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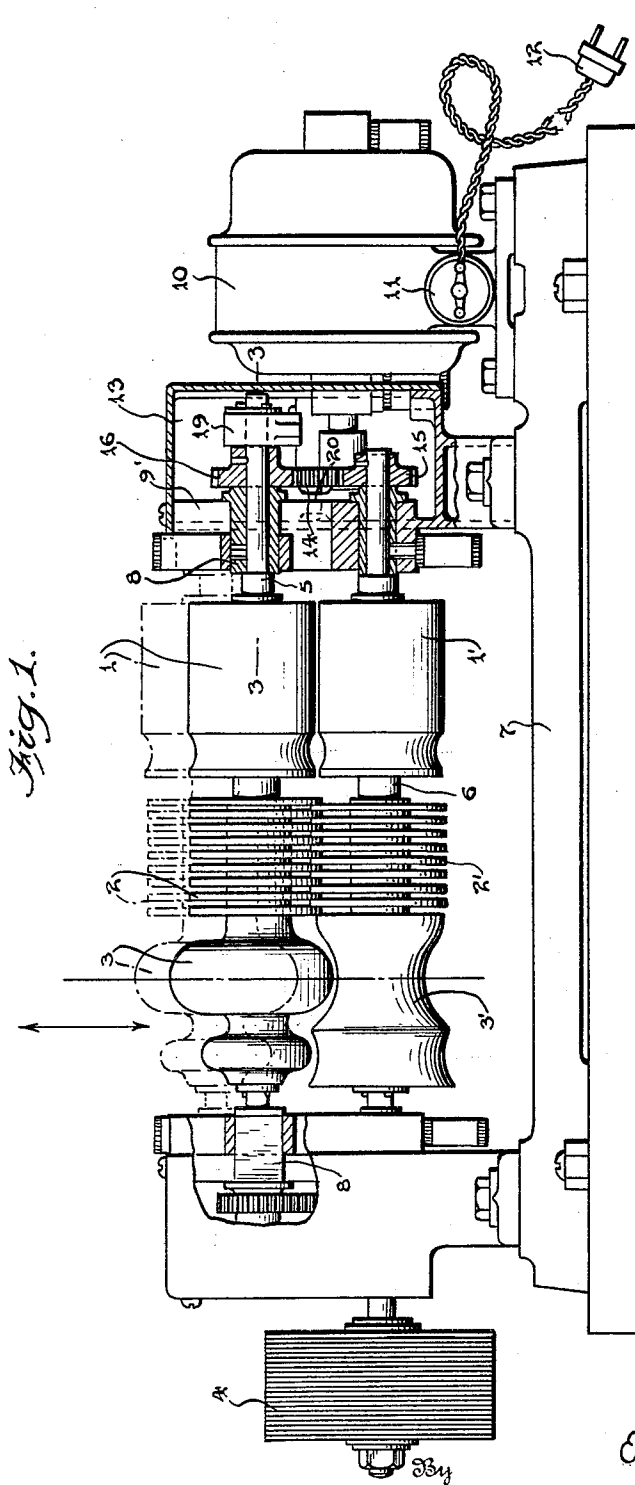
V. NARDI

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SPOON, KNIFE, AND FORK POLISHING MACHINE

Filed May 29, 1930

2 Sheets-Sheet 1



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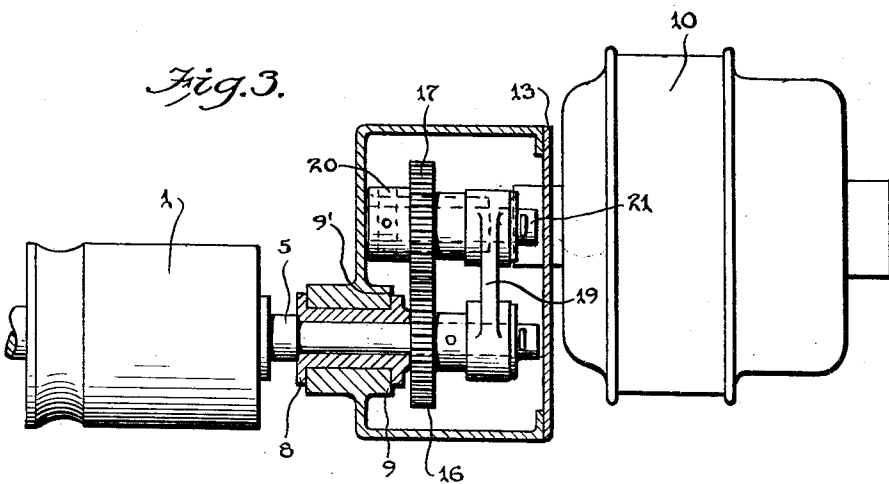
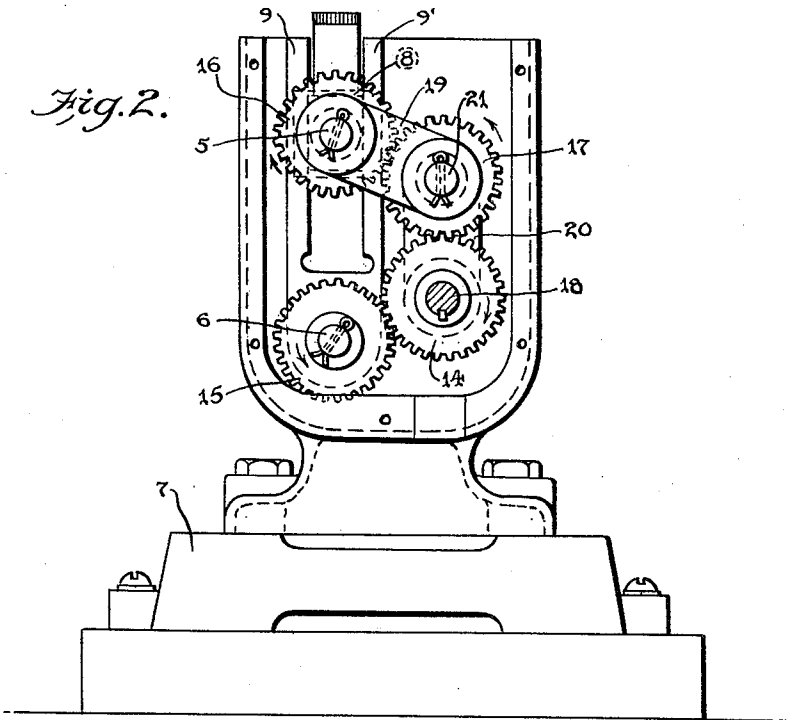
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UNITED STATES PATENT OFFICE

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SPOON, KNIFE AND FORK POLISHING MACHINE

Application filed May 29, 1930, Serial No. 457,460, and in Italy June 4, 1929.

This invention relates to table silverware cleaning and polishing machines, in which one or more revolving pieces of felt or similar material clean the knife, spoon or other implement which is kept in contact with them.

The main object of the invention is to provide a machine which is able to clean any type of knife, fork or spoon, of whatever form or size, without any operation other than presenting the piece to the machine and pushing it against the same.

In carrying out the invention, there is provided a number of pairs of felt discs or rollers or generally revolving members of convenient shape, which rotate in opposite directions, so that when a fork or spoon is introduced between a pair of members it becomes cleaned and polished on account of rubbing and burnishing of the felt or wool surface upon the piece. Another feature of the invention consists in providing means for keeping an adequate pressure between the elements of a pair of members, so that the distance between said bodies may vary and adjust itself to the size of the introduced piece and to the state of wear of the cleaning discs or members.

The invention will be fully understood upon reference to the accompanying drawings, in which:

Figure 1 is a side elevation of a cleaning machine embodying the present invention, with the gear box on the driving side sectioned.

Fig. 2 is a vertical transverse section through a gear box, showing diagrammatically the means for varying automatically the distance between shafts.

Fig. 3 is a horizontal sectional view taken on line 3—3 of Fig. 1.

The machine as illustrated is fitted with three pairs of cleaning members 1—1', 2—2', 3—3' and with a polishing disc 4, the upper members 1, 2, 3 being carried by a shaft 5, and the other members 1', 2', 3' being carried by another shaft 6. Both of said shafts are journaled in bearings on the frame 7 of the machine, and the upper shaft 5 is arranged so as to be slidable vertically, since

each of its bearings is carried by a slider 8 movable between guides 9', 9'' of the frame 7. Said frame 7 carries an electric motor 10 and a switch 11, and a plug 12 takes the current from the network supply. A gear box 13 is provided between the motor and the cleaning members, and it contains a gear mechanism which transmits the power of the motor to the shafts, notwithstanding the relative displacement of said shafts, and which tends at the same time to push the shafts toward each other. This is obtained by the arrangement shown in Fig. 2. The gear mechanism, in this embodiment consists of four toothed wheels 14, 15, 16, 17 meshing with one another and arranged in such a relative position that, as a result of the driving torque transmitted through them from the driving shaft 18 (connected with the motor 10) to the shaft 5, a downwardly directed effort is exerted on the shaft 5, such that this shaft 5 is urged against shaft 6, whatever may be the distance between said shafts.

The toothed wheels are assembled together by means of arms or cranks 19, 20, which are journaled mounted on the pivots or shafts of said wheels. More particularly, wheels 16 and 17 are connected by arm 19, journaled on shaft 5 and on pivot 21 of wheel 17; wheels 17 and 18 are connected by arm 20, journaled on pivot 21 and on driving shaft 18; wheels 18 and 15 are connected by the frame 7 of the machine, which acts here as connecting link; and wheels 15 and 16 are displaceably connected by the frame and the sliding means 8, 9.

The driving shaft 18 receives motion from the motor and transmits it through the toothed wheels 14, 15 to the shaft 6 mounted on fixed bearings. The wheel 14 meshes with the wheel 17, the pivot 21 of which may swing about the axis 18 to which it is connected by means of links 20. The toothed wheel 17 meshes with the wheel 16 keyed on the shaft 5 which may slide along the guide 9. A link 19 connects the wheels 16 and 17. When the wheel 18 turns in a clockwise direction, as indicated by the arrow, the driving torque on the shaft 21 results in turning the wheel 17 in a counter-clockwise

direction, as shown by the arrow, and the shaft 21 itself being urged to the right. The wheel 17 transmits its motion to the wheel 16 and the driving torque has the effect of turning said wheel 16 clockwise, as shown by the arrow, and of urging the shaft 5 downwardly. The motion of wheel 14 has, therefore, the effect of lowering said shaft 5, pressing it towards the parallel shaft 6.

The use of the machine is very simple: the switch 11 is closed after the plug 12 has been inserted into the corresponding socket. The shafts carrying the felt members turn quickly and the spoon or other piece inserted between the corresponding members is polished very carefully on account of the high speed of rubbing. The motion of said members is directed so as to push out the inserted piece on which a certain effort is required to maintain it between the members; but the effort against the members results in an absorption of power from the motor through the gear mechanism; the increased torque of motion in said gear mechanism generates a downwardly directed resultant force that urges the shaft 5 towards the shaft 6, pressing the piece between them. When the rubbing or friction resistance is high, the transmitted torque is increased, and the downwardly directed resultant force on the shaft 5 increases.

The advantages that the system offers are: no damage to the silver pieces on account of the fact that no gritty or abrasive substance is used; a very beautiful brilliance due to the high rubbing speed combined with an exact pressure; a rapidity of operation due to the fact that each spoon or fork or knife has a corresponding pair of members; and adjustment of the pressure upon the piece is unnecessary on account of the special gear mechanism.

What I claim is:—

1. The combination, in a cleaning and polishing machine, of a pair of cleaning members, two parallel shafts carrying said members, one of said shafts being rotatably mounted in fixed bearings and the other shaft being displaceably mounted, and means including a gear train for rotating said shafts and for urging said displaceable shaft toward said fixedly mounted shaft.

2. The combination, in a cleaning and polishing machine, of a pair of cleaning members, a motor, a driving shaft operated by the motor, a toothed wheel mounted on the driving shaft, a fixedly mounted rotary shaft carrying one of the cleaning members, a second toothed wheel keyed on the fixed shaft and adapted to cooperate with the first toothed wheel, an arm pivotally mounted on said drive shaft and carrying a pivot at the free end thereof on which is rotatably mounted a third toothed wheel in mesh with the toothed wheel mounted on the drive

shaft, a link pivotally mounted on the pivot at the free end of the arm, a shaft carried by the free end of the link and displaceable relative to the fixed shaft, a fourth toothed wheel fixed on the displaceable shaft and in mesh with the third toothed wheel, said displaceable shaft having the other cleaning member mounted thereon, means for guiding the displaceable shaft in a direction to and from the fixed shaft, said toothed wheels being so related that rotary motion of the drive shaft will urge the displaceable shaft toward the fixed shaft.

In testimony whereof, I affix my signature.

VALENTINO NARDI.