A suture device comprises an adhesive strip or pad (1) having disposed along one edge a series of lateral threads (6) each intended in use to be tied to an opposing thread on a similar suture device, characterised in that the threads are supported on a carrier (7) extending substantially the length of the threads, each thread being attached to the carrier, at least at its distal end, but disposed so that a usable portion of the end proximal to the strip can be detached from the carrier for cutting and tying.
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ADHESIVE SUTURE PRESENTATION

This invention relates to adhesive sutures of the type comprising a series of parallel threads attached to one edge of an adhesive strip, and in particular to a presentation for such an adhesive suture device to provide easier application and use by the surgeon.

Adhesive suture devices of the general type where the suture threads are attached to an adhesive strip applied to the surface of the skin, rather than being sewn directly through the skin and tissue, have been known for many years. In particular see British Patent GB 2 083 753B. This invention is concerned with the type used in pairs, one on either side of an incision, each thread on one strip being tied to the opposing thread on the other strip. Each strip thus has a parallel array of long threads which must be kept in an ordered fashion if they are to be used successfully. The threads are inevitably longer than necessary to allow for ease of tying and trimming. They are typically silk yarn or synthetic fibre alternatives, and
are typically from 10cm to 20cm long. With a number of such threads, it is very easy for the wrong threads to be tied together, or for threads to get twisted together or to invade the incision. In order to minimise these problems, it has been proposed to attach the far, or distal, ends of the threads to a common cross-piece which can be discarded after the threads have been cut free. However, this does not remove the problem, especially if the suture threads are in any degree stiff or resilient. There is thus a need for a simple presentation which enables pairs of threads to be selected as required, remaining threads being kept well out of the way.

It is the object of this invention to provide a simple means of achieving this goal. According to the invention there is provided a suture device comprising an adhesive strip or pad having disposed along one edge a series of lateral threads each intended in use to be tied to an opposing thread on a similar suture device, characterised in that the threads are supported on a carrier extending substantially the length of the threads, each thread being attached to the carrier, at least at its distal end, but disposed so that a usable portion of the end proximal to the strip can be detached from the carrier for cutting and tying.
The carrier may conveniently comprise a flat sheet of rigid or semi-rigid material, for example card or plastic, or alternatively may comprise a generally planar frame, for example moulded from a plastics material such as polystyrene. The carrier is conveniently flat, but may alternatively be curved or arched.

In one embodiment, the carrier is attached to the proximal ends of the threads, either with adhesive, or by means of a removable or rupturable film or tape. In either construction, the end of the carrier effectively abuts the edge of the adhesive strip and the threads are held firmly against the carrier until the device is used. On use, the threads are detached from the carrier which can then be folded out of the way as explained in more detail below.

It is particularly preferred that the carrier is disposed on the same side of the plane of the threads from that of the adhesive surface of the adhesive strip, preferably with the release web for the adhesive surface fixed to the end of the carrier. In use, the carrier can then be detached from the adhesive strip, along with the release web and then pivoted about its distal end through 180° to act as a handle for holding the threads taut between the adhesive strip and the carrier. The suture device can be applied to the skin on one side of
the incision with the threads on the carrier extending across the incision, and the carrier and threads can then be folded back over the adhesive strip so that the threads extend away from the incision and the carrier acts as a weight to hold them taut. A second suture device can then be applied to the other side of the incision and folded back as a mirror image of the first.

The presentation is constructed so that a usable portion of the ends of the threads proximal to the adhesive strip can be detached from the carrier for cutting and tying to the threads opposite. Thus, in practice, opposed pairs of threads will be detached from the carrier, from the edge of the adhesive strip along as great a portion of the length of each thread as is required for tying, and then can be cut free, leaving the unwanted distal end still attached to the carrier. In turn, successive pairs of threads can be detached and cut free and tied together. When the last thread from each device is cut free, the carriers, still having attached thereto all the discarded distal ends, can be thrown away.

The advantage of the presentation according to the invention lies in the use of a rigid or semi-rigid carrier extending substantially the length of the threads which holds them in an ordered flat state until the device is used and then holds them relatively taut.
in a direction away from the incision until they are individually required. Thus, instead of having to deal with an intractable mass of loose threads which may be floppy or resilient, and which may become wrongly paired or which may invade the wound, the surgeon is presented with two folded back sets of threads, each attached at the distal end to a carrier from which threads can be detached with ease.

The adhesive strip or pad may be constructed of any conventional materials, such as a woven fabric or sheet plastic, but for preference we use a sheet of foamed polyurethane or polyethylene, or most conveniently two such sheets with the ends of the threads sandwiched therebetween. The ends of the threads may be attached to the strip simply by adhesive action and/or embedding, or alternatively may be anchored on anchoring means in the strip, for example discs around which the threads can be wound in the manner of a "treasury tag", or tabs under which the thread can be trapped. The threads can be attached to the carrier by their distal ends only (in which case the proximal end of the carrier must be removably attached to the strip itself; or the threads may be attached at both their distal and proximal ends (in which case the carrier need not be attached to the strip directly); or the carrier may be sufficiently adhesive for the threads to be detachably held along a major part of their length.
By way of example, two embodiments of the invention will now be described with reference to the accompanying drawings in which:

Figure 1 is a perspective view of one presentation;
Figure 2 is a schematic side view of this presentation;
Figure 3 shows two such presentations in use;
Figure 4 is a schematic side view of a second presentation;
Figure 5 is a view of the second presentation in use.
Figure 6 is an exploded view of our presentation; and
Figure 7 is a representation of the assembly sequence.

In Figures 1 and 2, an adhesive pad 1 comprises two layers of foamed plastic 2, 3 having a coating of pressure sensitive adhesive 4 covered by a release sheet 5. From an edge of the pad 1 extend a number of threads 6 arranged in a parallel array on a carrier card 7. Distal ends of the threads 6 are sandwiched between an end tab 8 and the card 7. Proximal ends of the threads (adjacent the adhesive pad 1) are fixed to the card 7 by means of a removable or rupturable tape 9. Figure 1 shows the presentation upside-down, while Figure 2 shows the device the right way up, i.e. with the adhesive 4 underneath. In use, the tape 9 is removed or ruptured,
the release paper 5 is removed and the adhesive pad 1 is pressed to the skin on one side of an incision 10. The card 7 carrying the threads 6 is then folded over the end tab 8 about a pivot 11 transverse to the distal ends of the threads 6 (in a clockwise direction in Figure 2) and lies flat as shown in Figure 3. A second adhesive suture is applied to the opposite side of the incision 10 and folded back in a mirror image. The surgeon can then cut individual threads on each card 7, in opposed pairs, and tie them across the incision. The remaining threads 6 are held neatly in place on the cards 7 during this operation. When all the pairs of threads 6 have been cut and tied, the cards 7 having affixed thereto the end tabs 8 and the distal portions of the threads 6, can be discarded.

In a preferred embodiment, as shown in Figure 4, the adhesive pad 1 again comprises two layers of foamed plastic 2, 3 holding the proximal ends of threads 6, the distal ends of which are held between an end tab 8 and a backing card 7. However, in this embodiment the adhesive 4 is applied to the pad 1 on the same side of the threads 6 as the card 7 (i.e. underneath in Figure 4 as opposed to above in Figure 2) and is covered with the release paper 5 which is attached to the card 7. In use, as shown in Figure 4, the release paper is removed and the pad 1 is applied to the skin on one side of the incision 10. In this case, the card 7 and threads 6 are
folded back over the pad 1 and then the card 7 is inverted over the distal ends of the threads 6 as shown in Figure 4. As before, individual threads 6 can then be cut and tied to opposite threads. However, in this embodiment the extreme distal ends of the threads 6 are visible and accessible, so that a longer length of thread is available for cutting. At the end of this operation, the card 7 carrying the end tab 8 and the distal portions of the threads 6 can be discarded.

As shown in Figure 7, the presentations can be constructed from endless webs brought into the correct alignment and caused to adhere together and then cut into lengths each forming one presentation.
CLAIMS:

1. A suture device comprising an adhesive strip or pad having disposed along one edge a series of lateral threads each intended in use to be tied to an opposing thread on a similar suture device, characterised in that the threads are supported on a carrier extending substantially the length of the threads, each thread being attached to the carrier, at least at its distal end, but disposed so that a usable portion of the end proximal to the strip can be detached from the carrier for cutting and tying.

2. A suture device according to claim 1, in which the carrier is arranged so that, in use, it can be folded back about an axis transverse to the distal ends of the threads to act as a handle and/or a weight to hold the threads relatively taut and away from the incision.

3. A suture device according to claim 1 or claim 2, in which the carrier comprises a card.

4. A suture device according to any of claims 1 to 3, in which the proximal end of the carrier is attached to a release web for the adhesive.

5. A suture device according to any of claims 1 to 3, in which the proximal end of the carrier is attached to the proximal ends of the threads.
INTERNATIONAL SEARCH REPORT

International Application No PCT/GB 90/00737

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all)

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC: A 61 B 17/08

II. FIELDS SEARCHED

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

III. DOCUMENTS CONSIDERED TO BE RELEVANT

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<td>GB, A, 2083753 (REYADH KADHIM ROOMI) 31 March 1982 see page 2, lines 17-25; figure 5 cited in the application</td>
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*** Document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

**** Document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

***** Document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search: 7th September 1990

Date of Mailing of this International Search Report: 27.09.90

International Searching Authority: EUROPEAN PATENT OFFICE

Signature of Authorized Officer: Mme N. KUIPER
ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO. GB 9000737
SA 36694

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