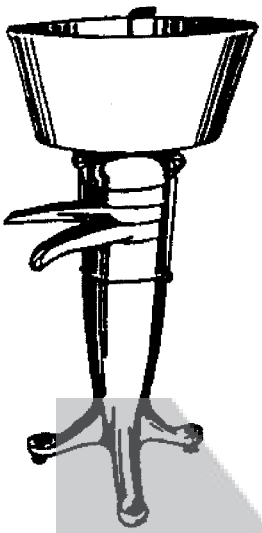
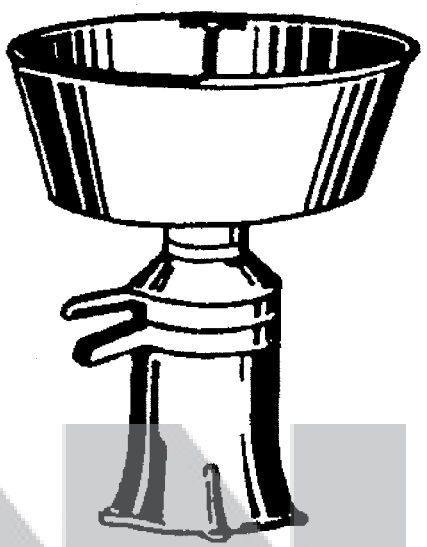
FULLWOOD

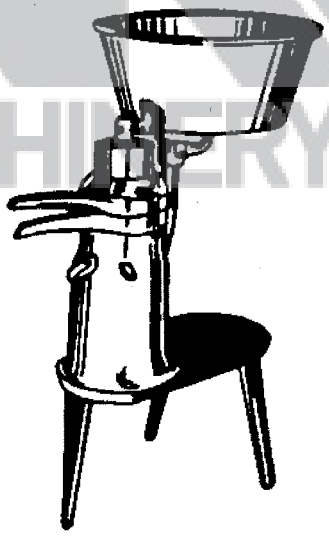
THE ELECREM RANGE OF CREAM SEPARATORS



ELECREM 5



ELECREM 1



ELECREM 3

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INTRODUCTION

There are three motor driven models of the Elecrem available : -

The model number is the first figure on the plate.

ELECREM 1, with 27 gallons (125 litres) per hour throughput. Receiving vessel capacity 2.1/4 gallons (10 litres). 19 plates.

ELECREM 3, with 70 gallons (315 litres) per hour throughput. Receiving vessel capacity 5 gallons (22 litres). 31 plates.

ELECREM 5, with 110 gallons (500 litres) per hour throughput. Receiving vessel capacity - two sizes available, standard 11 gallons (50 litres), integral or wall mounted 30 gallons (140 litres), 46 plates. (Later models 43 plates). 39 plates from 1991 onwards.

The motors are 220 volts, single phase, but 110 volt motors can also be fitted, in which case the regulator is supplied with a transformer incorporated. The separators are fitted with an anti-froth system which permits a much finer adjustment of the screw for thickness regulation and a more compact cream is obtained.

The parts in contact with the milk are made from rust-proof anodised aluminium.

The motor speed is variable over a range of 7,000 - 10,000 r.p.m.

PRINCIPLES OF SEPARATION

The fat in milk is in the form of small globules dispersed in the liquid phase and can move through it. Because the fat globules have a density less than the liquid (skim) phase, they will of their own accord rise and float to the top. Gravity exerts a greater force on the heavier skim phase, pulling it downwards and displacing the fat which becomes the surface layer of cream.

Mechanical separators using centrifugal force increase the gravitational pull, increasing the difference in the densities or weights of the fat and skim enabling them to separate quicker and more efficiently.

The functional part of any separator is the BOWL which contains a series of PLATES stacked very close together which, when rotated at high speed, divide the milk into thin films through which the fat can pass easily and quickly. Whole milk enters the bowl through the top and passes via the distributor to the bottom of the bowl. Centrifugal force throws the skimmed milk (the heavy fraction) to the outside of the bowl, upwards and out through the skim outlet HOLES to the skim spout. The lighter cream remains in the centre and travels upward and out through the cream outlet screw to the cream spout. The two fractions are kept apart by the PARTITION. Skim milk flows over the top surface whilst the cream is contained below. This partition contains the CREAM SCREW which partially controls the thickness of the cream. By turning the screw the resistance is altered, thus if the screw is turned in there is a greater resistance to the cream coming out thereby holding the cream in the bowl slightly longer and allowing more skim to be thrown out resulting in a thicker cream. Also the concentration of the fat is greater at the the centre of the bowl so that the nearer the centre the cream screw outlet is positioned, the richer the cream will be.

Although the separator should take virtually all the fat out of the milk, the cream will still be a mixture of fat and skim so that 35% cream is, in fact, 35% fat and 65% skim but it does contain the whole of the fat from the milk.

- Fat globule size.
  The bigger the globule the better the separation.
- Temperature.
  Milk will separate best as soon as it leaves the animal, i.e. at body temperature 37°C (98°F) but if it has to be re-warmed it should be at approximately 43°C (100°F).
  When warm the viscosity of the milk is lower and also the fat globules tend to expand.
- Separator slime.
  If the separator is allowed to run for too long a period without flushing or stripping, a layer of slime may form on the bowl parts. This slime consists of dirt, cell debris, etc. and is the heavier than milk fraction. It tends to clog the plates etc. and can be the cause of a number of operational problems such as fluctuations in the cream percentage, uneven thickness, loss of fat, operational difficulties and motor failure due to overloading.
  It is recommended, therefore, that the machine should only be run for periods of 20 - 30 minutes, after which time the plates should either be cleaned by running hot water through the machine while it is still running or if more cleaning is required the motor should be stopped and the separator bowl stripped down and the plates cleaned before re-assembling and re-starting. The actual time the machine may be allowed to run will depend on factors such as the thickness of cream being produced and the cleanliness of the milk. Many of our customers find that they can run their machines for longer periods without any ill effect - up to an hour is frequently recorded.
  Only clean, fresh, filtered milk should be used.
- Steadiness of bowl.
  It is essential that the bowl runs smoothly and evenly. If the bowl is allowed to vibrate during separation a re-mixing of the cream and skim occurs which results in inefficient skimming and a thinner cream will be produced. The bowl may be balanced by adjusting the three retaining screws.
- Rate of inflow.
  Each separator has a rated capacity of a certain quantity of milk per hour. This throughput is important and, therefore, at all times the float, which controls the flow rate, must be in position and the tap left in the fully open position.

OPERATING THE SEPARATOR

The separator should be set up level and fixed firmly to a solid base. The Elecrem 1 is designed to be fastened direct to a table or bench top. The surface beneath the motor housing should be kept dry as damage may occur to the motor if liquid is drawn upwards.
Number 3 has its own stand provided which again should be fixed firmly to a working surface.
Number 5 is designed for fastening direct to a floor.
The separator bowl is normally wedged in position to avoid damage during transit. These wedges should be removed before the separator is used.

Assembly of separator bowl.
The base is first fitted with a rubber 'O' ring. It is important that this is inspected periodically and replaced if found to be worn or distorted. Next, the plates are assembled on the base. These will locate into the right position and may be assembled in any order. The partition carrying the cream screw is now placed over the plates followed by the bowl cover. The locking nut is next screwed on, but before tightening it is important that the two 'O's stamped one in the base and the other in the cover are in line and adjacent to one another. Finally, tighten the locking nut with the spanner provided and finish by striking the spanner handle a few light blows on the edge of the bench. See figure 1.

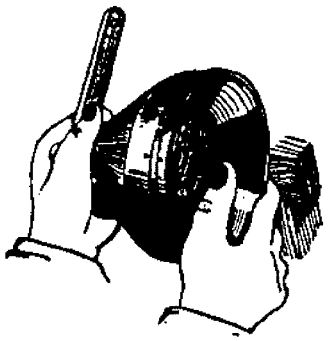


Fig 1

The procedure is reversed for unscrewing the locking nut. See figure 2.

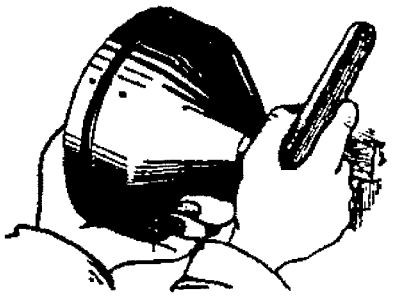


Fig 2

For a trial run the cream screw should be about level with the partition, i.e. neither too far in nor out. Turning the crew by means of the fitment on the spanner alters the thickness of the cream.
See figure 3.

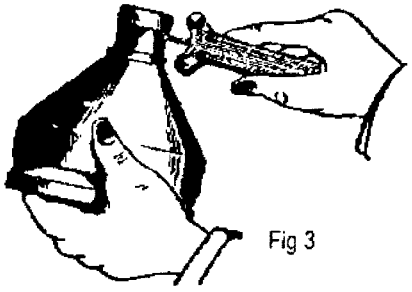


Fig 3

Clockwise (in) increases the thickness whilst screwing out results in a thinner cream. This cream screw should not be altered more than necessary.

General assembly.

Before fitting the separator bowl over the cone end of the motor shaft, ensure that both the cone itself and the aperture in the base are dry. If fitting is carried out when wet, there is a possibility of bowl slip which may result in cream thickness inconsistency.
It should also be noted that when fitting the bowl do it positively and make sure that it is solid on the drive.
The cream and skimmed milk spouts are fitted next, skim first followed by the cream spout (these will only fit in the right sequence). Next the milk collecting funnel is fitted, into the top of which the stainless steel float is located.
The way the milk receiving bowl is sited varies according to the model. Model 1 has the bowl sitting on top of the milk funnel with a tap in the centre of the bowl. There is a mark on the rim of the bowl towards which the handle of the tap should be pointed for the open position.
Model 3 has the bowl on a stand attached to the motor housing. The tap is located on the outside of the bowl and this should be sited over the milk funnel where again the float is able to control the flow of milk from the tap.
The bowl fitting on model 5 is similar to the number 1 except that spring loaded rods hold it in position.

Controller.

Now your separator is assembled the lead from the motor should be plugged into the outlet socket of the controller. The input lead of the controller should be fitted a standard 3 pin plug suitable for mains operation. The controller is also fitted with an ON/OFF switch. With the speed control knob set on - the motor runs at its lowest speed. Turning the knob clockwise will increase the motor speed until the pointer reaches the + mark which signifies maximum speed.
The faster the motor speed the thicker the cream produced should be. Together with the cream screw these are the two adjustments whereby the required thickness of cream is obtained.
At first it is a case of trial and error. It is recommended that the services of a dairy are sought in order to know for certain what percentage cream your machine is giving. Once the correct percentage cream is reached it should continue to be of the same consistency as long as the settings remain the same.
If two types of cream are required, the purchase of a second partition with cream screw will enable this to be achieved without the need to alter the cream screw each time. It is a simple matter to keep a record of the setting of the knob on the controller.

Operation.

With the tap in the closed position, fill the receiving vessel with warm milk 37°C (98°F), switch on the motor and allow to reach full speed before opening the tap for the milk to enter the machine. Separation should now take place. The skim milk will emerge from the separator first and it may take a short while before the cream is seen to come into the spout. Suitable receptacles should be placed under the respective spouts to collect the two fractions. Keep the receiving vessel topped up with warm milk and close the tap before allowing it to run dry. Do not stop the motor whilst there is still milk in the receiving vessel without first closing the tap.

Flushing.

In order not to waste any cream left in the machine at the end of separation, close the tap as soon as the milk receiving vessel is empty and pour in about a litre (2 pints) of warm water. Now open the tap and continue to collect the cream from its spout until it shows signs of thinning, then replace the cream collecting receptacle with another one to collect any rinse water. This also serves as a pre-rinse prior to stripping down the machine for washing.

Cleaning.

Take the machine apart and wash all pieces in warm water to rid them of milk and cream residues. If difficulty is experienced in separating the top and bottom parts of the bowl, turn the bowl over and tap the threaded part on a block of wood. See figure 4.

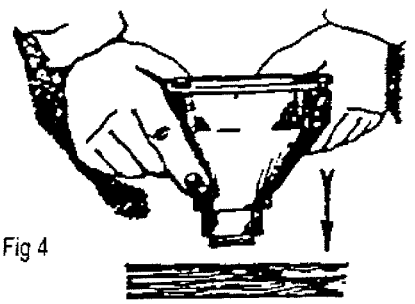


Fig 4

Next wash the parts in hot water containing a suitable mild detergent or liquid soap. DO NOT use alkaline dairy detergent nor an acid based cleaner as these will adversely affect the metal parts.

A useful cleaner may be made from a solution containing 8 parts of washing soda to 1 part water softener (Calgon). After washing, rinse in clean water and finally scald in boiling water. A small brush is provided to ensure the various holes on the machine are kept clean.

MAINTENANCE

There is little maintenance required with these machines. The motor incorporates sealed pre-packed bearings which do not need lubrication. It is mounted on rubber grommets and, therefore, a certain amount of float is normal.
Periodically the brushes in the motor will need replacing. The 'O' ring in the base of the separator bowl must not be allowed to deteriorate or distort.
All parts must be kept in a clean condition.

FAULT FINDING

- SEPARATOR BOWL DOES NOT RUN SMOOTHLY : - Machine not assembled correctly. Separator bowl incorrectly assembled. Rubber 'O' ring not in position. Plate short. Not tightened sufficiently. Cone etc. still wet.
- MILK COMES OUT OF HOLE IN BASE : - Separator bowl incorrectly assembled. 'O' ring not in position. Locking nut not tight enough.
- CREAM TOO THIN : - Cream screw too far out or even missing. Speed of motor too slow. Plate short in bowl. Temperature of milk not correct, too hot or too cold.
- CREAM TOO THICK : - Cream screw over tightened. Motor speed is too fast. Milk is too cold. Milk inlet tube in float chamber is partially blocked.
- OVERALL POOR OPERATION : - Float may be punctured. Cream screw too tight. Carbon brushes on motor worn. Milk temperature incorrect.

CREAM STANDARDS

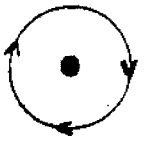
The minimum milk fat content of the various cream is laid down in the cream regulation and is defined as below : -

Clotted cream	55% Fat	Sterilised cream	23% Fat
Double cream	48% Fat	Single cream	18% Fat
Whipping/whipped cream	35% Fat	Half cream	12% Fat

The legal definition of skimmed milk states that it should not contain more than 0.3% fat.
To calculate the yield of cream from a given quantity of milk it is necessary to know the fat percentage of the milk.
A simple example shows that 10 gallons of milk containing 3.5%fat should yield 1 gallon of 35% cream.

Rotation of Motor

Looking down on to the shaft, the motor should turn clockwise.



DIMENSIONS AND WEIGHTS (APPROXIMATE)

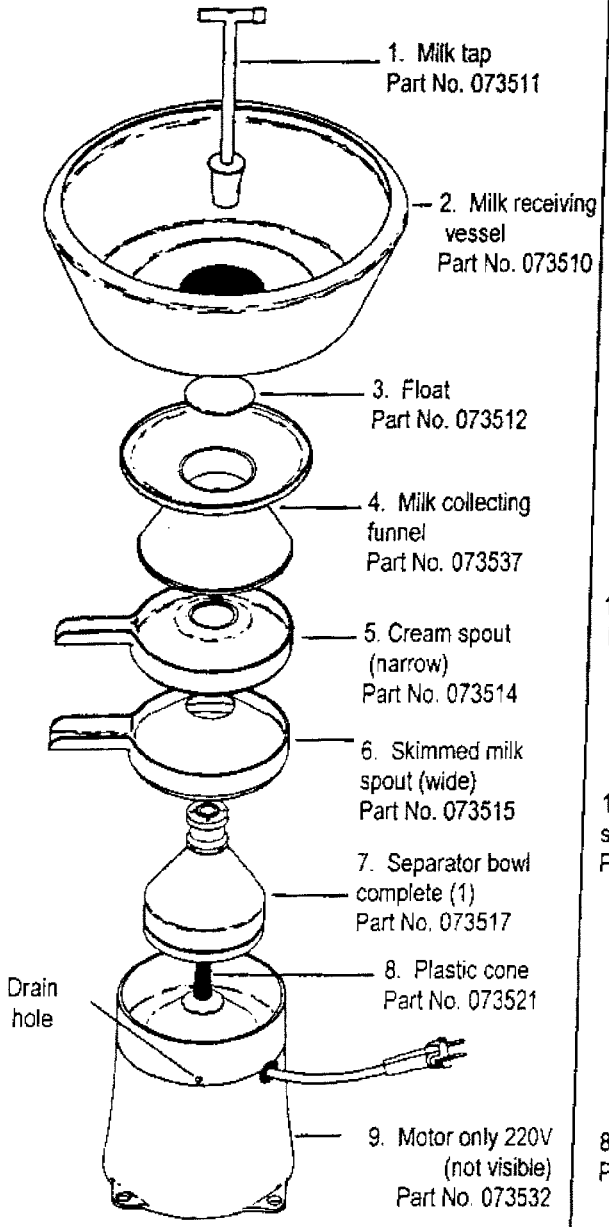
	DIMENSIONS			WEIGHTS	
MODEL	*OVERALL HEIGHT*	*HEIGHT TO SKIM SPOUT*	*OVERALL WIDTH*	*SEPARATOR*	*SEPARATOR PLUS ACCESSORIES*
1	19¼ in 49 cm	7 in 18 cm	14½ in 37 cm	10 lbs 5 kilos	15½ lbs 8 kilos
3	36¼ in 92 cm	21 in 53 cm	20 in 51 cm	31 lbs 14 kilos	36½ lbs 16.6 kilos
5 with standard bowl	42 in 107 cm	21 in 53 cm	23½ in 60 cm	19 lbs 8.6 kilos	27½ lbs 12.5 kilos

The number 5 model may be supplied with a larger milk receiving tank if desired. This tank measures 31½ x 18 x 18 in (80 x 46 x 46 cm) and weighs 22½ lbs (10.2 kilos) It is designed for wall mounting. Part number 073664.

N.B.

1. Dimensions include milk receiving vessel where appropriate.
2. 'Separator weight' is separator only and does not include the controller. Accessories include controller, tools, etc.

ELECREM SEPARATOR 1 Part No. 073500



MOTOR SPARES

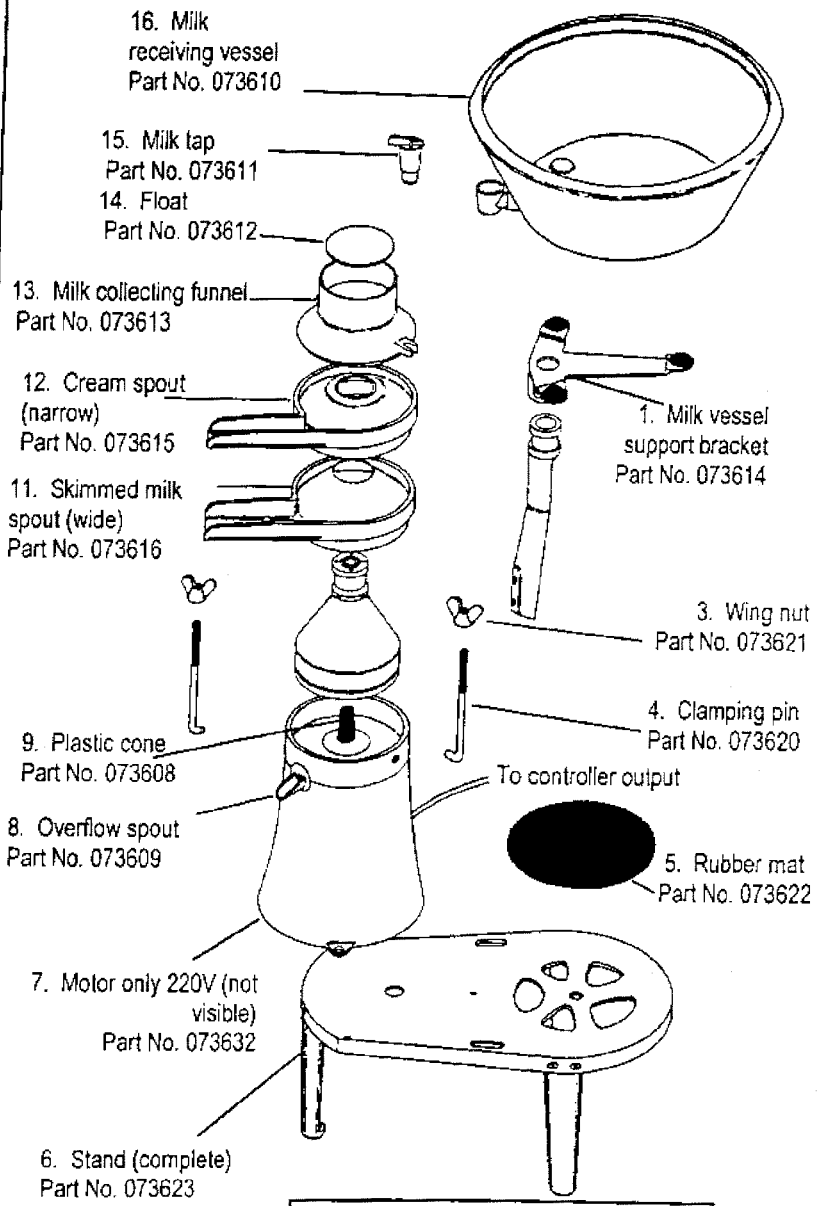
Carbon brush (2 per motor) 073520

Capacitor for 220V motor 073534

Rubber grommet (motor mounting) (3 per motor) 073522

Carbon brush & holder for new motor 073647

ELECREM SEPARATOR 3 Part No. 073650



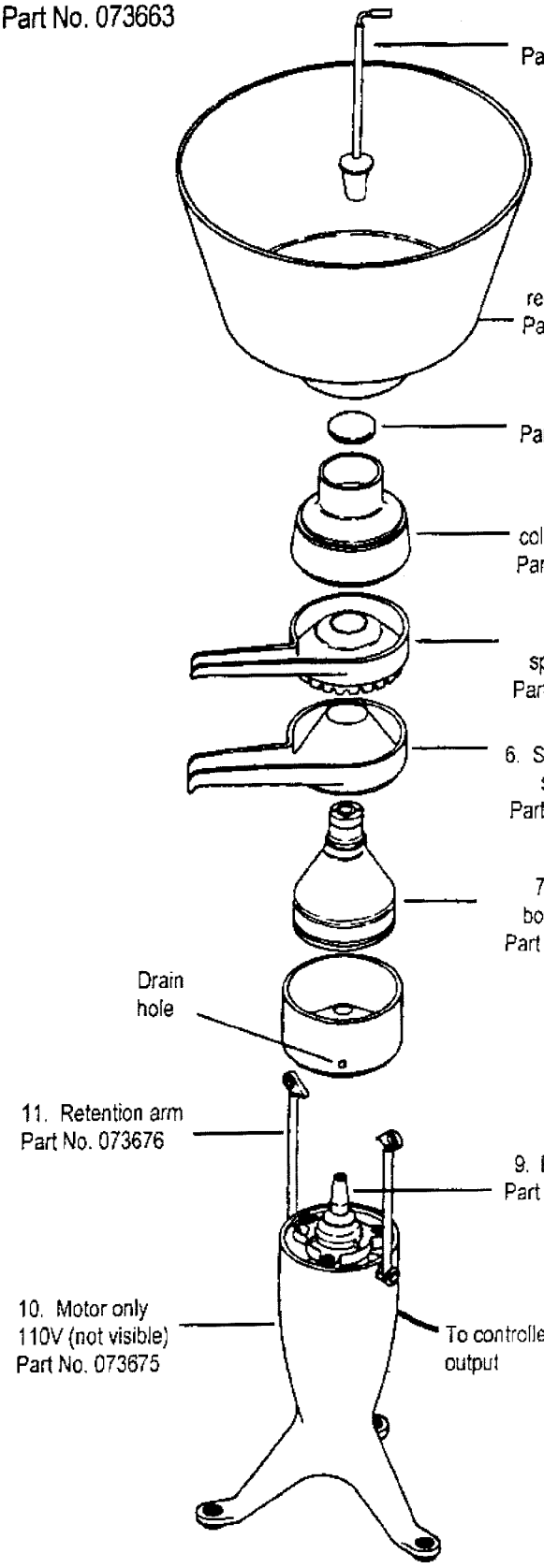
MOTOR SPARES

Carbon brush (2 per motor) 073633
Capacitor for 220V motor 073534
Rubber grommet (motor mounting) (3 per motor) 073607

Carbon brush & holder for new motor 073647

ELECREM SEPARATOR 5

With tank Part No. 073665
With bowl Part No. 073663



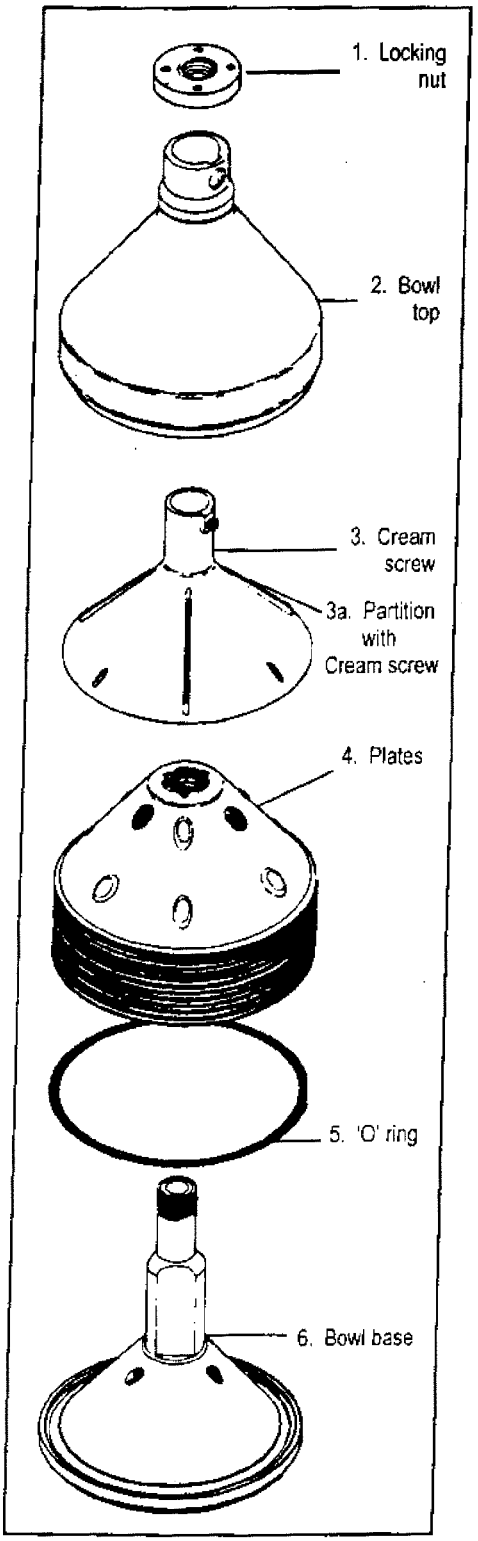
MOTOR SPARES

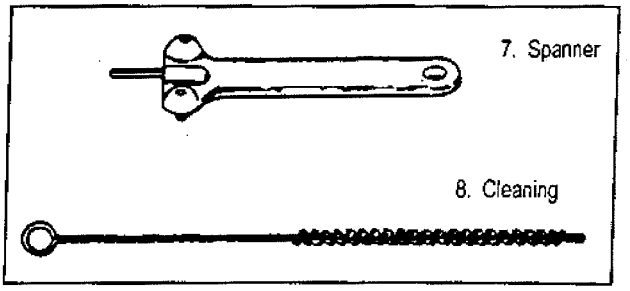
Carbon brush (2 per motor) 073633

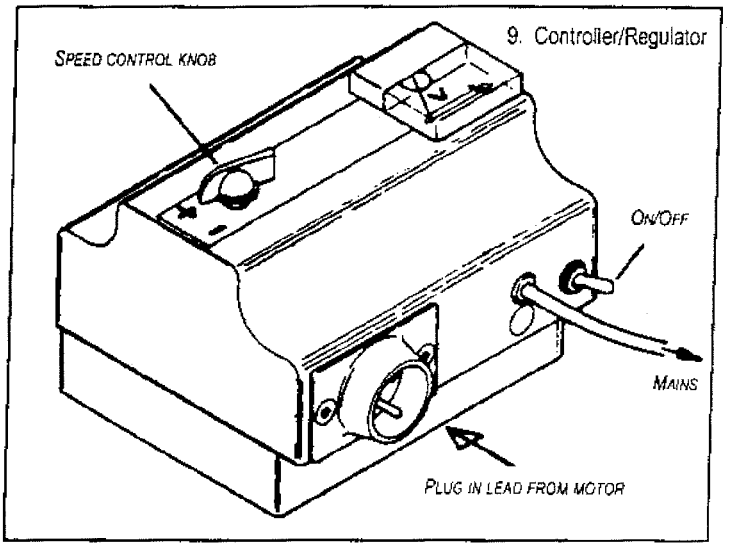
Rubber grommet (motor mounting) (3 per motor) 073684

Carbon brush & holder for new motor
073655

SEPARATOR BOWL PARTS AND OTHER ACCESSORIES FOR ELECREM CREAM SEPARATORS







ITEM NO.	MODEL 1	MODEL 2	MODEL 5
1	073525	073625	073677
2	073526	073626	
3	073523	073523	073523
3a	073527	073627	073679
4	073528	073628	073680
5	073529	073629	073681
6	073530	073630	073682
7	073516	073617	073683
8	073536	073536	073536
9	073533 (220V)	073533 (220V)	073686 (110V)