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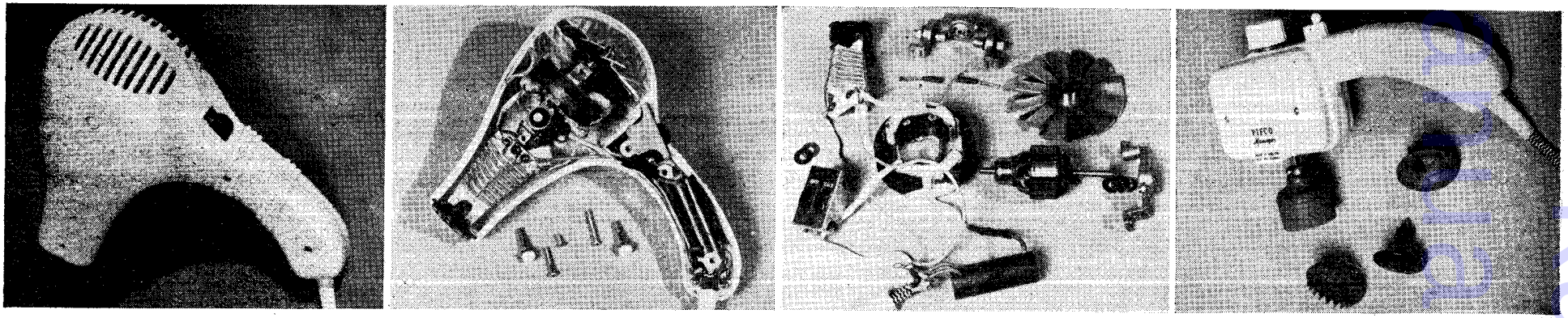
SERVICE ELECTRICAL and RADIO TRADING CHARTS



These three pictures show the assembled hairdryer, the machine with half the moulded case removed, and the parts when fully dismantled

PIFCO HAIRDRYER

Streamlined hand-type hairdryer in ivory finished moulded case fitted with thumb-operated ON/OFF and heat switches. Models for 100–120, 200–250V AC/DC supplies. Manufactured by Pifco Ltd., Pifco House, Watling Street, Manchester 4

THE body of the hairdryer (Figs. 1 and 2) is of modern streamline design and is formed by two moulded ivory plastic half-sections. One of these sections is used to secure in position the motor, motor ON/OFF and heat switches, radio interference suppression capacitor, and to anchor the mains input lead (Fig. 2). The other section functions as a cover with three of its fixing screws serving to give additional support to the assembly.

The rear portion of the body, in which is housed the motor and the heater unit, is provided with a large air intake grille. A black moulded outlet grille is fitted at its nozzle.

The 500W spiral-type heater element is supported on a fireclay former held in position at the front by phosphor bronze clips attached to back of outlet grille and, at the rear, by a bolt fitted with spacer tapped into a stud provided in body moulding.

The series-wound universal type motor (Figs. 2, 3) is fitted with self-aligning and self-lubricating bearings and has an armature speed of approximately 7,500rpm. The motor is supplied wound for either 100–120 or 200–250V AC/DC.

Front end of motor rests on same body stud as rear of heater and is held by a screw inserted from outside of body through clearance hole in stud and tapped into motor frame. Rear of motor is held in a similar manner with the exception that instead of the frame resting on a moulded stud on body it is positioned on a rubber cushioned metal spacer placed over the fixing screw.

A 12 blade metal fan is attached by collar and grub screw to armature spindle at rear. Fan is positioned immediately behind intake grille and the air drawn in is directed around motor for cooling before passing through heater spiral and out through grille at front of body.

Heater former is conically shaped to reduce heating area towards outlet grille thus preventing over-heating at that end.

Motor and heater ON/OFF switches and radio interference suppression capacitor are in handle section of body (Fig. 2). Switches are of the sliding type positioned side by side toward top of rear of handle and are conveniently manipulated by thumb of hand grasping the appliance. Switches are connected in series thus preventing heater being switched on without motor running.

Radio interference suppression capacitor is a triple type in which .1mF is connected directly across input mains and .005mF between each side of mains input and frame of motor.

The hairdryer is provided with 6 feet of braided cotton-covered rubber-insulated twin flex terminated with a standard bayonet plug. Flex is fed into base of handle through a moulded plastic protector and is secured under a fibre cord grip clamped in position by connecting tag fixing screws.

Cover is attached to body section directly by the two handle screws which are tapped into brass inserts in body studs. The three screws in line along side of top portion secure cover to moulded

Continued overleaf.

and Vibratory MASSAGER

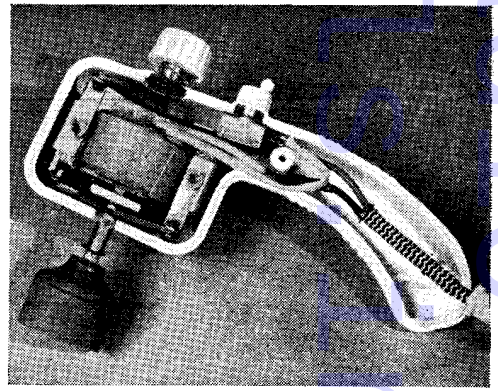
Vibratory massager with variable speed regulator. Housed in moulded ivory plastic case with thumb operated ON/OFF switch. Supplied with four attachments. Models for 100–120 or 200–250V 50–60c/s AC only. Manufactured by Pifco Ltd., Pifco House, Watling Street, Manchester 4

THE Massager (Fig. 1) is designed for applying vibratory massage to parts of the body to improve blood circulation and generally stimulate the system. Amongst its many applications it can be used on the scalp to remove dandruff and promote healthy growth of hair, on the face to remove wrinkles, etc., and on the body to relieve stiff joints and muscles.

Operation relies on the use of an AC-mains energised solenoid in the field of which is placed a soft iron armature to which are attached the applicators. The frequency of vibration is derived from that of the mains supply used and the solenoid is designed to operate with optimum efficiency at between 50 and 60c/s.

The " speed control " is coupled to an adjustable damping system and regulates the amplitude of movement of the armature.

The Massager is supplied with four applicators or attachments to fit on end of armature. The sponge rubber is for gentle massage and face treatment, the flat rubber for treatment of bust, neck and eyes, the spiked rubber for scalp massage and hard applicator for use on body and muscles.



Two pictures above show the vibratory massager with its accessories and with half its moulded case removed

CONSTRUCTION

The solenoid consists of pack wound, enamel-covered wire coil on an impregnated cardboard bobbin fitted with a laminated soft iron core built of E-shaped stampings. Centre of core is provided with an air gap of approximately $\frac{1}{4}$ in. square into which fits a square soft iron armature. The armature is fitted with a flat soft iron cross bar which extends across face of coil and over side pole faces formed by ends of E shaped stampings.

The armature is attached at each end to laminated spring supports which are screwed to corner brackets held in place by core lamination clamp nuts. A hexagonal and internally-threaded con-

Continued overleaf.

PIFCO HAIRDRYER—*Contd.*

outlet grille and to motor frame. Heads of two screws which secure motor to body and two screws which attach cover to motor are deeply recessed and provided with ivory plastic screw-on safety covers.

DISMANTLING AND MAINTENANCE

Renewal of heater.—Lay hairdryer on bench with its nozzle pointing to the left. First carefully unscrew and remove the two small ornamental plastic safety covers positioned one on either side of words "Hair Dryer" embossed on cover. If difficulty is experienced in withdrawing these it may be due to use of "over-size" or misshaped covers in which case they will have to be carefully prised out with a thin bladed knife or similar tool but, before attempting this, it is essential to make sure that they are fully unscrewed from head of screw below.

With special screwdriver undo and remove the two screws exposed and also undo and remove the remaining three countersunk screws positioned one at nozzle and two along side of handle.

Carefully separate and lift off cover from body. Unsolder connecting leads from heater tags. Remove screw and spacer securing inner end of heater former to body and also screw, located on other side of body, holding outlet grille. Heater assembly is now free.

Loosen terminal bolts and remove old spiral. Replace with new spiral of correct type and re-assemble in reverse order.

Replacement of motor brushes. These should be renewed if worn down to less than ¼ in. Remove cover as described above and in addition remove safety covers and motor-fixing bolts on outside of body. Raise up and rotate motor to give access to both brush holders. Remove press-on caps on top of brass brush holders and withdraw brushes complete with springs. At this point commutator should be examined and if necessary cleaned with carbon tetrachloride and then polished with dry cloth.

Insert new brushes in holders, replace caps and reassemble in reverse order.

Oiling of motor bearings.—These are Oilite type and require attention only at long intervals and can conveniently be attended to when renewing brushes. To do this it is necessary to dismantle the motor completely as follows :—

With cover off and motor-fixing bolts and brushes removed as described above, unsolder motor leads from heater tag and from centre switch contact, and also undo nut securing lead from interference suppression capacitor to frame of motor. Motor is now free to be withdrawn from body. Remove fan by undoing grub screw in collar and unscrew and remove the two screws which clamp together end frames and field coil assembly.

Carefully withdraw armature from bearings, noting the sequence of the spindle washers for correct reassembly later. If packing washers are fitted, make sure the fibre washers are placed on armature shaft before steel washers. Undo the two screws holding bearing plates to each end frame. Remove bearings with felt washers and immerse them in light machine oil. When re-assembling motor the bearings should realign themselves automatically but if not a sharp light tap with wooden mallet on edge of laminations will release any tension on the frame.

Finally, when replacing fan, fit washers on armature shaft in the following order: fibre washer, steel washer, then the spring, followed by steel washer and finally fibre washer. Slide fan on shaft with locking screw away from motor. Then, with slight pressure on fan putting tension on spring, tighten the fan locking screw, then re-assemble.

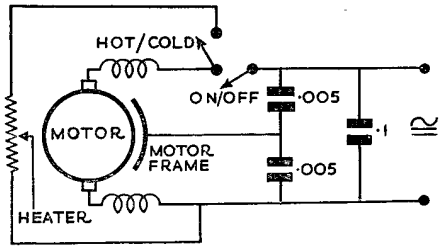
VIBRATORY MASSAGER

Continued

nector, into which screw the applicators, is screwed on to one end of armature and held securely in position by two grub screws.

When mounted in the body the other end of armature bears up against a strong compression spring which forms part of the "speed control."

The speed control consists of a hollow brass bush with internal thread into which screws the hollow spindle attached to the ivory moulded knob. The



The heater cannot be energised unless the motor is already switched on

brass bush is provided with an external flange which retains it in position in the casing. The spiral compression spring is inserted inside hollow bush and, when whole assembly is in position, bears against top end of vibrator armature. Rotation of knob in a clockwise direction increases thrust of spring against the armature.

Solenoid, speed regulator and ON/OFF switch are mounted in an ivory moulded body formed in two half-sections clamped together by solenoid-fixing bolts and two screws in handle.

Six feet of braided cotton-covered twin-rubber flex is fed through a moulded protector into base of handle where it is secured under fibre cord grip. Mains lead is terminated with a standard bayonet plug.

In view of the simplicity and robustness of the mechanism it is considered unnecessary to give any service instructions.

REPLACING IRON ELEMENTS

IN a review of an iron we said, when dealing with fitting a replacement element, "use a new asbestos pad unless the old one is complete and intact." This has brought us the comment from a retailer, that a new asbestos pad should *always* be fitted when replacing an element.

An old pad, being dried out, and bearing an impression that will not coincide exactly with the new element, will probably fail to press the new element firmly on the sole plate at all points. Hot spots and shortened life will result.

On checking with a manufacturer's technical department we found that it had never been thought necessary to recommend retailers to order a pad with each element but that the practice was a good one.

MY IDEAL SERVICE BENCH

Layout and equipment of the bench have great influence on an engineer's capacity for work and total output. Have you given the design of your bench the consideration it warrants?

AS a basis for comment, I should like to outline my idea of an ideal service bench.

First, physical considerations. Height is not unduly critical, but I believe that a recent efficiency test showed that, in most cases, when seated at a bench, an operator's elbows should be about half an inch above bench top. Depth can be anything from about 22 to 33in. depending on circumstances; the length can be almost anything in excess of about 3ft. 6in.

Power supply arrangements should be plentiful. Points should all be flush-fitting, switched, and arranged each side of the engineer's position so that all are within comfortable reach.

A DPDT switch in series with all the outlets should be so arranged that it is possible to ensure that when servicing AC/DC radio and television receivers, the chassis is always connected to the earthed side of the mains supply. A miniature neon with one side wired to earth, and with the other side wired to a heavily insulated flexible lead would enable this condition to be checked.

The electric soldering iron would have a tapped .3A dropper in series with it, but shunted by an ON/OFF switch so that when the iron was wanted for long periods, it would be possible to maintain the temperature within reasonable limits.

A good loudspeaker would be fitted to the bench and made switchable to suit high- or low-impedance receivers. Aerial and earth leads would be duplicated and available at each end of the bench.

A car type flexible inspection lamp, comprising a standard 6V MES bulb in a transparent plastic holder at the end of a 2½ yard rubber covered cable would be fed from a bell transformer for illuminating awkward corners.

There should be no "back" to the bench top as a back makes the handling of large cabinets difficult and reduces natural illumination. The top of the bench should slope off at the far side to accommodate power outlets and the speaker switch.

Bench drawers must be shallow (deep ones are worse than useless) and should be well divided into small compartments with "a place for everything."

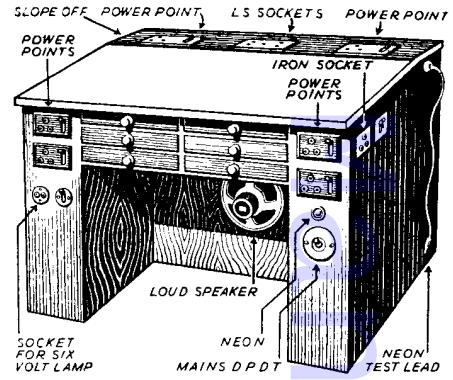
All receivers should be cleaned before they reach the bench and signal generators, etc., should only be brought to the bench as required.

I would like a sort of Anglepoise fitting to hold the multi-range meter at the most convenient position for each job; failing that, a shelf a little below eye-level but well back, is a good place for this instrument.

If many battery receivers are handled, a built-in eliminator would be useful, fitted with insulated croc-clips on the end of flexible leads; I find this handier than plugging the receiver leads directly into the eliminator, since this so often makes it difficult to turn the chassis upside down.

There, in brief, are my ideas, but doubtless other engineers can offer improvements?—G. R. WILDING, Liverpool.

We think a simpler method of ensuring the earthing of AC/DC chassis is desirable and that



the "slope-off" bench back has more snags than merits.

Would Mr. Wilding's bench be better for a steel block as iron rest, a 6 and 12V DC supply for car radios, some non-standard sockets wired in parallel, a well in bench top (with removable tray) for tools, a shelf below the bench for cabinets or instruments?

These are some of our ideas "triggered" by Mr. Wilding's contribution. Let us have yours. —TECHNICAL EDITOR.

PHILCO 581

ALL right on gram; no radio on long or short waves. Valves were OK and, with signal generator, set was found to be alive from FC, anode but not from FC grid.

The anode voltages were correct on gram; when switched to radio, the oscillator anode and SG of FC valve dropped from 120 to 15V. The grid of oscillator also had a positive voltage of 14V.

The condenser between oscillator anode and grid was found to have a resistance of only 1,000 ohms when fixed to wave-change switch but was OK disconnected from switch. The two points on switch where anode and grid were connected had a leakage of 1,000 ohms.

Oscillator grid lead and one end of condenser were disconnected from switch and cure completed. —W. LEAVER, Bishop Auckland.

COSSOR BATTERY RECEIVER

A COSSOR battery set was giving intermittent signals accompanied by a varying degree of distortion.

A milliammeter in the HT lead showed an increase of 2-3mA when signals faded and distortion increased, and the cause was traced to the output stage.

A slight positive voltage on the grid brought the AF coupling condenser under suspicion. This was removed and tested, and although there seemed no leakage, was replaced. The positive voltage however, was still present.

The valve was removed in case of an internal fault and then leads were disconnected until it was found the positive voltage was present only when the HT to the screen grid was connected.

The fault was in the socket and replacement provided a complete cure. The faulty holder showed an intermittent leakage of 40-50 megohms. —J. C. H.