Chapter 1

INFLATABLE EXPOSURE SUITS

Mk. 1 assembly (*Stores Ref.* 22C/1129)
Mk. 2 assembly (*Stores Ref.* 22C/1543)

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Introduction

1. Inflatable exposure suits are provided for the use of flying personnel to protect them from the effects of exposure in very cold climates. They are waterproof and windproof, are donned in the dinghy after ditching or abandoning an aircraft in flight over the sea, and when inflated they provide a blanket of warm air round the body which acts as an insulator.

2. When inflated, these suits expand inwards as well as outwards and in so doing seal the opening round the neck and face sufficiently to prevent serious loss of body heat. The suits are worn over all items of clothing, except boots or shoes and helmets, and no attempt should be made to remove any other items even though they are wet.

Mk. 1 ASSEMBLY

3. This assembly is illustrated in fig. 1, 2 and 3 and the packing and donning of the suit are illustrated in fig. 4 to 19. The assembly consists of the following items :—

(1) The suit (*Stores Ref.* 22C/1127) which protects the wearer from the effects of exposure.

(2) The cushion (*Stores Ref.* 22C/1128) which provides a comfortable seat in the dinghy and insulation for the buttocks.

(3) The pack in which the suit and cushion are stowed. This pack bears the Stores Reference of the complete assembly on the outside, but is provided as a spare (*Stores Ref.* 22C/1384) for use when repacking the suit and cushion for use, vide para. 32.

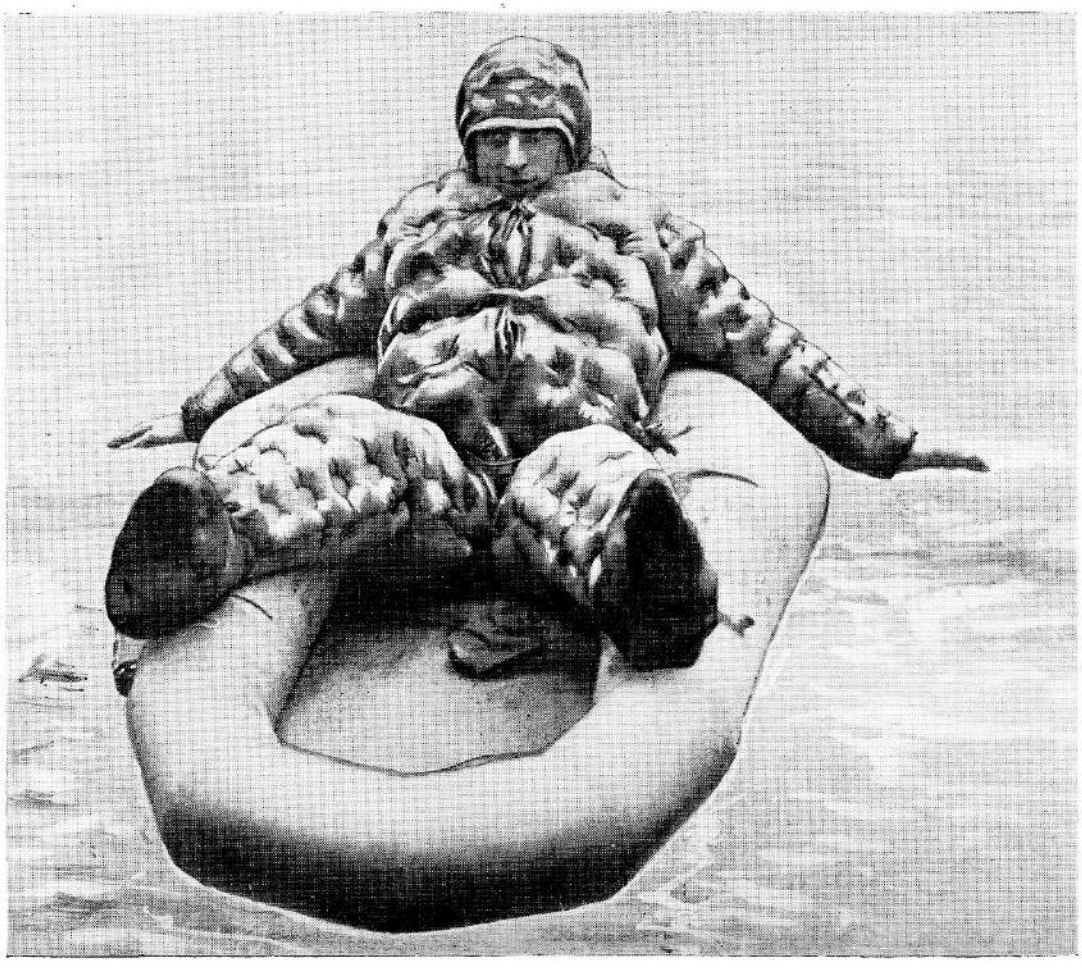


Fig. 1. Mk. 1 suit fully inflated

Description

Suit

4. The suit (*fig.* 2) is made from two layers of single-ply rubber-proofed fabric dyed yellow, which are joined together by anchorage patches and seams to form a garment that covers the whole body; the face and hands are left bare. The only parts of the suit which cannot be inflated are the seat portion and the soles of the feet.

5. Anchorage patches are made by smearing the proofed surfaces of both layers of fabric with self-vulcanising solution in the form of discs at regular intervals all over the suit; these are then stuck together to produce the quilted pattern seen when the suit is inflated (*fig.* 1). The edges of the two layers of fabric of the various parts are then smeared with self-vulcanising solution to a width of $\frac{3}{4}$ in. and stuck together; this seals each part separately, e.g., the arms are separate from the body at this stage.

6. The various parts are assembled and joined by lap seams, $\frac{1}{2}$ in. wide, unless otherwise stated, the seams being stuck together with self-vulcanising solution. It should be noted that sewing is not used in any of the seams which join the various parts together.

Fig. 2. Suit, cushion and pack

6. To provide inter-communication between each part so that inflation can be obtained through a single inflation tube, holes are punched in the inner layer of fabric and are positioned so that they are adjacent on assembly. These holes are covered by patches of rubber proofed fabric so that the suit is again sealed against leakage, but air is allowed to pass from one part to another through the holes until full inflation is obtained. A typical arrangement of this feature can be seen by holding the tringular patch between the neck and the back of the suit

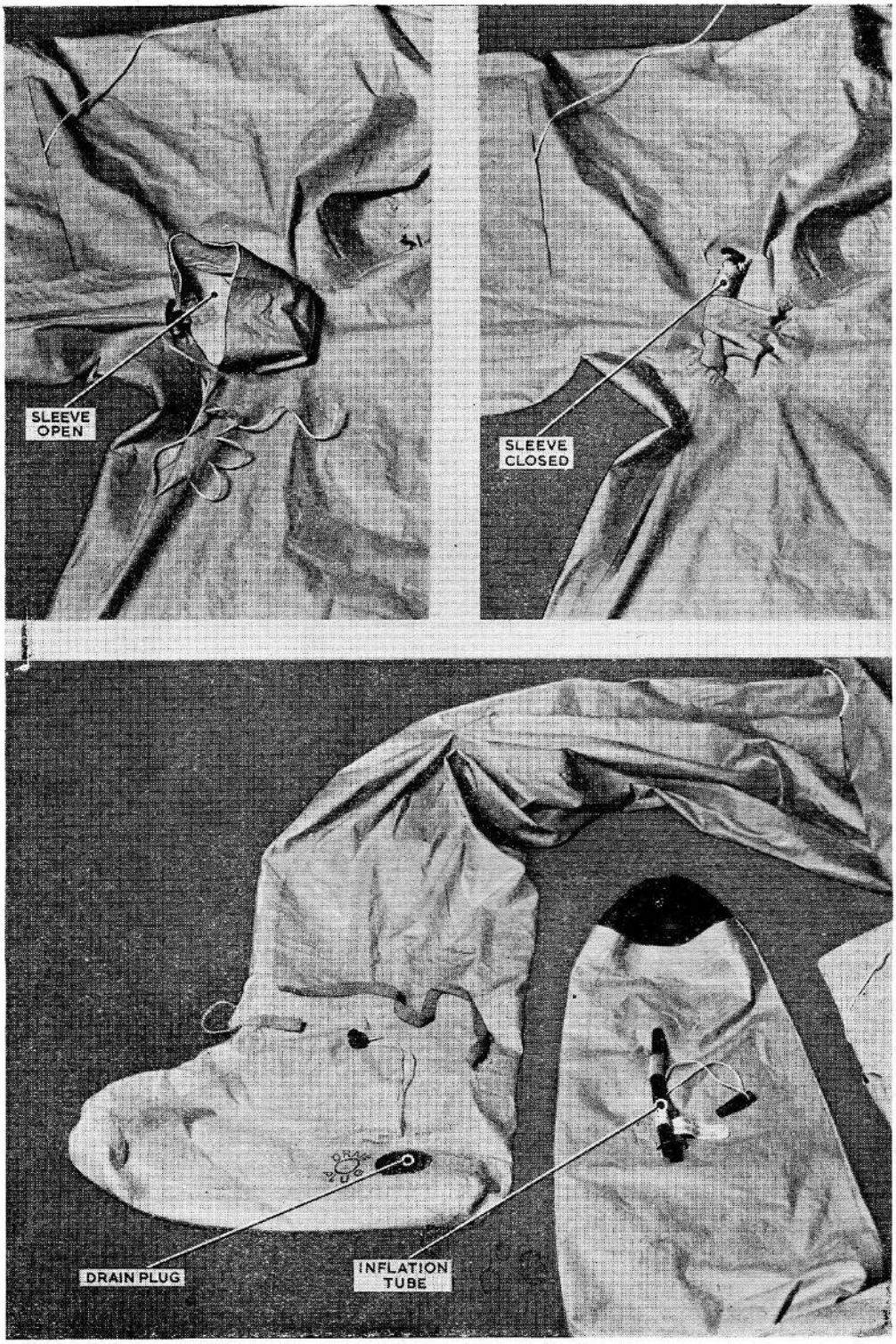


Fig. 3. Crotch assembly, draining and inflation points

up to the light; three holes will be seen under the patch, one in the neck and one on either side of the main seam down the back.

7. The junction of seams at the crotch is reinforced by two patches, one on the inside and one on the outside of the suit. This prevents the seams lifting at this point, and also provides additional strength to withstand the pulling and stretching of the front opening and gusset when the suit is being donned.

8. In front the suit has an opening similar to that of a suit of combination overalls, and on the inside of this opening is a gusset which extends upwards from the crotch to a point inside the front of the helmet 8 in. above the neck line. The edges at each side of the opening are sealed as described in para. 4, and the inside of these edges and the sides of the gusset are then smeared for a depth of 1 in. with self-vulcanising solution, and stuck together. The inside edges of the front of the helmet are also secured to the gusset in a similar manner. At the top of the gusset are two hinged fabric stays, one on either side of the front of the helmet, which reinforce the joints at these points. The gusset is V-shaped, and is a single piece of single-ply rubber proofed fabric, the point at which it is joined to the bottom of the front opening of the suit is reinforced by two patches, one on the inside and one on the outside of the suit.

9. Fourteen holes are punched along the top edge of the gusset, each hole being reinforced by a circular patch. One end of a draw cord is threaded through alternate holes from left to right, and is brought back from right to left through the remaining alternate holes. The two ends of this cord are secured to the left-hand side of the gusset with self-vulcanising solution, and covered with a patch.

10. Four pairs of light webbing tapes are provided for fastening the front opening of the suit and the front of the helmet. Each tape is sewn to a proofed fabric patch stuck to the suit with self-vulcanising solution, and the tapes are at regular intervals along the line of the front opening and helmet (*fig.* 2).

11. The sleeve cuffs are made from moulded rubber and fit tightly round the wrists to prevent ingress of water. The cuff and sleeve are joined by a 1 in. lap seam, and the outside of this seam is covered by a piece of 1 in. proofed rubber tape (*fig.* 3).

12. A patch pocket is provided on the upper part of each leg, and there is a small pocket on the top right-hand side of the gusset. Drain holes are punched along the bottom edge of the pocket on each leg, and the pocket on the right leg is the position where a cord from the cushion is secured to the suit. The pocket on the gusset is used as a stowage for the looped ends of the draw cord after they have been pulled up and tied.

13. To enable the wearer to urinate a sleeve, $4\frac{1}{2}$ in. long by 10 in. circumference, is fitted just above the crotch (*fig.* 3). A moulded rubber key is secured to the outside of the top of the sleeve, and when the sleeve is closed it is wrapped round the key and held there by a cord bound round the rolled sleeve and fastened to the top of the key (*fig.* 3). The base of the sleeve covers a hole in the suit, the join being reinforced by a piece of 1 in. proofed tape.

14. The suit is inflated through a small rubber tube on the left sleeve near the wrist (*fig.* 3). The free end of this tube is retained close to the sleeve by a loop of $1\frac{1}{4}$ in. proofed tape, and a rubber stopper is provided to close the end after inflation. Attached to the tube is a piece of cotton tape bearing the following information "WET PLUG BEFORE INSERTING," as a reminder of a simple method of inserting the stopper, or plug, into the tube to form an airtight joint.

15. Two drain holes are provided, one on the inside of each foot (*fig.* 3). They are constructed in moulded rubber, and are normally sealed by a plug which should only be removed when it is necessary to drain moisture from the bottom of the suit. The following information is stencilled above each drain hole "SEE PLUG RESEATED AFTER DRAINING."

16. On the outside of each leg adjacent to the pocket is a rip-strip. These are pro-

vided as a means of emptying the suit quickly if it should become waterlogged, and are, therefore, only used in an emergency. Each rip-strip covers a slit 9½ in. long which provides the outlet; the rip-strip is a piece of fabric covering this slit which is cut by a cord laid along the line of the slit under the fabric. This cord is anchored to the top reinforcing patch of the slit, and the free end terminates in a fabric tag on the outside of the rip-strip. It should be noted that these rip-strips are made from fabric which is not bias cut, so that the cord can make a clean cut along the line of the slit when the tag is pulled.

17. The feet of the suit have soles made from a double thickness of proofed fabric, and the upper, or top portion, of each foot is inflatable. The sole and upper are joined by a ¼ in. lap seam which is covered on the outside by 1 in. proofed fabric tape. Just above the heel of each foot is a length of light webbing tape used to tie this part of the suit round the ankle, the tape is sewn to a proofed fabric patch which is stuck to the outside of the suit.

18. The helmet is constructed on the same principle as the remainder of the suit, and is joined to the body by a lap seam. Two pieces of light webbing tape, one on each side just below the top of the gusset, are provided to fasten the front round the face. Once inflated the helmet fits snugly over the head and cheeks leaving only the front of the face exposed.

Cushion

19. The cushion (*fig.* 2) is made from two pieces of undyed single-ply proofed fabric, and provides a comfortable seat and an insulation against cold. It is 16 in. by 14 in. deflated, has an inflation tube at one corner, and is secured to the suit by a length of cord between the pocket attachment on the right leg and the corner of the cushion opposite the inflation tube. When inflated, the cushion forms three tubular sections joined on their long sides.

Pack

20. The pack (*fig.* 2) is made from a single piece of single-ply fabric identical with that used for the suit. It measures approximately 15 in. by 10 in. by 1¼ in. internally, and is constructed to form a rectangular bag in which the suit and cushion are stowed after folding. Air trapped in the pack is expelled through holes punched along the edges of the flat surface, thus removing the danger of the expansion of air trapped in a closed space at high altitudes. The mouth of the pack is sealed after the suit and cushion have been stowed, and a rip-strip is provided on one of the flat surfaces, the tag of which is pulled to expose a slit in the pack through which the equipment inside is withdrawn for use in an emergency, or for servicing.

MK. i

Folding and packing the suit and cushion

21. Lay the suit and cushion on a flat smooth surface, a parachute packing table is ideal for this purpose. Thoroughly deflate the suit and spread it out flat, front uppermost, ready for folding; it is recommended that Units carrying out packing provide a suitable adapter for connecting the inflation tube to a deflation pump, and use this means to extract the air. When all air has been extracted the inflation tube should be pinched between the forefinger and thumb of one hand, and the deflation pump and adapter removed from the tube with the other. Keep the inflation tube closed, wet the stopper, or plug, and replace it; ensure that the stopper, or plug, is pushed into the tube as far as it will go. Replace the tube under the retaining loop, and again ensure that the stopper, or plug, is right home. Too much emphasis cannot be placed on the necessity of complete defletion of the suit to prevent expansion of trapped air at high altitudes, and the principles governing deflation of dinghies should be followed, e.g., knife edge creases should appear when complete deflation has been obtained.

22. Fan out the gusset round the top of the front opening of the suit after the two sides of the opening have been brought together (*fig.* 4), and proceed to fold the suit as follows:—

(1) Fold the sleeves across the breast and then down each side of the suit, lay the feet flat on the legs with the toes pointing towards the shoulder line (*fig.* 4). Ease the inflation tube out to the edge of the left sleeve.

(2) Fold the legs upwards to the shoulder line, and fold the right leg back on itself until the heel is in line with the crotch (*fig.* 5).

(3) Fold the suit in half laterally, by placing the left side on top of the right (*fig.* 6). After making this fold ensure that the inflation tube is still in line with the edges of the sleeve and suit.

(4) Fold the suit in half longitudinally, by taking the bottom up to the shoulder line (*fig.* 7), and fold it again in the same direction (*fig.* 8). The folded suit should now measure approximately 15 in. by 10 in., and the helmet should be outside the folds.

(5) Remove the stopper, or plug, from the inflation tube of the cushion, and fold the cushion in half so that its dimensions are the same as the folded suit. Place it on top of the folded suit (*fig.* 9). The stopper, or plug, is left out of the inflation tube so that any air trapped in the cushion can be expelled into the pack, and thence to atmosphere.

24. Insert the suit and cushion into the mouth of the pack (A, *fig.* 10), and continue to stow them, spreading them out towards the sides to make a neat pack. Lay the helmet along the edges of the folded suit and cushion in the mouth of the pack (B, *fig.* 10), and seal the mouth with self-vulcanising solution (C, *fig.* 10). The mouth of the pack is marked in the centre with black lead pencil on both sides of the opening, and when sticking the two surfaces together these two marks should be brought in line first so that the seam is evenly made along the opening.

Instructions for use

25. These instructions are primarily the sequence of operations by which the suit is donned in the K type dinghy. They have been compiled after trials, but may be altered subsequently in the light of experience, or as a result of further investigation. However, it will be appreciated that under the climatic conditions envisaged at the time of an emergency, speed in getting into the suit is of primary importance. It is, therefore, recommended that personnel are encouraged to practice donning the suit in the confined space of a K type dinghy as frequently as possible, in order to become familiar with the system of donning.

26. The following is the sequence of operations :—

(1) Board and sit down in the dinghy, undo the fly buttons on the trousers, remove flying boots or shoes and attach them to the dinghy, and then pull the rip-strip on the pack and withdraw the suit and cushion.

(2) Unfold the suit and lay it along the starboard side of the dinghy in line with the legs, with the feet pointing towards the bow (*fig.* 11). The cushion can be allowed to trail in the water.

(3) Partially deflate the life jacket, partially inflate the suit, open the gusset, and place one leg into the suit through the opening at the top (*fig.* 12).

(4) Insert the other leg into the suit and pull the suit up so that the feet are right home. Rest the shoulders against the buoyancy chamber at the stern, press against the bow with the feet, and arch the back as high as possible. In this position draw the suit under the buttocks (*fig.* 13), resume the sitting position, and draw the suit up under the armpits (*fig.* 14).

(5) Draw the suit up over the shoulders, insert the arms into the sleeves, and put on the helmet (*fig.* 15). When inserting the arms into the sleeves it will be necessary to force the hands through the cuffs which fit tightly round the wrist to exclude water ; any adjustment may be made after the suit has been inflated.

(6) Close the opening at the neck by pulling the cords at both sides of the top of the gusset simultaneously (*fig.* 16), tie the looped ends of the cord together and tuck them into the pocket.

(7) Tie the tapes to close the front of the suit and the helmet, commencing from the bottom ; at the same time spread the gusset evenly under the sides so that the front of the suit presents a reasonably flat surface.

(8) Draw the inflation tube from the fabric loop and remove the stopper, or plug (*fig.* 17). Inflate the suit by blowing through the tube until the whole garment is filled with air.

(9) Bend forward and tie the tapes round the ankles, inflate the cushion and sit on it (*fig.* 18). The tying of the ankle tapes has been left to the last so that the feet uppers may have an opportunity of inflating without restriction.

27. The suit can be donned over wet clothing; it will protect the body from cold and wind, and will prevent loss of heat by evaporation. Moisture which accumulates in the bottom of the suit can be drained out through the drain plug on the inside of each foot.

Note . . .
The plug must be replaced after draining the water.

28. Provision is made for urination through a sleeve in front of the suit. When not in use this sleeve is closed round a key to keep the suit watertight. When required, unwind the cord and unroll the sleeve. After use roll the sleeve round the key, bind it there with the cord, and secure the end of the cord in the slot at the top of the key; the sleeve must be closed after use to retain the waterproof qualities of the whole suit.

29. In the event of the wearer falling into the water, the suit will provide adequate buoyancy (*fig.* 19). For obvious reasons the wearer should float face upwards, and the action of turning on the back in an inflated suit should be practiced as frequently as circumstances permit.

30. In the unlikely event of the suit becoming waterlogged it can be quickly drained by pulling the rip-strips on the side of each leg. It should be remembered that although there will be two holes in the suit, the waterproof and windproof qualities will not be seriously impaired by the action of tearing the rip-strips. The suit should not, therefore be discarded because it has been drained in the manner described.

31. In para. 25 (1) the wearer has been instructed to remove flying boots if worn before donning the suit. This action makes getting into the suit much easier, and also prevents damage due to tearing; the material of the suit is thin and any sharp projections on boots or shoes may tear the inner layer of fabric. The question of whether flying boots should be worn over the suit has not been finalised, although there is a trend of thought which is in favour of wearing them. However, it will be readily appreciated that to put them on after the suit has been inflated will be extremely difficult and have the effect of forcing the insulation, air, from the region of the feet. It is, therefore, recommended that boots are not worn over the suit when in a dinghy.

Servicing

32. Servicing will normally be confined to the examination of the sealed pack for tears, stains, or other damage or deterioration which may arise as a result of use. Provided the pack is serviceable it can be assumed that its contents are also serviceable. Occasions may, however, arise when it is desirable, or necessary, to examine the complete equipment in more detail and to subject the suit and cushion to inflation tests; the equipment is to be repacked using a new pack (*Stores Ref.* 22C/1384) after it has been examined and tested, the old pack being disposed of in accordance with current procedure.

33. The following tests are to be applied on instruction from Admiralty or Air Ministry, as appropriate, or in accordance with instructions contained in the servicing schedules:—

(1) Suit. The suit should be opened out and laid flat on a smooth-topped table, and inflated with air to an internal pressure equal to a 30 cms. head of water, it should retain this pressure for five minutes. The inflation tube should then be sealed, and during the next five minutes the internal pressure should not drop below the equivalent of a 12 cms. head of water. During this test the anchorage patches and seams should not lift or become detached.

(2) Cushion. The cushion should be inflated with air to an internal pressure equal to a 30 cms. head of water and sealed off. At the end of one hour there should be no appreciable signs of softening.

Suitable adapters will be required for coupling the suit and cushion to an air supply and to the manometer; these can be provided locally by using rubber tubing.

34. All unserviceable equipment is to be returned to the appropriate Maintenance Unit where the necessary arrangements for test and repair will be made.

Mk. 2 ASSEMBLY

35. This suit is illustrated in fig. 20 and 21, the packing is illustrated in fig. 22 and 23 and donning is similar to that for the Mk. 1 suit illustrated in fig. 11 to 18. The assembly consists of the following items :—

(1) The suit (*Stores Ref.* 22C/1544) complete with visor which protects the wearer from the effects of exposure.

(2) The cushion (*Stores Ref.* 22C/1128) which provides a comfortable seat in the dinghy and insulation for the buttocks.

(3) The pack in which the suit and cushion are stowed. This pack bears the Stores Reference of the complete assembly on the outside.

Description

Suit

36. The suit (*fig.* 20 *and* 21) is made from two layers of single-ply rubber-proofed fabric dyed yellow. It is constructed on similar lines to the Mk. 1 suit (*para.* 4 *to* 19), but there are, however, no rip-strips at the sides of the legs and there are other differences which are explained in para. 37 to 39.

37. *Helmet.* A transparant visor made from clear polythene is welded to a length of P.V.C. coated material and stitched to the top edge of the helmet. This visor protects the face and is tucked inside the sides of the helmet and into the top of the gusset before the suit is fastened after donning.

38. *Gusset.* The gusset is not a separate piece of material ; it is made by extending the width of the outer layer of fabric in front of the suit from the crotch to a position approximately 3 in. above the neckline. This provides the necessary fullness which makes the donning of the suit easier.

39. *Inflation tube.* There are two of these tubes, one at each wrist. This enables the suit to be inflated at either side. Each tube terminates in a valve which is, for all practical purposes, self-sealing and plugs or stoppers are therefore unnecessary. At the base of each tube is a white disc bearing the following "TO DEFLATE SQUEEZE AT ARROWS" and each tube carries a label with the following instructions "AFTER INFLATION DOUBLE BACK TUBE AND PLACE IN TUNNEL LOOP"; this tunnel is just above the tube on the sleeve.

Cushion

40. The cushion is described in para. 20.

Pack

41. The pack is similar to that described in para. 21, but instead of having holes along the top edges through which air is expelled the corners of the pack are left open to serve the same purpose.

Folding and packing the Mk. 2 suit and cushion

42. Lay the suit on a flat smooth surface, such as a parachute packing table, lay the cushion beside the suit, and thoroughly deflate both items. To deflate the suit grip the two inflation tubes at their bases with a "Bulldog" type of clip or similar clip and roll the suit tightly from the feet towards the helmet ; any air trapped between the two layers of fabric can be squeezed out through the inflation tubes at the cuffs. The clips on the inflation tubes can be left in position until the folding is completed.

43. To fold the suit, proceed as follows :—

(1) Fold the suit in half longitudinally (*fig.* 22 (1)), roll the urinating sleeve and close it with the cord ; make sure that the sleeve is outside the line of the fold.

(2) Fold the arms across the body, one on top and one underneath (*fig.* 22 (2)), and double the visor over. Make sure that the inflation tubes protrude beyond the edge of the folded suit.

(3) Fold the suit laterally towards the feet. The first fold (*fig.* 22 (3)) should be approximately 1 in. shorter than the width of the pack, i.e., about 9 in. wide ; subsequent folds (*fig.* 22 (4) *to fig.* 23 (8)) reduce the length of the suit until it is approximately the same width as the pack, namely, 10 in. Keep the cushion outside the folds.

(4) Turn the feet upwards over the folded suit, one on top and one underneath (*fig.* 23 (9)). Do not fit the plugs over the drain holes.

(5) Fold the cushion in half and place it on top of the suit (*fig.* 23 (10)). Do not fit the plug into the inflation tube.

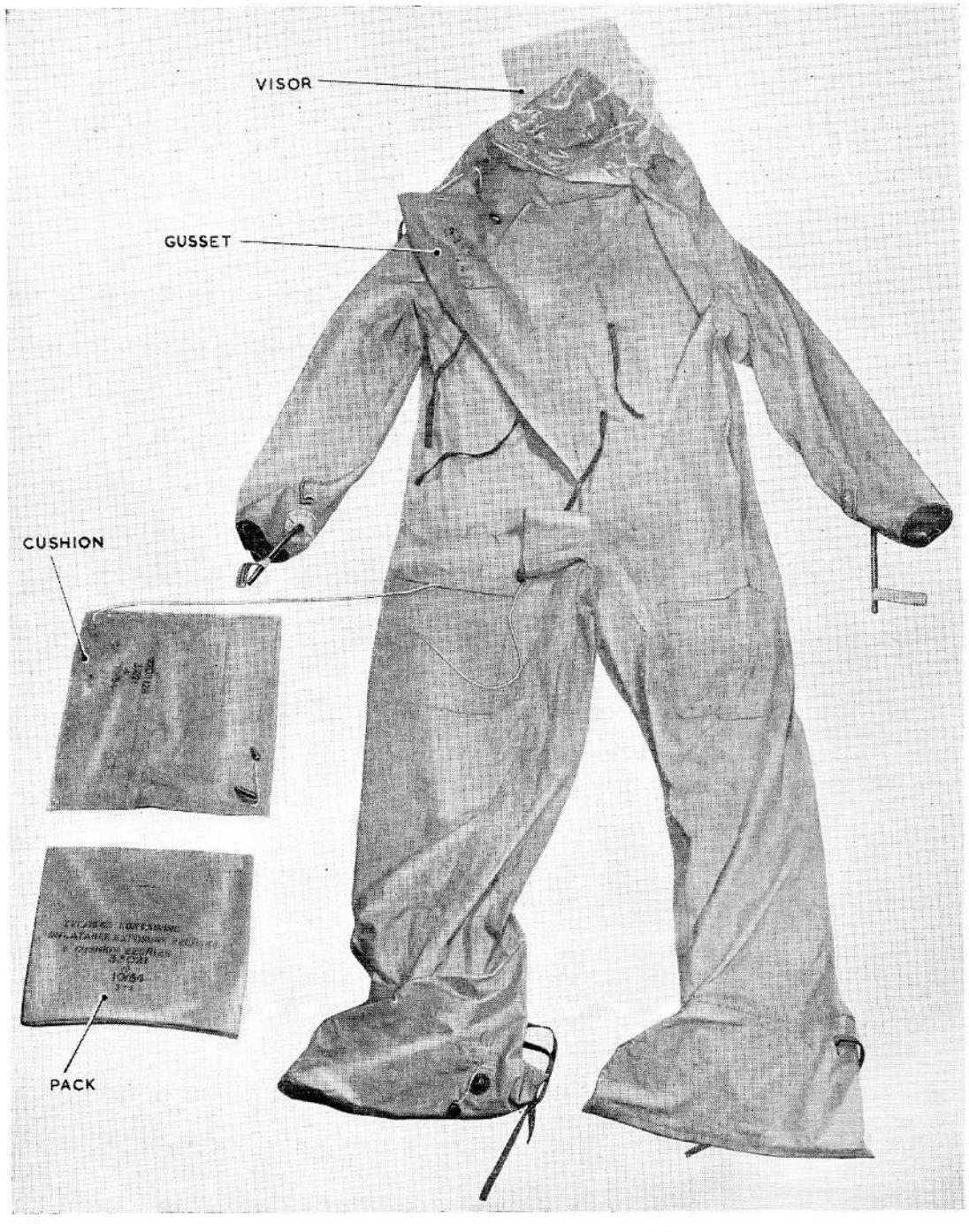


Fig. 20. Mk. 2 suit, cushion and pack

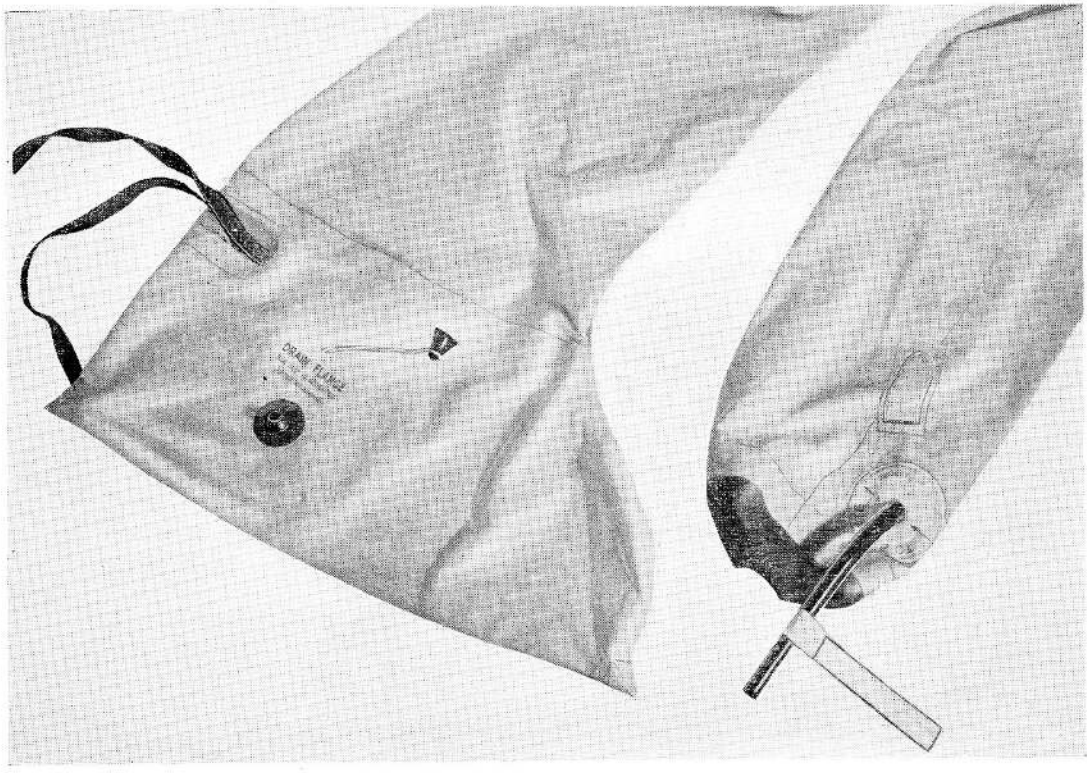


Fig. 21. Draining and inflation points

Note . .

The plugs are left out of the inflation tube of the cushion and are not fitted over the drain holes in the feet of the suit to allow any air which may enter to be expelled when the user sits on the dinghy pack in which the assembly is stowed.

44. Insert the suit and cushion into the pack, after removing the "Bulldog" or other type of clip from the inflation tubes at the wrists, and tuck in the urinating sleeve and inflation tubes along the sides of the pack (*fig.* 23 (11)). Spread the suit and cushion out so that they fill the corners of the pack and make sure that the package is as flat as possible.

45. Prepare a wooden jig, 15 in. long, 10 in. wide and 1·3 in. deep. Place the pack in the jig and, with a platform covering the jig weighted to 145 lb., ensure that the pack conforms to the dimensions. It is important that the pack should not be more than 1·3 in. deep when confined in a space 15 in. by 10 in., if it is deeper than 1·3 in. the contents are to be re-arranged or re-packed as necessary. When the pack has been satisfactorily tested in the jig, seal the mouth with self-vulcanising solution.

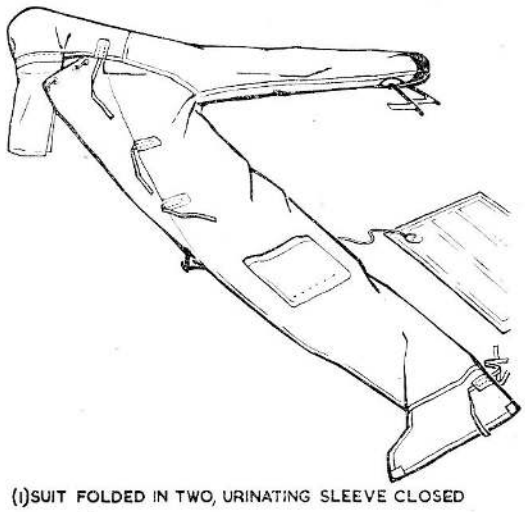
Instructions for use

46. The instructions for use are basically the same as those in para. 25 to 31, but since the suit does not have rip-strips at the sides of the legs the information in para. 30 does not apply.

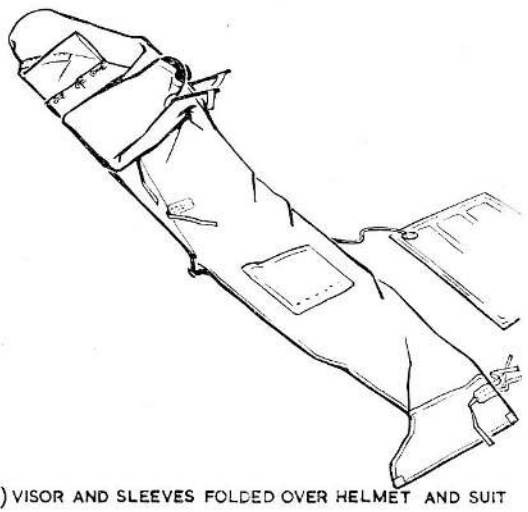
47. When inflating the suit, remember that there are two inflation tubes and that these tubes are not sealed with plugs; make sure that the inflation tubes are doubled back and inserted in the tunnel loops after inflation. The suit also has only three pairs of light webbing tapes for fastening the front instead of four.

Servicing

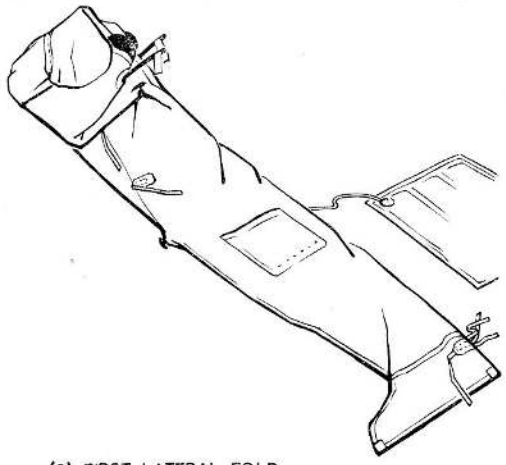
48. The information in para. 32 to 34 is basically correct, but since spare packs have not yet been provisioned for the Mk. 2 assembly the instructions regarding re-packing should be referred to the appro-



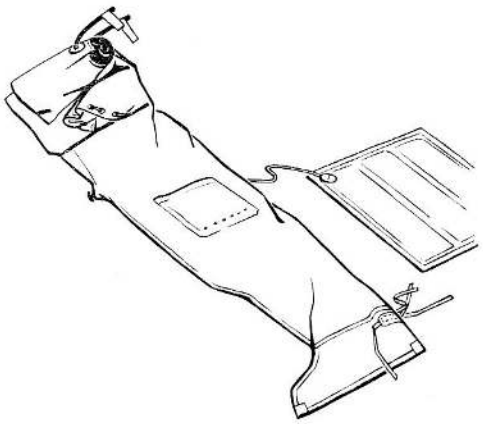
(1)SUIT FOLDED IN TWO, URINATING SLEEVE CLOSED



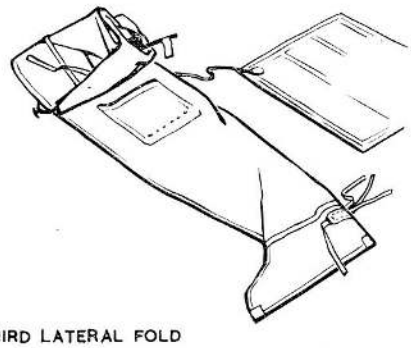
(2) VISOR AND SLEEVES FOLDED OVER HELMET AND SUIT



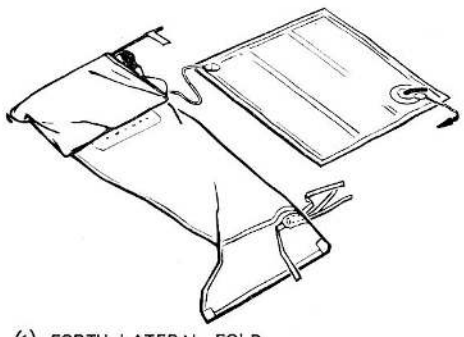
(3) FIRST LATERAL FOLD



(4) SECOND LATERAL FOLD



(5) THIRD LATERAL FOLD

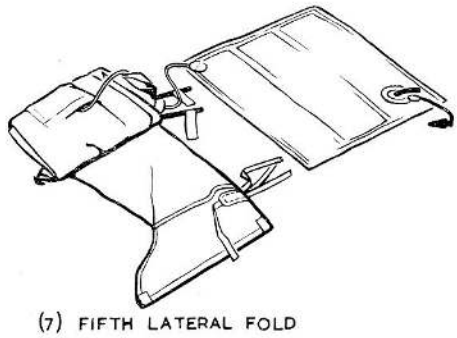


(6) FORTH LATERAL FOLD

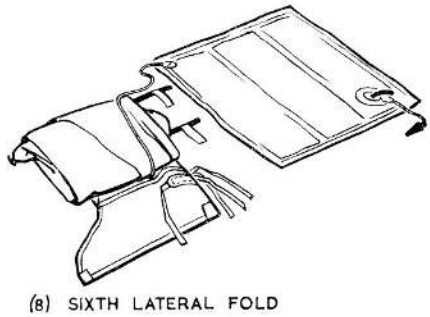
Fig. 22. Folding and packing : operations 1 to 6

priate authority for confirmation regarding the use of new packs. Spare packs (*Stores Ref.* 22C/1384) can be used, since they are of the same overall dimensions.

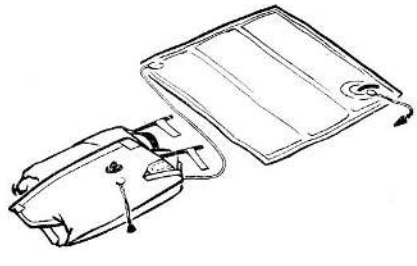
49. The cushion of this assembly is to be tested according to the instructions in para. 33 (2).



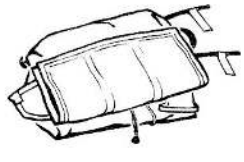
(7) FIFTH LATERAL FOLD



(8) SIXTH LATERAL FOLD



(9) FEET FOLDED UPWARDS ON SUIT



(10) CUSHION FOLDED ON SUIT

(11) SUIT AND CUSHION STOWED IN PACK, MOUTH OF PACK UNSEALED

Fig. 23. Folding and packing : operations 7 to 11

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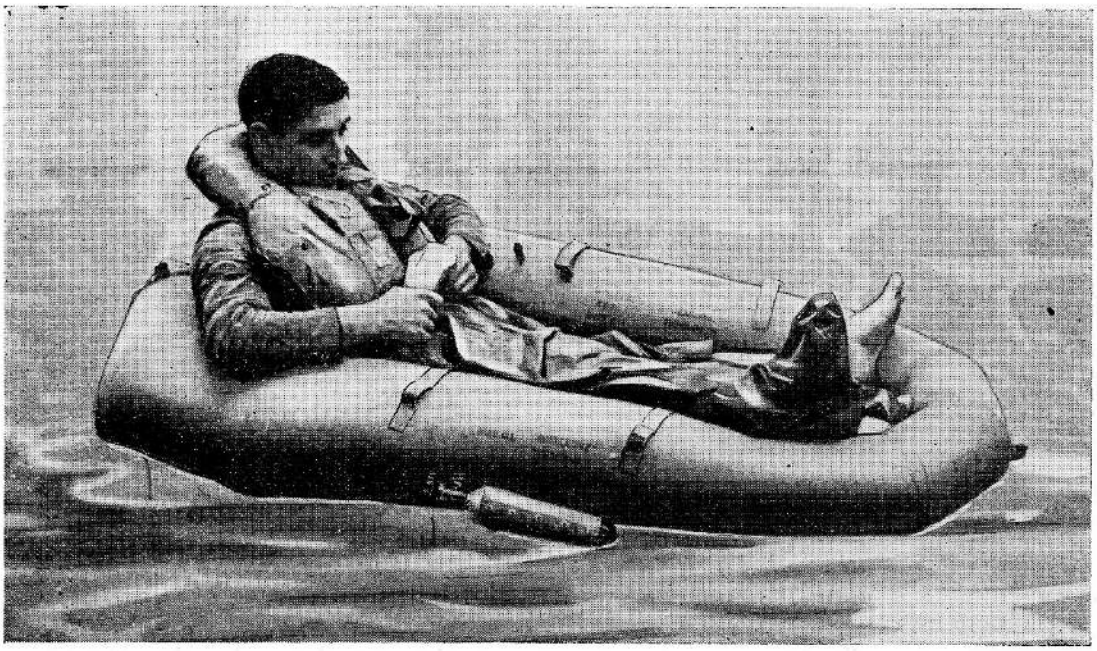

Fig. 12. Right leg placed in suit

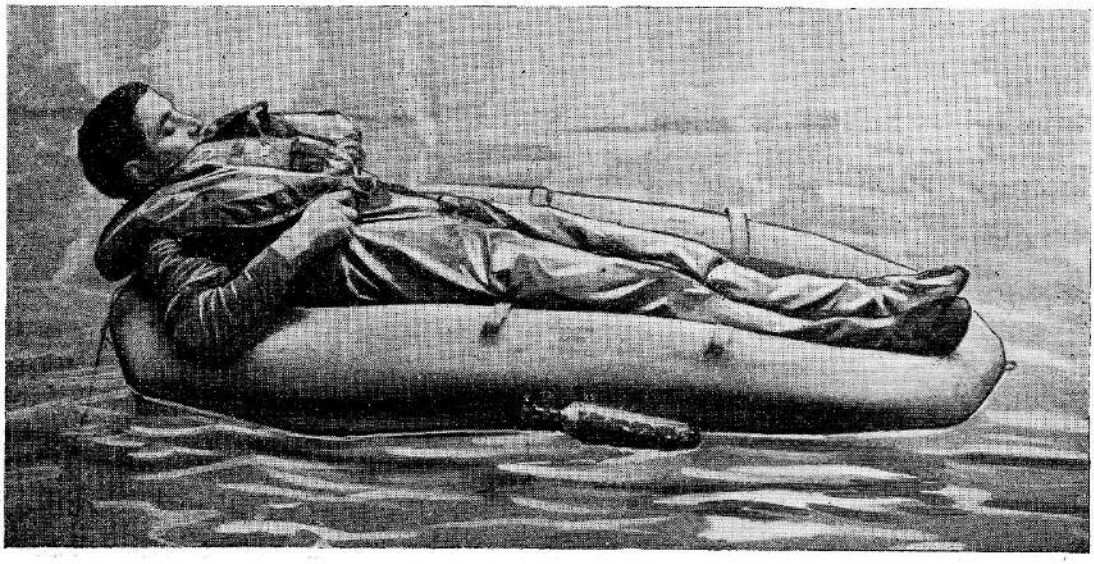

Fig. 13. Body arched and suit being pulled up under buttocks

Fig. 14. Suit pulled up under armpits

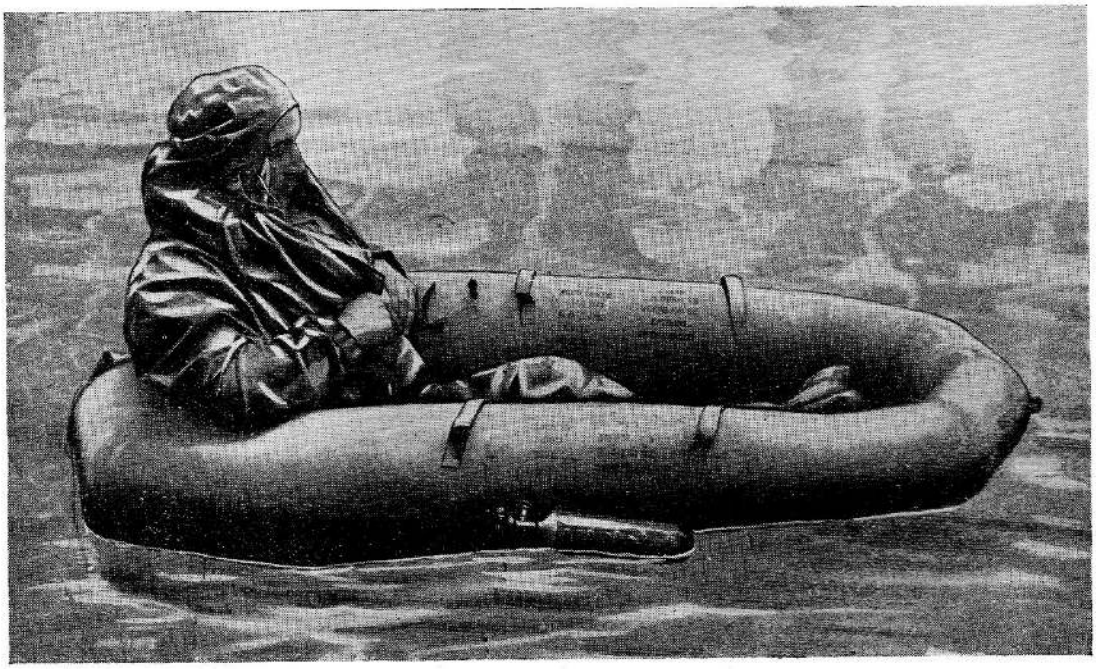

Fig. 15. Suit donned ready for fastening

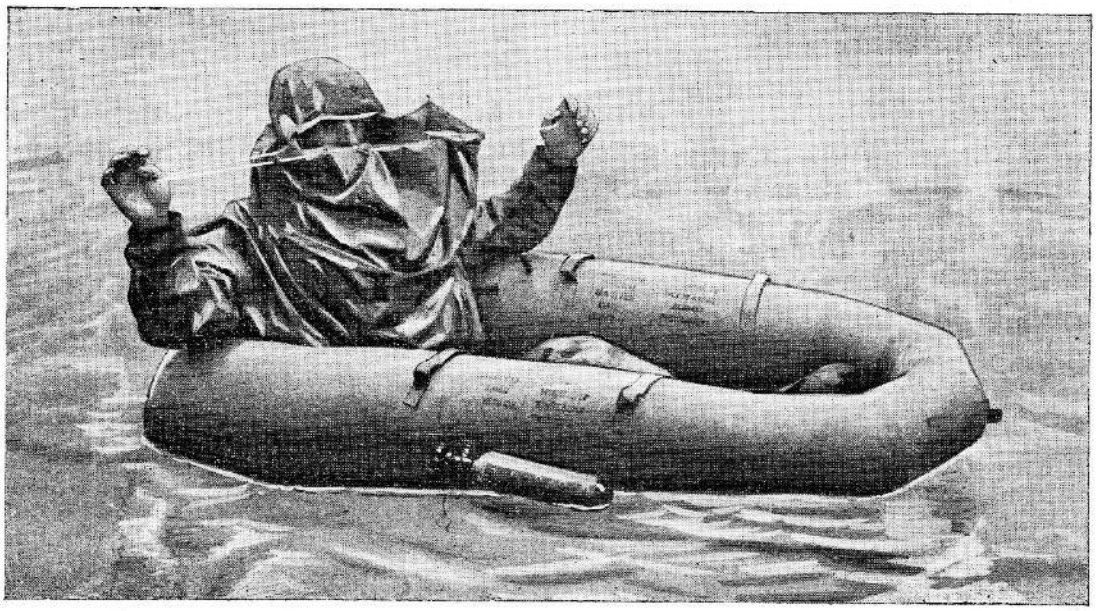

Fig. 16. Gusset being closed by draw cord at neck

Fig. 17. Tapes in front of suit tied and tube ready for inflation

Fig. 18. Suit and cushion inflated and tapes tied round ankles

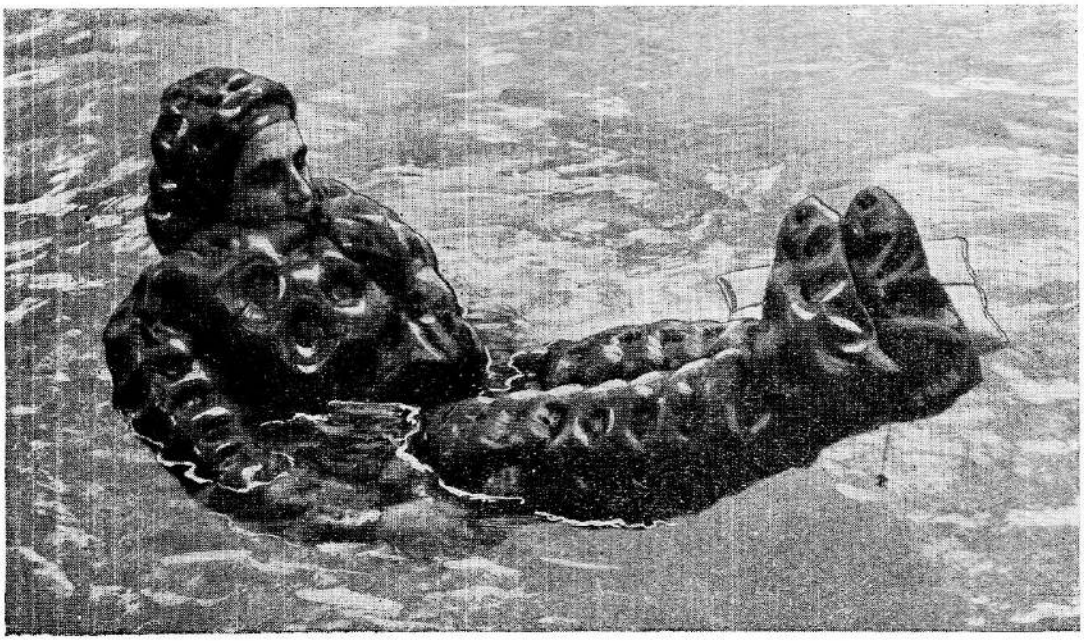

Fig. 19. Floating in water with exposure suit inflated

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Mk. 2 ASSEMBLY

35. This suit is illustrated in fig. 20 and 21, the packing is illustrated in fig. 22 and 23 and donning is similar to that for the Mk. 1 suit illustrated in fig. 11 to 18. The assembly consists of the following items :—

(1) The suit (*Stores Ref.* 22C/1544) complete with visor which protects the wearer from the effects of exposure.

(2) The cushion (*Stores Ref.* 22C/1128) which provides a comfortable seat in the dinghy and insulation for the buttocks.

(3) The pack in which the suit and cushion are stowed. This pack bears the Stores Reference of the complete assembly on the outside.

Description

Suit

36. The suit (*fig.* 20 *and* 21) is made from two layers of single-ply rubber-proofed fabric dyed yellow. It is constructed on similar lines to the Mk. 1 suit (*para.* 4 *to* 19), but there are, however, no rip-strips at the sides of the legs and there are other differences which are explained in para. 37 to 39.

37. *Helmet.* A transparant visor made from clear polythene is welded to a length of P.V.C. coated material and stitched to the top edge of the helmet. This visor protects the face and is tucked inside the sides of the helmet and into the top of the gusset before the suit is fastened after donning.

38. *Gusset.* The gusset is not a separate piece of material ; it is made by extending the width of the outer layer of fabric in front of the suit from the crotch to a position approximately 3 in. above the neckline. This provides the necessary fulness which makes the donning of the suit easier.

39. *Inflation tube.* There are two of these tubes, one at each wrist. This enables the suit to be inflated at either side. Each tube terminates in a valve which is, for all practical purposes, self-sealing and plugs or stoppers are therefore unnecessary. At the base of each tube is a white disc bearing the following "TO DEFLATE SQUEEZE AT ARROWS" and each tube carries a label with the following instructions "AFTER INFLATION BEND BACK ORAL TUBE AND PASS THROUGH LOOP" ; this loop is just above the tube on the sleeve.

Cushion

40. The cushion is described in para. 20.

Pack

41. The pack is similar to that described in para. 21, but instead of having holes along the top edges through which air is expelled the corners of the pack are left open to serve the same purpose.

Folding and packing the Mk. 2 suit and cushion

42. Lay the suit on a flat smooth surface, such as a parachute packing table, lay the cushion beside the suit, and thoroughly deflate both items. To deflate the suit grip the two inflation tubes at their bases with a "Bulldog" type of clip or similar clip and roll the suit tightly from the feet towards the helmet ; any air trapped between the two layers of fabric can be squeezed out through the inflation tubes at the cuffs. The clips on the inflation tubes can be left in position until the folding is completed.

43. To fold the suit, proceed as follows :—

(1) Fold the suit in half longitudinally (*fig.* 22 (1)), roll the urinating sleeve and close it with the cord ; make sure that the sleeve is outside the line of the fold.

(2) Fold the arms across the body, one on top and one underneath (*fig.* 22 (2)), and double the visor over. Make sure that the inflation tubes protrude beyond the edge of the folded suit.

(3) Fold the suit laterally towards the feet. The first fold (*fig.* 22 (3)) should be approximately 1 in. shorter than the width of the pack, i.e., about 9 in. wide ; subsequent folds (*fig.* 22 (4) *to fig.* 23 (8)) reduce the length of the suit until it is approximately the same width as the pack, namely, 10 in. Keep the cushion outside the folds.

(4) Turn the feet upwards over the folded suit, one on top and one underneath (*fig.* 23 (9)). Do not fit the plugs over the drain holes.

(5) Fold the cushion in half and place it on top of the suit (*fig.* 23 (10)). Do not fit the plug into the inflation tube.

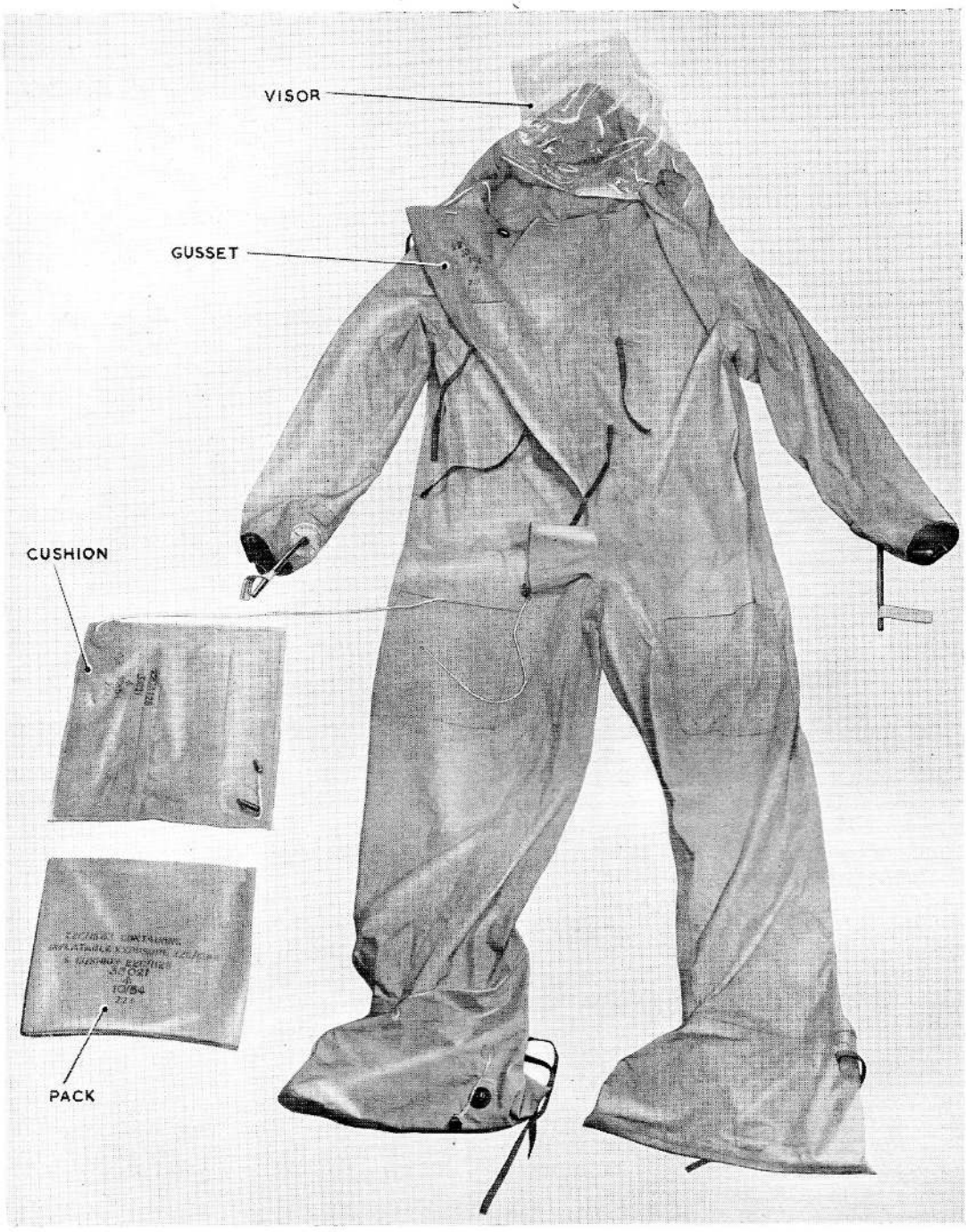


Fig. 20. Mk. 2 suit, cushion and pack

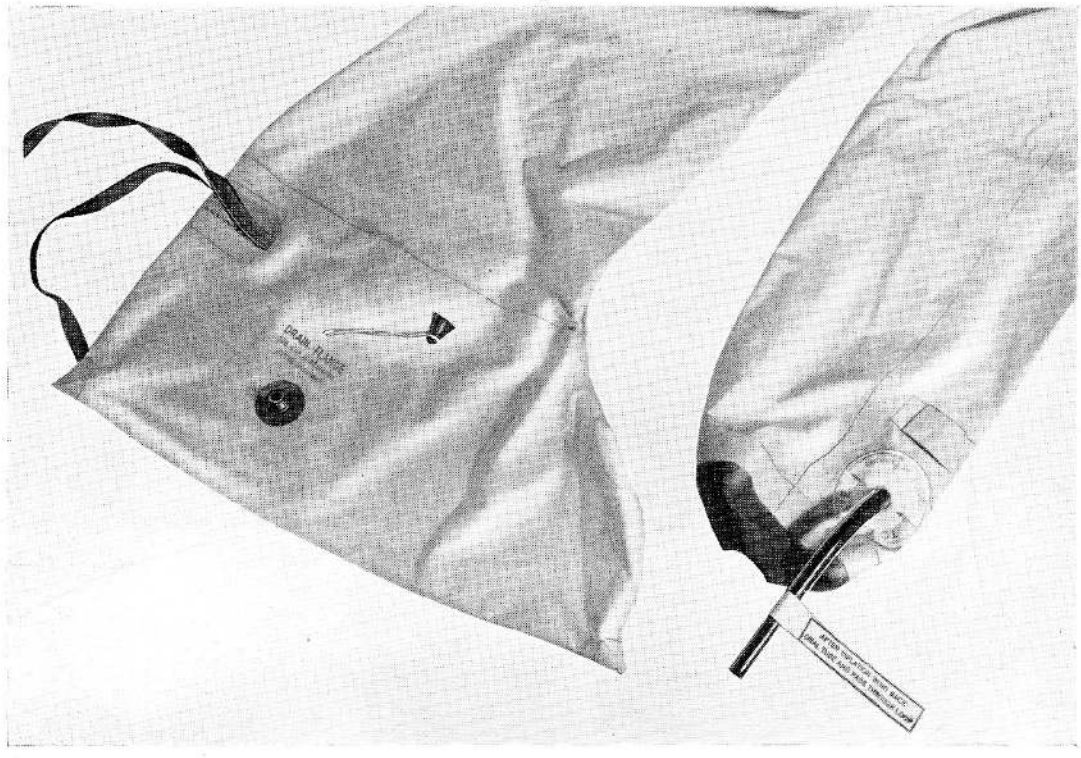


Fig. 21. Draining and inflation points

Note . .

The plugs are left out of the inflation tube of the cushion and are not fitted over the drain holes in the feet of the suit to allow any air which may enter to be expelled when the user sits on the dinghy pack in which the assembly is stowed.

44. Insert the suit and cushion into the pack, after removing the "Bulldog" or other type of clip from the inflation tubes at the wrists, and tuck in the urinating sleeve and inflation tubes along the sides of the pack (*fig.* 23 (11)). Spread the suit and cushion out so that they fill the corners of the pack and make sure that the package is as flat as possible.

45. Prepare a wooden jig, 15 in. long, 10 in. wide and 1·3 in. deep. Place the pack in the jig and, with a platform covering the jig weighted to 145 lb., ensure that the pack conforms to the dimensions. It is important that the pack should not be more than 1·3 in. deep when confined in a space 15 in. by 10 in., if it is deeper than 1·3 in. the contents are to be re-arranged or re-packed as necessary. When the pack has been satisfactorily tested in the jig, seal the mouth with self-vulcanising solution.

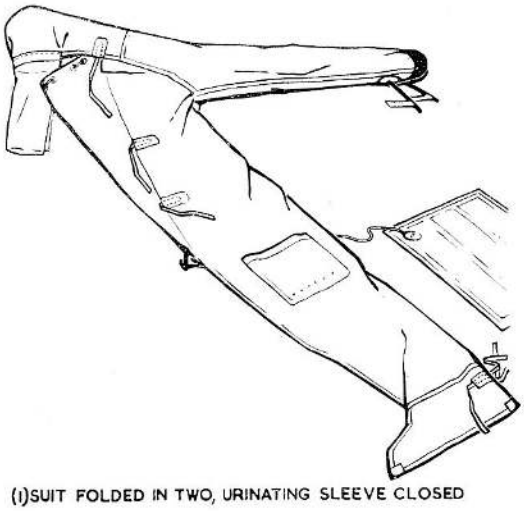
Instructions for use

46. The instructions for use are basically the same as those in para. 25 to 31, but since the suit does not have rip-strips at the sides of the legs the information in para. 30 does not apply.

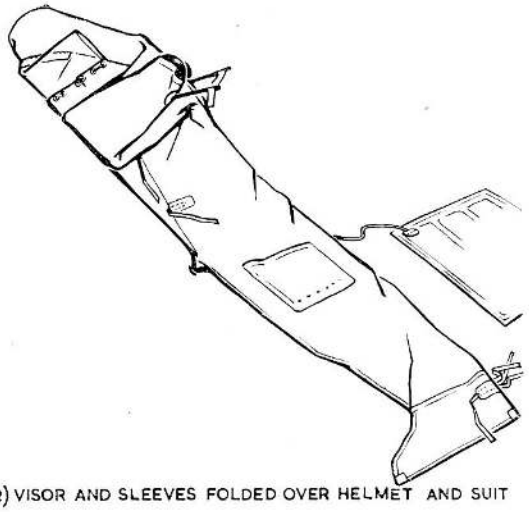
47. When inflating the suit, remember that there are two inflation tubes and that these tubes are not sealed with plugs. The suit also has only three pairs of light webbing tapes for fastening the front instead of four.

Servicing

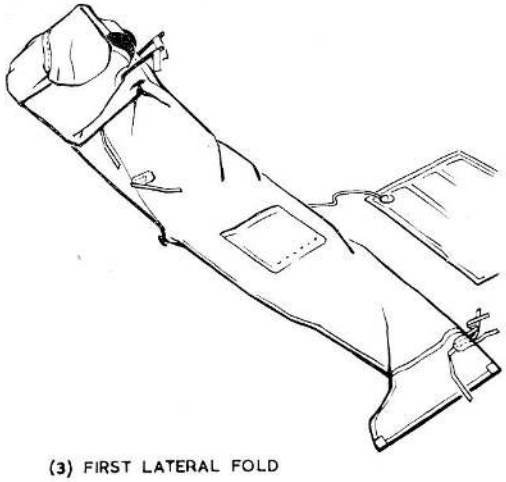
48. The information in para. 32 to 34 is basically correct, but since spare packs have not yet been provisioned for the Mk. 2 assembly the instructions regarding re-packing should be referred to the appro-



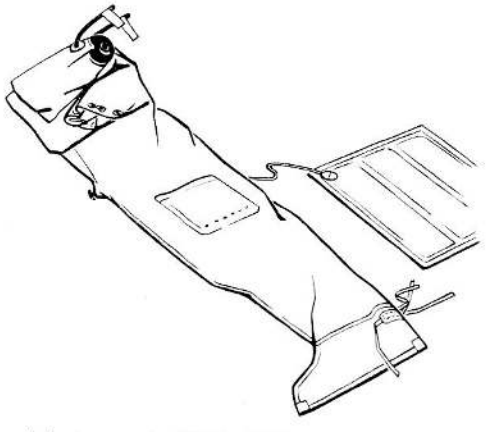
(1)SUIT FOLDED IN TWO, URINATING SLEEVE CLOSED



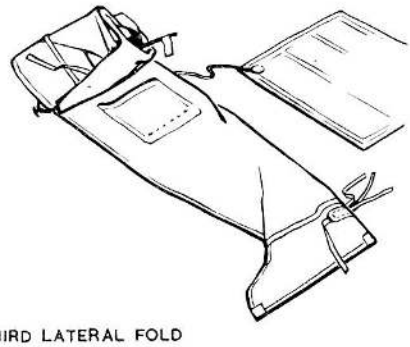
(2) VISOR AND SLEEVES FOLDED OVER HELMET AND SUIT



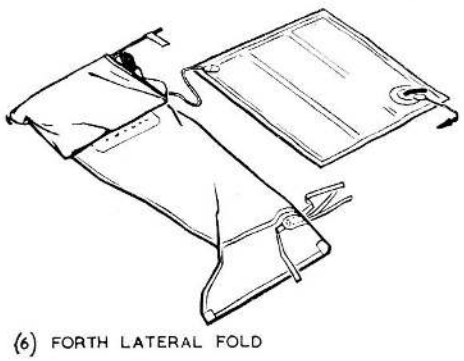
(3) FIRST LATERAL FOLD



(4) SECOND LATERAL FOLD



(5) THIRD LATERAL FOLD

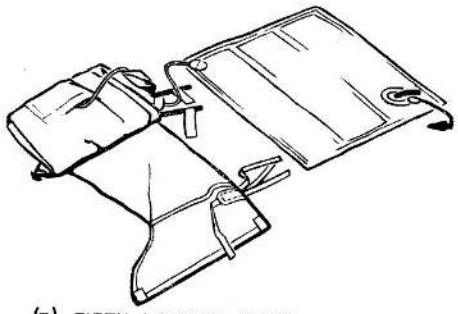


(6) FORTH LATERAL FOLD

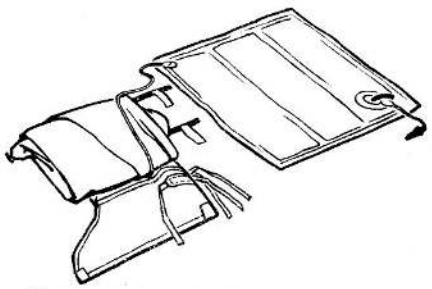
Fig. 22. Folding and packing : operations 1 to 6

priate authority for confirmation regarding the use of new packs. Spare packs (*Stores Ref.* 22C/1384) can be used, since they are of the same overall dimensions.

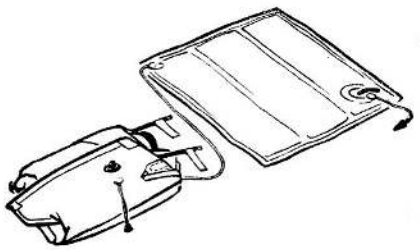
49. With regard to para. 33 (2), the cushion of this assembly is to be inflated to 3 lb. p.s.i. and this pressure maintained for one minute. During this time there should be no signs of any points of attachment either peeling or becoming detached. The cushion is then to be deflated and reinflated to a pressure equivalent to a 30 cms. head of water. The source of air supply is then closed and during the following five minutes the cushion pressure must not fall below the equivalent of a 28 cms. head of water.



(7) FIFTH LATERAL FOLD



(8) SIXTH LATERAL FOLD



(9) FEET FOLDED UPWARDS ON SUIT

(10) CUSHION FOLDED ON SUIT

(11) SUIT AND CUSHION STOWED IN PACK, MOUTH OF PACK UNSEALED

Fig. 23. Folding and packing : operations 7 to 11

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