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TIME SWITCH PROVIDED WITH A MAGNETIC EDDY CURRENT
BRAKE IN WASHING OR RINSING MACHINES
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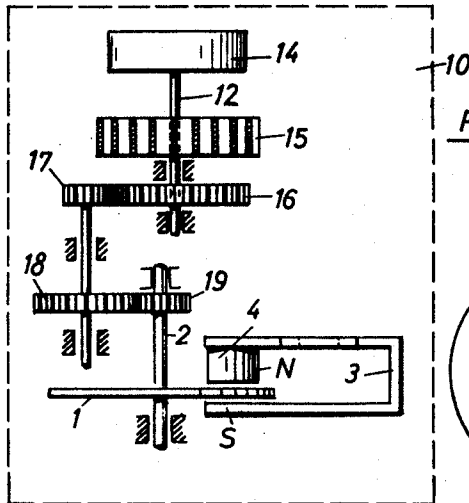


FIG. 1.

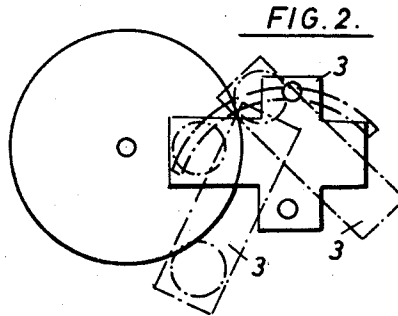


FIG. 2.

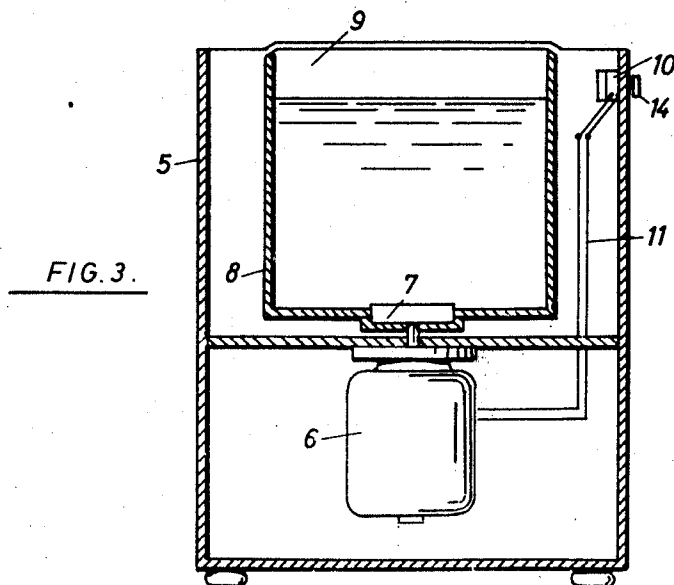


FIG. 3.

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TIME SWITCH PROVIDED WITH A MAGNETIC EDDY CURRENT BRAKE IN WASHING OR RINSING MACHINES

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2 Claims. (Cl. 310-93)

This invention relates to a time switch provided with a magnetic eddy current brake, and is particularly intended for use with washing or rinsing machines.

The object of the invention is to provide the time switch with a brake magnet in such manner, and to arrange the time switch in the washing or rinsing machine in such a way that with increasing temperature of the washing liquid or goods washed a quicker completion of the washing or rinsing operation is achieved.

For washing machines it is advisable that the braking lessens when the washing medium are sufficiently heated, so that the speed of the washing operation increases with the increasing heat of the washing medium, and that, on the other hand, when the goods to be washed are still cold or comparatively cold, the run off or period of operation of the time switch is retarded with the result that the action of the magnetic eddy current brake is rendered more effective.

It is expensive and complicated to regulate the washing process while it is going on in known manner with the aid of thermo-electric cells. The invention, therefore, has for its object to achieve the control of the washing process automatically, without such additional means, in conformity with the increase in heat or the lessening of the heat of the washing liquid or goods washed.

The invention solves the problem by using as brake magnet a ceramically bound magnet.

A peculiarity of ceramically bound magnets, for example oxide magnets, resides in the feature that the intensity of field of these magnets considerably lessens when the temperature increases, or that the intensity of field increases when the temperature goes down. As the brake power quadratically depends upon the intensity of field, the variation in temperature of such ceramically bound magnets automatically affects the working of such magnetic braking means based, according to the invention, upon the working principle of an eddy current brake.

The invention, therefore, arranges the time switch in the area where the heat is most active, i.e. in the vicinity of the washing liquid or of the goods washed.

According to the invention the time switch is, therefore, arranged directly at the washing machine, and as also in rinsing machines (for dishes or the like) the goods to be washed are always in close vicinity of the time switch. In these machines the switch is always reliably acted on by the heat radiated by the washing liquid or the goods washed, whereby it is possible to control to a certain extent the effect produced by the radiation by the proper selection of the distance at which the time switch is arranged from the source of heat.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawings, forming a part of this specification and in which an embodiment of the invention has been shown by way of example. However, I wish to say that the invention is not confined to any strict conformity with the showing of the drawings,

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but may be changed or modified, so long as such changes or modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawings:

Fig. 1 is a diagrammatic front view of an eddy current brake;

Fig. 2 is a top view of the eddy current brake of Fig. 1 in various positions of the brake magnet;

Fig. 3 shows how the time switch may be arranged in a washing machine.

Referring now to the drawings in detail, Fig. 1 shows a time switch indicated generally at 10, which incorporates a brake disk 1 made of current-conducting but not magnetically conducting material. 2 is the shaft of the brake disk 1, which shaft is connected via a gear arrangement 16, 17, 18, 19 with the switch shaft 12 which carries a knob 14 and a spring 15, the gearing being such that the disk 1 will rotate at a higher speed than the switch shaft 12.

3 is the preferably U-shaped bridge piece of the magnet, while 4 is the magnet proper, which (as shown in Fig. 1) is preferably of circular formation and ceramically bound. The magnet is inherently temperature-responsive in that its magnetic strength decreases when the magnet is subjected to heat and increases when the magnet is allowed to cool.

It is understood that the possibilities of the ceramical binding can also be utilized for the purpose that, for example, the edge zones of the magnet are provided with a larger field density, in order to obtain by means of a large number of dispersion lines an increased braking effect.

From the illustration of Fig. 2 it will further be seen that the bridge piece 3 can be swung away from the brake disk 1 to such an extent that the magnet is no longer in contact with the brake disk, so that the brake power is practically reduced to naught, while in the middle position the brake power is most effective.

Fig. 3 shows an embodiment of the present invention in which the washing machine comprises an outer casing 5, a driving motor 6 for actuating the machine, this motor 6 being connected to a pulsator 7; a container or receptacle 8 for receiving the treating medium, i.e., the washing liquid 9; the above-described time switch 10 the knob 14 of which is shown as being externally accessible; and an electrical connection 11 interconnecting the motor 6 and the time switch. While the time switch and brake are shown as being disposed near the top of the outer casing 5, it will be understood that any other suitable location may be selected, as, for example, near the bottom of the casing.

Fig. 3 shows clearly that the air gap between the container 8 and the outer casing 5 acts as heat-insulating means, so that heat is accumulated in the area between the container 8 and the outer casing 5, and that the magnet of the eddy current brake of the time switch 10 is acted on by the heat radiation in such manner that the brake means are less effective at higher temperatures and more effective at lower temperatures, i.e., the location of the time switch and brake is so selected that the magnet of the brake is arranged in the zone of heat radiation emanating from the receptacle 8 so that the hotter the washing or other treating medium in the receptacle, the weaker the magnet and consequently the lower the braking effect of the eddy current brake and the shorter the period of operation of the timing switch, and, conversely, the colder the treating medium in the receptacle, the stronger the magnet and consequently the greater the braking effect of the eddy current brake and the longer the period of operation of the timing switch.

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As range of application of the invention may be considered all cases in which time switches are employed in cooperation with brake means, and in which the possibility exists to arrange the time switch in the vicinity of sources of heat, and in which at increasing heat a quicker run off of the time switch is desired.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In a washing machine, the combination which comprises: a receptacle for receiving a treating medium; a motor for actuating the machine; a timing switch in circuit with said motor; and a magnetic eddy current brake associated with said timing switch for retarding its period of operation, said eddy current brake including an inherently temperature-responsive magnet the magnetic strength of which decreases when the magnet is subjected to heat and increases when the magnet is allowed to cool, said magnet being arranged in the zone of heat radiation emanating from said receptacle, whereby the hotter the treating medium in said receptacle, the weaker the magnet and consequently the lower the braking effect of said eddy current brake and the shorter the period of operation of said timing switch, and, conversely, the colder the treating medium in said receptacle, the stronger the magnet and consequently the greater the braking effect of said eddy current brake and the longer the period of operation of said timing switch.

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2. The combination defined in claim 1 wherein said magnet is a ceramically bound magnet.

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