing device for admixing the disinfectant be likewise arranged on the toilet seat.

A further feature of the invention consists in that the spraying device will automatically be turned on in response to the closing of the toilet cover and will automatically be stopped after a predeterminable cleaning period.

To make sure that the cleaning and disinfecting liquid can flow off into the toilet bowl, it is advisable to arrange the toilet seat on a lower section which can be folded upwardly and which forms a run-off pan. The separating gap between the toilet cover and this lower section may in this instance be sealed by means of a

seal or by means of water repellent strips provided on the toilet seat and on the lower section so that no cleaning liquid can escape toward the outside. The brushes and wipers are adapted during the cleaning operation to carry out a circulatory or a reciprocatory movement by means of a cam shaped in conformity with the oval shape of the toilet seat, the brushes and wipers being held at a proper distance from the seat to be cleaned.

According to a particularly advantageous embodiment of the present invention, the brushes and the wipers are connected to a driving disc which is rotatably or pivotally mounted. In this connection it has been found advantageous to journal the wipers so as to be rotatable on a shaft and to provide the wipers with a plurality of wiper blades which by means of a control mechanism acting upon the wipers are alternately moved into wiping position.

A further embodiment of the invention consists in that the brushes and the wipers are roller-shaped and are subjected to a rotary movement by means of friction discs or gears rolling on the stationarily arranged cam disc. The driving disc for driving the brushes and the wipers is in this instance driven by a belt drive or the like which in its turn is driven by a drive motor.

To permit an easy exchange of the mechanical parts of the cleaning device whenever desired, the driving disc equipped with the brushes and wipers is together with the cam disc and the drive motor connected to an exchangeable cover plate of the toilet cover or lid. This embodiment makes it possible to provide the supporting flange for the cover plate with the passage for feeding the cleaning and disinfecting liquid. The open side of this passage or conduit is sealingly covered by the cover plate. The nozzles for spraying the cleaning and disinfecting liquid may, with this embodiment of the invention, be formed onto the bottom side of the supporting flange for the cover plate.

Referring now to the drawings in detail and FIGS. 1 and 2 thereof in particular, according to the arrangement shown in these figures, the spraying device equipped with the brushes 7 and the wipers 8 is designed as toilet cover 2 adapted to be folded upwardly. The cover 2 is by hinge means 6 connected to the toilet body 1 united with the toilet seat 4 and with the lower section 5 forming a run-off pan so that the spraying device together with the toilet seat 4 and the lower section 5 forms a structural unit. The toilet seat 4 and the lower section 5 are by means of the hinge means 6 pivotally connected to the toilet cover 2 as shown in FIGS. 3, 4 and 6 so that they can be folded upwardly individually. The drive motor 19 for driving the brushes 7 and wipers 8 is together with the dosing device 23 for admixing the disinfectant arranged on the rear part of the toilet lid or cover 2. The brushes 7 and the wipers 8 are driven by the drive motor 9 through the intervention of a belt drive 18 or any other suitable driving element or power transmission element.

According to the embodiment illustrated in FIG. 6, the brushes 7 and the wipers 8 are axially displaceably connected to a driving disc 13 forming a pulley. Disc 13 is adapted by means of the belt drive 18 to be driven by the motor 19 and to be rotated. The brushes 7 are designed in the form of rollers and by means of a shaft 26 are rotatably journalled. During a cleaning operation, the brushes 7 are rotated by means of a gear 24 which meshes with a gear ring 25 provided on the cam

disc **11.** The gear ring **25** is shaped in conformity with the oval shape of the toilet seat **4** and is laterally surrounded by the gear **24.**

Due to this design, the axially displaceable brushes **7** will always be held at a proper distance from the seating surface of the toilet seat **4.** The wipers **8** arranged on shaft **27** are likewise roller-shaped and are provided with a plurality of wiper blades **17.** The individual wiper blades will with each rotation be brought successively into wiping position by means of a control wheel **28** and a control tooth **29.** A roller **34** which engages a groove **30** of cam disc **11** and which is connected to shaft **27** keeps the wipers properly spaced from the seating surface of the toilet seat **4** and makes them follow the oval contour of the seat.

As shown in FIG. **7,** the cleaning device may, however, also be equipped with rotating wipers **9.** The roller-shaped brushes **7** and wipers **9** are respectively provided with a shaft **16** each, these shafts being rotatably journalled on the driving disc **13** and also being axially displaceable on the disc **13.** Connected to the shafts **16** is a friction disc **14** which by means of its groove **31** surrounds the elevated rim **32** of the cam disc **12.** The elevated rim **32** of cam disc **12** is shaped in conformity with the oval shape of the toilet seat **4** and establishes the proper distance of the brushes **7** and the wipers **9** from the seating surface of the toilet seat **4.** The oval design of the cam disc **12** is particularly clearly shown in FIG. **8.**

In order to simplify the assembly of the cleaning apparatus and the exchange thereof, the drive motor **19,** the driving disc **13** equipped with brushes **7** and wipers **8, 9** and the cam disc **11, 12** are connected to the cover plate **3** of the two-sectional toilet seat **2.** The cover plate **3** rests in this instance on a supporting flange **21** which is provided with a passage or conduit **20** for feeding the cleaning and disinfecting liquids. The open side of passage **20** is covered by the cover plate **3** and is sealed by means of seals **33.** The nozzles **22** for spraying the cleaning and disinfecting liquid are formed onto the bottom side of the supporting flange **21.** A seal **10** connected to the bottom side of the toilet cover **2** prevents the cleaning and disinfecting liquid from passing toward the outside through the separating gap between the toilet cover **2** and the lower section **5** forming the run-off pan.

It is, of course, to be understood that the present invention is, by no means, limited to the particular construction shown in the drawings but also comprises any modifications within the scope of the appended claims. Thus, instead of driving the cleaning apparatus by means of an electric motor, also other driving devices, for instance driving devices operable by water or spring power, may be employed.

What I claim is:

1. In combination with a toilet having a toilet body including a bowl, a seat and a lid pivotally connected to said toilet body and foldable selectively toward and away from said seat, a device for automatically cleaning the toilet seat, which includes: a cleaning unit comprising spraying means and brushes and wiping means and being foldable toward and away from said bowl, said cleaning unit being adapted to receive cleaning fluid and disinfectant and to spray the same onto the toilet seat, and actuating means operatively connected to said brushes and operable to cause said brushes to clean said seat and wipe it dry, and guiding means operable to guide said brushes and wiping means along a path corresponding to the contour of said toilet seat to thereby hold said brushes and wiping means in the desired spaced relationship with regard to said toilet seat, said brushes and wiping means being journalled for rotation about their axes and for reciprocation along their axes.

2. An arrangement in combination according to claim **1,** in which said cleaning unit is connected to and foldable together with said lid.

3. An arrangement in combination according to claim **1,** which includes dosing means for dosing out the desired quantity of disinfectant, said dosing means being arranged on said lid.

4. An arrangement in combination according to claim **1,** which includes motor means operatively connected to said cleaning unit, and also includes adjustable control means operatively connected to said motor means for controlling the running period of said cleaning unit.

5. An arrangement in combination according to claim **1,** which includes a run-off pan interposed between said seat and said toilet body and foldable toward and away from said toilet body.

6. An arrangement in combination according to claim **5,** which includes sealing means for sealing the gap between said toilet lid and said run-off pan in downwardly folded position of said lid which represents the closing position of said lid.

7. An arrangement in combination according to claim **6,** in which said sealing means include water deflecting portions arranged on said lid and said run-off pan and leading into said bowl.

8. In combination with a toilet having a toilet body including a bowl, a seat and a lid pivotally connected to said toilet body and foldable selectively toward and away from said seat, a device for automatically cleaning the toilet seat, which includes: a cleaning unit collectively comprising spraying means for dispering cleaning and disinfecting fluid and also comprising brushes and wiping means for drying thereof and collectively being foldable toward and away from said bowl, said cleaning unit being mounted on said lid forming a structured unit with the seat collectively to be assembled with said toilet body and being adapted to receive cleaning fluid and disinfectant and to spray the same onto the toilet seat, and actuating means operatively connected to said brushes and operable to cause said brushes to clean said seat and wipe it dry.

9. An arrangement in combination according to claim **1,** which includes rotatable driving disc means having said brushes and wiping means rotatably connected thereto.

10. An arrangement in combination according to claim **1,** which includes pivotally mounted driving disc means having said brushes and wiping means rotatably connected thereto.

11. In combination with a toilet having a toilet body including a bowl, a seat and a lid pivotally connected to said toilet body and foldable selectively toward and away from said seat, a device for automatically cleaning the toilet seat, which includes: a cleaning unit comprising spraying means and brushes and wiping means and being foldable toward and away from said bowl, said cleaning unit being adapted to receive cleaning fluid and disinfectant and to spray the same onto the toilet seat, and actuating means operatively connected

to said brushes and operable to cause said brushes to clean said seat and wipe it dry, the wiping means comprising radially extending wiper blades, and control means provided which are operatively connected to said wiping means and are operable to move alternate wiper blades into their wiping position.

12. In combination with a toilet having a toilet body including a bowl, a seat and a lid pivotally connected to said toilet body and foldable selectively toward and away from said seat, a device for automatically cleaning the toilet seat, which includes: a cleaning unit comprising spraying means and brushes and wiping means and being foldable toward and away from said bowl, said cleaning unit being adapted to receive cleaning fluid and disinfectant and to spray the same onto the toilet seat, and actuating means operatively connected to said brushes and operable to cause said brushes to clean said seat and wipe it dry, said brushes and wiping means being roller-shaped, and wheel means and cam means, said wheel means being rotatably connected to said brushes and wiping means being in guided arrangement with said cam means.

13. An arrangement in combination according to claim **1**, in which said actuating means forms a driving disc, and which includes transmission belt means and a drive motor drivingly connected to said driving disc by means of said transmission belt means.

14. An arrangement in combination according to claim **13**, in which said toilet lid includes a cover plate exchangeably arranged in said lid and having mounted thereon said motor and said wiping means and brushes and driving means therefor.

15. In combination with a toilet having a toilet body including a bowl, a seat and a lid pivotally connected to said toilet body and foldable selectively toward and away from said seat, a device for automatically cleaning the toilet seat, which includes: a cleaning unit comprising spraying means and brushes and wiping means and being foldable toward and away from said bowl, said cleaning unit being adapted to receive cleaning fluid and disinfectant and to spray the same onto the toilet seat, and actuating means operatively connected to said brushes and operable to cause said brushes to clean said seat and wipe it dry, said actuating means forming a driving disc, transmission belt means and a drive motor drivingly connected to said driving disc by means of said transmission belt means, said toilet lid including a cover plate exchangeably arranged in said lid and having mounted thereon said motor and said wiping means and brushes and driving means therefor, said lid including flange means for supporting said cover plate, said flange means comprising passage means for feeding cleaning fluid and disinfectant to said brushes and wiping means and being sealed toward the outside by said flange means.

16. An arrangement in combination according to claim **15**, in which said cleaning unit includes nozzle means operable to spray cleaning fluid and disinfectant toward the bottom side of said flange means.

* * * * *