April 17, 1962 W. HIRSCH ETAL 3,029,818

NEUROLOGICAL SPONGE

Filed June 16, 1959

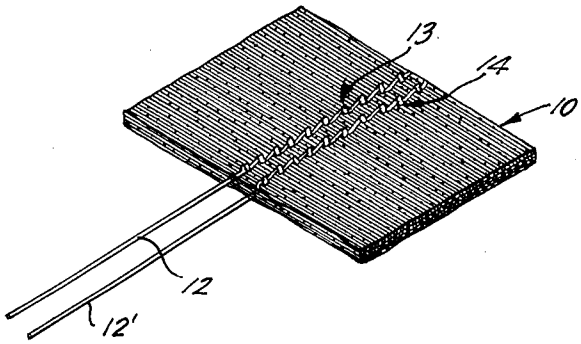


FIG. 1

FIG. 2

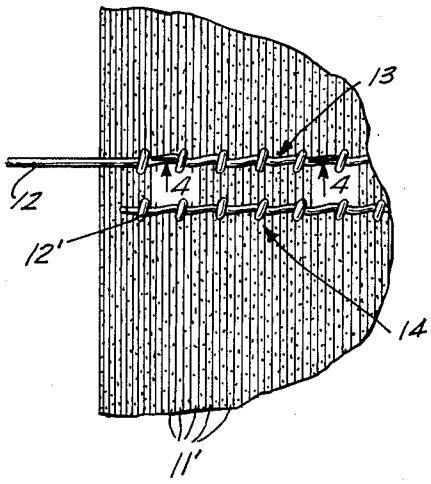


FIG. 3

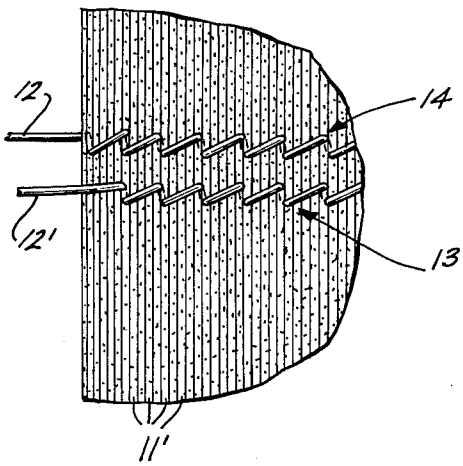
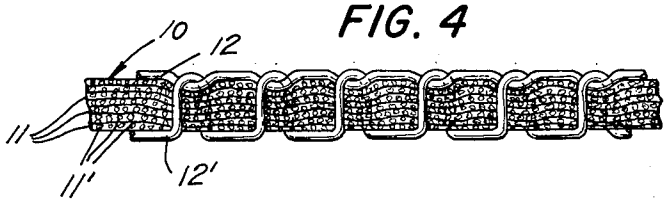


FIG. 4



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United States Patent Office 3,029,818 Patented Apr. 17, 1962

3,029,818

NEUROLOGICAL SPONGE

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Filed June 16, 1959, Ser. No. 820,731
2 Claims. (Cl. 128—296)

This invention relates to absorbent elements especially intended for use in difficult surgery, such as brain surgery, although its application is not limited to that type of surgery.

Absorbent elements employed in surgical operations are well known in the form of tampons which are usually made by applying absorbent cotton about either a wooden support or held in suitable surgical instruments. However these types of tampons are not safe for delicate operations, such as brain surgery since absorbent cotton elements may loosen or slip off, and may either wholly or partly remain in a surgical opening, especially in brain surgery.

The present invention contemplates an inexpensive absorbent element which is effective in its intended function and is not only very simple in construction but is absolutely safe for both the surgeon and the patient, since its complete bodily removal after use is definitely assured.

The prime object of this invention therefore is the provision of a simple, inexpensive, most effective and safe absorbent element or sponge which is easily handled both for inserting it where needed, as well as in its complete removal after use, thereby minimizing contamination and similar undesired complications.

The foregoing and further objects of the present invention will become more fully evident from the ensuing description in connection with the accompanying drawings, wherein:

FIG. 1 is a perspective view of a neurological sponge constructed in accordance with the present invention;

FIG. 2 is an enlarged top view of a portion of that sponge with a portion of the locking thread removed;

FIG. 3 is an enlarged bottom portion thereof; and

FIG. 4 is a greatly enlarged cross section taken along lines 4—4 of FIG. 2.

In the drawings, numeral 10 denotes an absorbent pad constituting a flat body composed of a plurality of superimposed individual, non-woven layers 11 of mixed absorbent cotton and absorbent rayon fibre 11'. All of the fibres are shown improportionately large in size to more clearly indicate their parallel relation to each other. The rayon fibres mixed with the cotton fibres are intended to prevent the loosening of small cotton particles or lint. The individual absorbent rayon and cotton fibres of each layer are disposed in closely adjacent relation to each other and in a single direction so that the fibres in all layers are substantially parallel to one another. These superimposed non-woven individual layers 11, clearly seen in FIG. 4, are held together by a lock stitch formation composed of thread 12 with the aid of a bobbin thread 12'. That lock-stitching formation is directed transversely to the fibres first in one direction from one edge of the layers towards their opposite edge and then in reverse direction. (See FIG. 1.) The ends of both threads are adapted to extend a substantial distance, say at least nine inches, beyond that one edge of the absorbent layers. It is also preferred that the lock-stitching is relatively coarse, preferably consisting of at least six stitches per inch in each of the two directions, and wherein the two courses of lock stitches are slightly spaced from one another as clearly seen in FIGS. 1, 2 and 3. Both threads employed are preferably of a sturdy construction to withstand any pulling action exerted thereon

when the sponge is to be removed. In fact, either of the threads must be strong enough to prevent breaking, in the event it becomes necessary to sever one of the extending threads and leaving but a single thread for pulling the sponge from a wound after use.

As will be observed from all of the figures in the drawings, the individual absorbent fibres 11' in each individual layer 11 are, as already stated, in parallel relation to one another, and the courses of lock stitches 13 and 14 in opposite directions passing through the superimposed absorbent layers, lock the parallel fibres of each layer against disengagement and raveling so that when the absorbent element is used, the individual fibres will absorb moisture from their outer edges towards the lock stitching, in other words, over substantially their full length, thus effecting a maximum absorbent function of the finished structure. Moreover, since the lock stitching is rather on the coarse type, the absorption of moisture by most of the individual, parallel cotton and rayon fibres takes place even through the lock stitched area, thus effecting a still more complete moisture absorption throughout the entire sponge.

In order to more fully emphasize the importance of the present neurological sponge, it is re-stated that the individual layers forming the sponge are not woven, that they are composed of substantially parallel and intermixed rayon and cotton fibres, and that the thus formed layers are held together by a coarse lock stitching of strong threads.

The intermixing of rayon fibres with cotton fibres prevents cotton particles or lint from loosening and separating from the layers, and that feature of preventing separation of loose absorbent material from the sponge body is an important prerequisite of a safe moisture-absorbent device.

Considering a wound made by a surgical incision, especially in brain surgery, it is essential to quickly and safely remove blood and other fast accumulating fluids, without leaving the slightest traces of foreign matter in the wound. If an absorbent element is used which would allow particles, such as cotton lint, to separate and to remain in the wound after closing an incision in a brain operation, the cerebral spinal fluid can carry such particles to the base of the brain and from there to other parts of the head, and induce fibrosis, that is an abnormal formation of fibrous tissue, or other undesired body and tissue reactions, which must be avoided in surgery, especially in brain surgery, since they may prove fatal.

While it is preferred that the shape of the absorbent element be substantially parallelogrammatic, as shown in FIG. 1, the sponge may be made in any other suitable form, depending upon its intended use, however the application and the function of strong cotton threads for not only locking the fibres in their parallel relation to one another in each of the layers 11, but also to produce secure means for completely and safely removing the absorbent element after use without leaving particles thereof in the wound, is an essential requirement of an absorbent sponge, irrespective of its shape.

The lock stitching connecting the layers 11 is sufficiently secure to retain the parallel fibres in each layer in their intended position, even if the extending end of one of the threads would be cut off, leaving but a single thread still connected with the absorbent element, which single thread must suffice for completely removing the element after use.

It is repeated that the surgical sponge of the present invention, which may be termed a neurological sponge, is formed by superimposing and loosely compacting individual, non-woven absorbent layers composed of individual, parallel, cotton and rayon fibres, the layers being

placed one on top of the other, and are held together by passing through a restricted portion, approximate their central area, of a lock stitched formation of threads, the lock stitching progressing first in one direction from one edge of the layers toward their opposite edge, and then in reverse direction from their opposite edge to that one edge, and permitting the two ends of the threads to extend a substantial distance beyond that one edge of the thus completed absorbent element. While only a single structure of the neurological sponge is illustrated in the drawings, its shape as well as its arrangement, that is to say its dimension and thickness may be altered depending upon the intended use of the sponge. For this reason it is believed that changes required in the form and shape of the sponge structure may be made without departing from the broad idea of a neurological sponge as defined in the annexed claims.

What is claimed as new is:

1. In a neurological sponge structure for surgical uses, the combination with a flat body composed of a plurality of superimposed, individual, non woven layers of absorbent material, such as a mixture of cotton and rayon, and wherein each of the layers is formed of individual, parallelly disposed absorbent fibres arranged in a single direction, and wherein the fibres of all layers are substantially parallel to each other, of a lock stitch thread formation progressing transversely across and substantially at right angles to the parallel fibres of and passing through all of the layers, the lock stitch thread formation progressing first in one direction across the structure and then, as a continuous thread formation, back in opposite direction, but at a slight spacing from the lock stitch thread formation in that one direction, both ends of the thread formation emerging from one edge of the sponge body and extending a substantial distance beyond that one edge thereof.

2. In a neurological sponge structure for surgical uses, the combination with a flat body composed of a plurality of superimposed, individual, non woven layers of absorbent material, such as a mixture of cotton and rayon, and wherein each of the layers is formed of individual, parallelly disposed absorbent fibres arranged in a single direction, and wherein the fibres of all layers are substantially parallel to each other, of a lock stitch thread formation progressing transversely across and substantially at right angles to the parallel fibres of and passing through all of the layers, the lock stitch thread formation progressing first in one direction across the structure to a point substantially at the end of the structure, and then, as a continuous thread formation, back in opposite direction, but at a slight spacing from the lock stitch thread formation in that one direction, both ends of the thread formation emerging from one edge of the sponge body and extending a substantial distance beyond that one edge thereof.

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