SWIRLUX 503 WASHING MACHINE

Cabinet-style domestic washing machine with 20½in. diameter vitreous-enamelled steel tub, power-operated draining pump and 11in. powered wringer. White or cream stove-enamel finished with stove enamelled aluminium tub lid. Taking up to 11lb. dry wash. Models for 200-220, 230-240 and 250V 50c/s AC. Models or other voltages and frequencies, and for DC, supplied to special order. Manufactured by The Universal Boiler and Engineering Co., Ltd., Fulledge Works, Burnley.

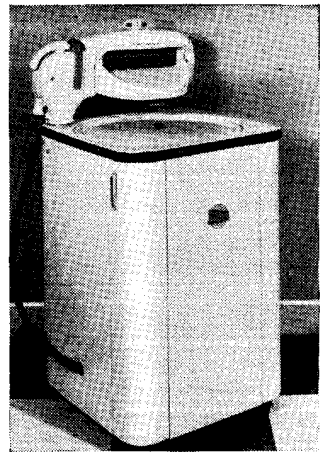

Fig. 1

THE Swirlux model 503 washing machine (Fig. 1) is a domestic cabinet type with 20½in. diameter tub and takes up to 11lb. dry wash in 12 gallons of water. Features include: a tangent-fin agitator (Fig. 2) designed to give greater water motion with less buffeting, a plug-in 11in. power-driven wringer incorporating roller pressure control and quick release safety bars, and a power-driven rotary impellor pump to empty tub.

Tub is enclosed by a circular aluminium lid fitted with central Bakelite knob. An interesting detail is that the agitator is engaged with drive shaft by pushing down a clutch control knob fitted at top of agitator. Pump is operated by pulling down, into the horizontal position, a lever located at top lefthand side of machine.

Outlet hose, attached to pump, has a hook-shape end permitting it to be hooked on side of sink when emptying tub. For stowage, and when machine is in use, hose is hooked over shoulder of wringer (Fig. 1).

The washer measures 35in. high by 23in. square. Overall height with wringer in position is 47in. Mains consumption on load, approximately 500W.

CONSTRUCTION

Cabinet is formed by curved mild-steel corner panels lapped and bolted to pressed-steel, or aluminium, side panels. Steel plates, welded across base of each corner panel and bolted to flanges of side panels, give rigidity and provide fixing for four Flexello swivel castors (Fig. 5).

Top of cabinet is fitted with a white or cream vitreous-enamelled mild-steel tub surround held by eight screws into Spire nuts clipped over slots along upper edge of panels. A die-cast light-alloy wringer support and position-locating socket is attached to a mild-steel bracket bolted across top of rear left corner (Fig. 2).

Interior and exterior of cabinet are given a rust-proof undercoat and finished in white or cream stove enamel.

The mottled grey or white vitreous-enamelled mild-steel tub is rim supported on four brackets hooked over side panels. Joint between tub and cabinet is sealed by rubber beading secured by Bostick adhesive to tub rim.

Bottom of tub is swaged for additional strength and to ensure thorough draining into outlet, which is close to die-cast aluminium agitator column in centre of tub (Figs. 2, 3).

Tub is secured by four agitator-column fixing bolts tapped into top casting of gearbox. These clamp centre of tub between an inner diecast aluminium locking ring (Fig. 3) and top of diecast aluminium drain outlet seated on base flange of agitator column (Fig. 4). Joints either side of tub, and between drain outlet and base flange on agitator column, are sealed with fibre gaskets and white lead paint.

Drain outlet (Fig. 4) is coupled by length of ribbed rubber hose to pump inlet (Fig. 5).

A high-tensile steel agitator drive shaft rotates in an Oilite bearing in top of agitator column and is fitted with a slotted milled brass drive bush to engage with drive bar of clutch control mounted inside top of agitator (Fig. 2).

The clutch consists of a diecast aluminium top cap, held to top of agitator by an Allen grub screw at the side. The cap carries a spindle fitted with a black vitreous enamelled control knob and, at the lower end, a mild-steel bar. The bar is held by a spring circlip and can revolve without turning knob.

Spring-loaded balls in the ends of the bar enter a groove to hold the bar in the raised, off, position. The bar slides in vertical grooves in the top cap. In the off position the bar is above the slotted top of the agitator drive shaft. When the knob is pushed down the bar enters the slot and couples drive shaft and agitator.

Tub is provided with a loosely-fitting perforated aluminium filter plate to prevent solids entering outlet drain.

Agitator gearbox (Figs. 4, 5) has a diecast alloy case and lid with brass insert bearings. Motor shaft is connected by flexible hose to drive shaft of a steel worm gear which drives a large worm wheel fitted with eccentric boss on which is pivoted one end of a steel rack arm. Other end of rack arm has machine-cut gear teeth which engage with pinion on agitator drive shaft. Rack and pinion are held in mesh by a phosphor-bronze slipper pivoted on pinion shaft.

Wringer drive shaft is fitted with a pinion engaging with a reduction gear formed on upper section of worm wheel. The shaft is coupled through a phosphor-bronze knuckle joint to a mild-steel drive bar projecting through wringer support and positioning socket at top of cabinet (Fig. 2).

Gearbox is filled with 2½ pints of Wakefield ST oil. Joint between case and lid, which is held by 18 hexagon bolts, is sealed by fibre gasket.

The ¼hp 1425 rpm single-phase induction motor is attached by resilient end mountings to a cradle secured by position-adjustable bolts to a cast aluminium bracket bolted to side of gearbox (Figs. 4, 5).

Gearbox and motor are supported on a chassis formed by two mild-steel cross stays bolted to semi-circular cast-alloy end brackets. These end brackets slide into, and are bolted to, semi-circular receptacles held in opposite corners of cabinet by castor fixing bolts (Fig. 4). Cross stay and receptacle fixing bolt holes are slotted to allow chassis to be correctly positioned below tub.

Continued on page 31.

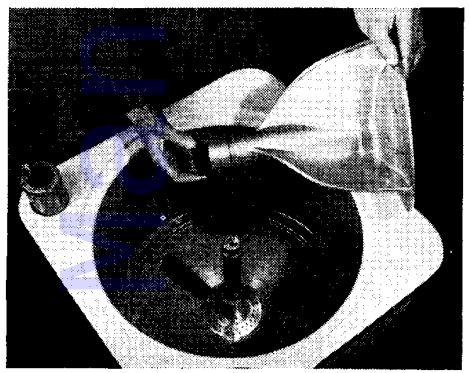

Fig. 2—The tangent-fin agitator is driven through a clutch operated by a push-knob on the top

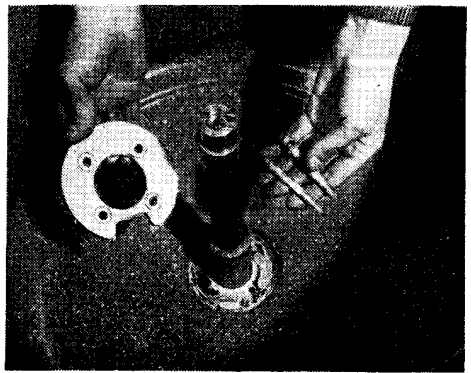

Fig. 3—Removing the tub locking ring. Note the slotted milled brass drive bush at top of agitator shaft

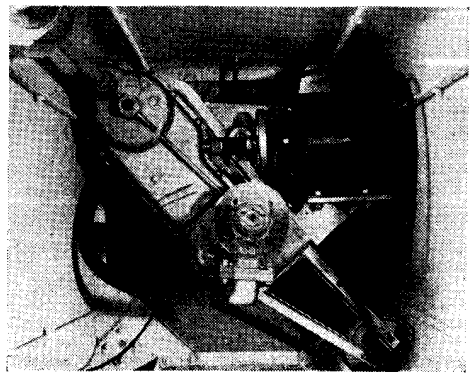

Fig. 4—Tub removed, exposing the pump, gearbox and motor. In latest models chassis suspension is modified

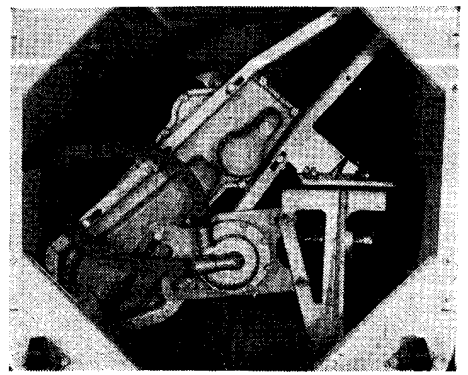

Fig. 5—From below: the pump platform is pivoted on a bracket held by two motor cradle fixing bolts

ALBA 707, 707B—*Continued*

decoupled by C16. Primary L7 C10 of IFTI is in the anode circuit.

Oscillator employs g1 g2 of V1 as a triode, connected in a tuned-grid shunt-fed circuit. Grid coils L4(MW) L6(LW) are switched by S2 to oscillator tuning capacitor VC2 and coupled by C5 to oscillator grid (g1) of V1.

T3 C4(MW) and T4 C7(LW) are trimmers and C6(MW) C8(LW) are padders. Automatic bias for g1 is developed on C5 with R2 as leak.

Anode reaction voltages, obtained inductively from L5(MW), and capacitively across padder C8(LW), are switched by S3 to oscillator anode (g2) of V1 of which R3 is the load.

IF amplifier operates at 470kc/s. Secondary L8 C11 of IFT1 feeds signal and AVC voltages, decoupled by R7 C9, to grid of IF amplifier V2. Screen voltage is obtained, in common with g4 of V1, from R4, decoupling being by C16. Suppressor is internally strapped to negative side of filament. Primary L9 C12 of IFT2 is in the anode circuit.

Signal rectifier. Secondary L10 C13 of IFT2 feeds signal to diode anode of V3. R10 the volume control is the load and R5 C14 C15 an IF filter.

Pickup. Signal from magnetic pickup is applied across R9 and in Gram position of S4, which is ganged to wavechange switches S1 to S3, is fed to volume control R10. To prevent radio breakthrough on record reproduction, g3 of V1 is 'earthed' to AVC line, and oscillator grid (g1) and anode (g2) are disconnected from their tuned circuits.

AVC. The DC component of the rectified signal across R10 is decoupled by R6 C5 and applied through L2 L3 to g3 of V1, and further decoupled by R7 C9 and fed to g1 of V2.

R8, with R7 R6 and volume control R10, form a potential divider across the 7.5V DC filament supply. Diode anode V3 and control grids V1, V2 are thus fed with a positive voltage from the potential divider which is approximately equal to voltage between their filaments and chassis. The two voltages in effect balance each other out and provide zero bias conditions.

AF amplifier. C17 feeds signal from volume control R10 to grid of pentode AF amplifier section of V3. Automatic bias for grid is developed on C17 with R11 as leak. Screen voltage is obtained from R16 decoupled by C18. Suppressor is internally connected to negative side of filament. R17 is anode load.

Output stage. C19 feeds signal at anode V3 through stopper R15 to grid of pentode output amplifier V4. Normally grid is biased negatively by virtue of its filament being at high potential side of LT supply. On battery operation, however, anode current of V4 is reduced, to prolong life of battery, by increasing negative bias on grid by returning its grid resistor R12 to chassis through R13 in negative HT battery lead.

Screen voltage is obtained direct from HT line, decoupling being by C20. Suppressor is internally connected to centre tap of filament.

Audio output at anode V4 is transformer fed by OP1 to a 5in. PM speaker L13. C22 provides tone correction.

HT of 90V is provided by an Ever Ready Batrymax B107 or alternatively from the mains. Receiver HT line is switched by S5 to which ever supply is desired. HT line is RF decoupled by C1. C20 decouples HT battery and functions as smoothing capacitor on mains-generated HT.

When operated from AC mains, HT is provided by series-connected rectifiers MR1 MR2 which are fed direct from input mains. HT is resistance-capacity smoothed by R18 C23 and C20. Tappings on R18 are provided to allow rectified output to be adjusted to give approximately 90V with mains input of between 200 and 250V.

Model 707B, which is suitable for 100-120, 200-250V AC/DC mains, is fitted with a different value dropper R18 and in addition has a smoothing choke in series with HT feed to S5 and receiver.

To compensate for lower resistance of MR1 MR2 when used on DC inputs, reservoir smoothing capacitor C23 is connected to 200V tapping on R18. C23 should be rated to handle 150mA ripple current.

LT of 7.5V for the series-connected filaments of V1 to V4 is provided by an Ever Ready All-dry 31 battery or, if the receiver is operated from the mains, from the rectified and smoothed HT through potential divider R19 R20. Receiver LT positive line is switched by S6 to appropriate source of supply.

R14 decoupled by C21 and R1 decoupled by C3 are current by-pass resistors to maintain correct voltage across each valve filament. S7 which is ganged to S5 S6 is mains on/off switch. whilst on battery operation HT and LT circuits are switched off by S5 S6 respectively.

Chassis removal. Unscrew gram motor winding handle from side of case and insert coin in slots of the two quick-release screws and twist through 90 degrees. Place fingers under left hand side of turntable and lift up and withdraw motorboard. Pickup connecting leads are long enough to allow motorboard to be placed on bench. Next remove pickup and LT battery lead cleat fixing screw.

Receiver panel with chassis attached can be tilted in three directions sufficiently to carry out voltage checks and valve replacement. For major repairs chassis can be completely removed from case after frame aerial leads are unsoldered from tags (under cover plate) on inside of lid and mains leads from input socket.

TRIMMING INSTRUCTIONS

Apply signal as stated below	Tune Receiver to	Trim in Order stated for Max. Output
(1) 470 kc/s to g3 of V1 via .01 mF	—	Cores L10, L9, L8, L7
(2) 600 kc/s to frame aerial via Loop,	500 metres	Cores L4, L2
(3) 1.5 mc/s as above	200 metres	T3, T1
(4) 154 kc/s as above ...	1950 metres	Cores L6, L3
(5) 300 kc/s as above ...	1000 metres	T4, T2

SWIRLUX 503 WASHING MACHINE

Continued from page 26

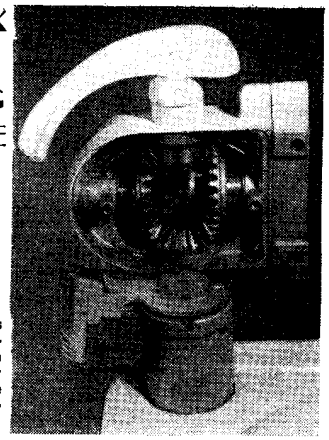

Fig. 6—Wringer is fitted with a Swirlux gearbox seen here with outer casing and one coverplate removed

Latest releases of this machine have a slightly different method of chassis fixing. In these models, the semi-circular receptacles are dispensed with and the end brackets of chassis are bolted to mild steel support brackets fitted with rubber buffer feet resting on cabinet corner brackets. As before the fixing bolt holes are slotted to allow adjustment.

Pump unit (Fig.5) consists of a diecast light-alloy housing fitted with inlet and outlet pipes and containing a rotary impellor, the shaft of which is fitted with a rubber tyred drive wheel. Pump is mounted on a mild-steel platform pivoted on a bracket held in place by the two lower motor cradle fixing bolts. Platform is spring retained in its OFF position and coupled by Bowden cable to pump control lever positioned at top left hand side of cabinet.

When control lever is lowered into its ON position the pump platform is pulled over to make rubber-tyred drive wheel engage with outer face of pulley fixed to motor shaft. Inlet of pump is coupled by ribbed rubber hose to tub drain outlet. Pump outlet is fitted with 6ft. of hose with moulded hook-shape end.

Three-core rubber-covered mains cable is fed through rubber-bushed brass grommet at bottom of rear panel and connected to motor terminal box. On/off switch, mounted in a recessed and shrouded die-cast aluminium housing screwed to top right-hand side panel, is coupled by twin rubber-covered cable to motor terminal box.

Wringer is a standard Acme model, with 11in. rubber rollers, and is fitted with a special Swirlux gearbox (Fig.6).

Drive shaft in support column has a square centre hole into which fits square top of wringer drive bar projecting up through socket on washer cabinet (Fig.2). Wringer gearbox housing incorporates a pivoted and spring loaded position-locating lever which fits into any one of the five locating slots around socket flange (Fig.6), thus allowing wringer to be locked in any of these positions.

Wringer gearbox follows standard practice in that drive to roller is transmitted, by sliding dog-clutch operated by top control lever, from either of two bevel gears driven by pinion attached to centre drive shaft.

Gearbox is grease filled and enclosed by press-in cover plates held securely in position by fixing screws of cast aluminium outer housing.

MAINTENANCE

Lubrication. Since gearbox is oil filled and motor has oil reservoirs, these components should not require attention throughout normal life of machine. If, however, washer is used every day, as in boarding houses or hotels, the motor oil-pad reservoirs should be replenished every 2,000 hours with Shell Vitre 27 oil. To do this it is necessary to remove tub as described below to give access to motor.

Oiling is carried out by removing grub screw in periphery at each end of motor and slowly filling with oil until it seeps out through overflow holes on end faces.

Should replacement of any part become necessary it can be removed for return to the manufacturers by the procedure outlined below.

Removal of tub. First remove wringer, tub lid, agitator and filter plate. Undo and remove the eight surround fixing screws and lift off surround. Finally undo and remove the four hexagon-headed bolts in bottom of tub and carefully loosen and ease up clamp plate and sealing gasket and withdraw them from agitator column. Tub can be lifted out. With tub removed, access is available to motor and wringer drive bar and socket, etc. (Fig.4).

Removal of motor. Undo nuts and remove bolts and half clips securing flexible hose coupling to motor shaft and gearbox drive spindle. Remove clip-on cover over switch and disconnect cable leads from switch terminals. Also undo and remove nut and bolt securing cable positioning cleat to chassis and slacken off nut on cable entry bush at bottom of rear panel of cabinet.

Finally, loosen fully the screw securing each motor end clamp—slip off clamps and withdraw motor with mains and switch cable attached.

Removal of pump unit. Lay machine on its back and uncouple hose from pump inlets and outlets by loosening screws in Terry hose clips. Undo and remove hexagon-headed bolt to which tension spring is anchored on pump platform—this also allows Bowden cable to be withdrawn from its hole in hexagon post.

Remove nut and lock nuts on the bottom left and upper right guide bolts and finally undo and remove nut and lock nuts on pivot bolt at bottom righthand side of platform. Pump on its platform can now be withdrawn.

Removal of gearbox and chassis. With machine upright remove circlip around bottom knuckle joint on wringer drive bar and push out connecting pin and withdraw drive bar. Lift drain outlet assembly from agitator column. Lay machine on its back, remove Bowden cable from guide and stop post on underside of upper chassis stay. Remove the two hexagon bolts clamping chassis end brackets to semi-circular receptacles in bottom left and top right corners of cabinet.

Place machine upright. Gearbox and chassis can now be withdrawn through top of cabinet. If gearbox oil is to be replenished the gearbox must be unbolted from chassis to give access to gearbox lid bolts.

Special Note. On the latest models with modified chassis fixing as described above it is possible to expose the whole of the internal assembly with tub attached to gearbox.

To do this, remove surround and disconnect mains lead to switch and loosen cable entry bush locking nut at bottom of rear panel. Invert machine on suitably protected surface and uncouple Bowden cable from pump platform and chassis. Cabinet can then be lifted off.