

[54] FLAT DRAIN

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[51] Int. Cl. **A61m 27/00**

[58] Field of Search 128/348-351, 128/208

[56] **References Cited**

UNITED STATES PATENTS

2,134,152 10/1938 Schwarzmayr 128/350 R

FOREIGN PATENTS OR APPLICATIONS

105,038 1917 Great Britain 128/350 R

OTHER PUBLICATIONS

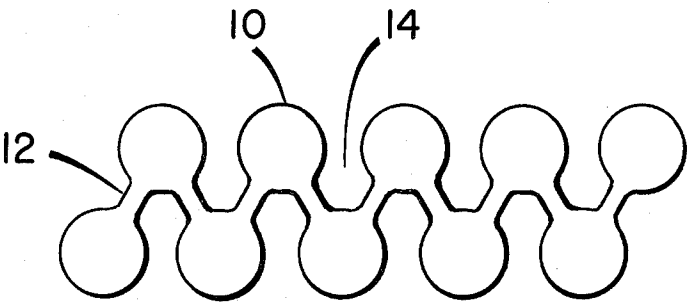
ACMI Catalogue - 1938 - pg. 41.

Primary Examiner—Dalton L. Truluck
Attorney, Agent, or Firm—Gordon Needleman

[57] **ABSTRACT**

This is a drain formed of an elastomeric material having a series of channels spaced from each other, the channels defined by walls comprising a pair of rods connected by a web, the rods lying on two different planes.

4 Claims, 2 Drawing Figures



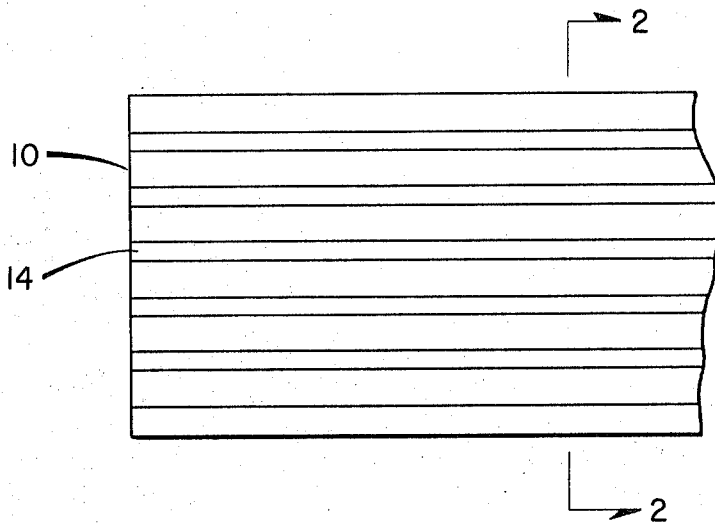


Fig. 1

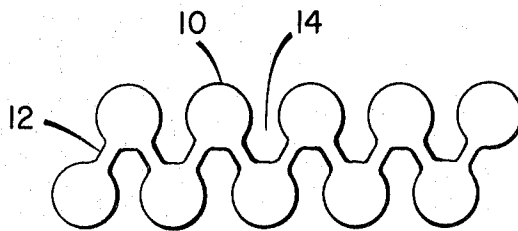


Fig. 2

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FLAT DRAIN

BACKGROUND OF THE INVENTION

Conventionally, surgeons use drains to remove unwanted fluids from a surgical wound. The drain is first installed fairly deeply in the wound or incision and extends outside the animal body in which the wound is located. As the wound heals the drain is pulled out and cut off. It may be left in the wound for an extended period of time and should have the construction that will not cause pain or trauma when the patient moves about. Tubular drains such as the Penrose drain tend to collapse or clog with the debris or coagulant blood destroying their efficacy. Obviously, if a drain is clogged or closed and the necessity for drainage still exists a new drain must be inserted causing discomfort to the patient.

Absorbent dressings such as gauze or a packed Penrose tend for the most part to lose their drainage capacities very quickly in the wound. Plain gauze drains absorb fluids and particulate matter thereby inviting infection, macerating the wound and surrounding tissue while creating the possibility that the drain will adhere to the tissue or might ultimately become hard, nonpliable and thus painful to the patient.

The patent to Schwarzmayer, U.S. Pat. No. 2,134,152 issued Oct. 25, 1938 discloses a strip drain at FIGS. 9 and 10 which includes a series of elongated ribs 13 which are in spaced parallel relation on a base and each pair of which defines a channel 14. Note that the openings in the channel are not constrained and that the ribs are of rectangular configuration.

SUMMARY OF THE INVENTION

This invention is directed to a one piece, flat surgical drain formed of a series of elongated round rods or tubes which are positioned on two planes, are in staggered relation to the rods on the other plane from that on which they lie, are spaced from each other and connected to the adjacent staggered rods by elongated web portions. The set of three adjacent rods including two on the same plane and a rod in staggered relation to them and their connecting webs defines a triangular channel leading the fluids to be drained from the surgical wound or cavity. The web portions extend along the length of the rods on which they are attached. The use of a series of channels avoids the danger of clogging that a drain having a single lumen may encounter. The flat drain cannot collapse as can a tubular drain nor does shrinkage seriously effect its operating capabilities. Varying widths of drains may be easily and quickly provided by tearing longitudinally along a rib. Extremely wide areas may be drained by placing two or more strips side by side. The area of possible infection is reduced in comparison with round drains due to the fact that only a narrower opening is required. If a thicker drain should be needed the strips can be stacked one on top of another or rolled into a circular section.

Of particular importance is the fact that the distance between the spaced rods is less than the distance between the web of the rods preventing larger particulate matter or tissue from entering the channel and clogging or plugging them.

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BRIEF DESCRIPTION OF THE DRAWINGS

Other objects and attendant advantages of the present invention will become obvious to those skilled in the art from a reading of the following detailed description when read in conjunction with the accompanying drawings wherein:

FIG. 1 is a top plane view of the drain.

FIG. 2 is a section taken on a line 2—2 of FIG. 1.

DESCRIPTION OF PREFERRED EMBODIMENTS

There is shown in the drawings a flat strip drain comprising a series of elongated rods 10 which lie on two planes which are in spaced parallel relation to each other. The rods 10 are positioned in two planes which are in spaced relation to each other and the rods on the first plane are in staggered relation to the rods on the second plane. The adjacent rods on different planes are attached to each other by elongated, fairly thin webs 12 which extend along the length of the rods. The combination of two rods on the same plane adjacent to each other and spaced from each other and the staggered rod with which they are attached lying on a different plane and the attachment webs form a somewhat triangular channel which is the drainage channel 14. The distance between the spaced adjacent rods which defines the side walls of the channel is less than the distance of the two webs which partly define the channel thereby defining a constricting opening which will prevent tissue or particulate matter from getting into the channels and clogging them.

The strip drains disclosed are formed of a physiological inert elastomeric material preferably one of the family of silicone rubbers. Under certain circumstances organic rubbers made from butyl polymer or the natural polymer from the hevea tree could be utilized. The silicone rubbers which may be used in this invention can be either of the heat vulcanizing or room temperature vulcanizing type. Since these rubbers are intended for medical purposes fillers, vulcanizing agents and other constituents should be chosen for their non-toxic physiological, inert characteristics. The drains are formed by well known extrusion processes.

That which is claimed is:

1. A surgical drain comprising a series of rods lying on two horizontal planes, the rods of one plane staggered in relation to the rods on the other plane, the rods on the same plane in spaced relation to each other and the rods on the plane connected to adjacent rods on the other plane by a web the drain adapted to be torn along a web on a line substantially parallel to a rod and adjacent rods are in acute angular relation to each other.

2. A surgical drain formed of elastomeric material having a series of spaced channels substantially wedge shaped in cross section defined by walls, each of the walls comprising a first rod portion and a second rod portion connected by a web portion wherein the first rod portion lies on the first plane and the second rod portion lies on a second plane spaced from the first plane and the first rod portion is in staggered relation to the second rod portion.

3. A drain as set forth in claim 2 wherein the distance between the surface of the first rod portion of the one wall and the surface of the rod portion of the other wall is less than the distance between the webs of the walls.

4. A surgical drain as set forth in claim 3 wherein the drain is adapted to be torn along a web on a line substantially parallel to a rod portion and adjacent webs are in acute angular relation to each other.

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 3,860,008

DATED : January 14, 1975

INVENTOR(S) : Kenneth G. Miner, Thomas D. Talcott, James B.
Davidson, David B. Batdorf

It is certified that error appears in the above-identified patent and that said Letters Patent
are hereby corrected as shown below:

Column 2, line 47, the phrase "on the plane" should read
--on one plane--.

Signed and Sealed this

Eighteenth Day of August 1981

[SEAL]

Attest:

Attesting Officer

GERALD J. MOSSINGHOFF

Commissioner of Patents and Trademarks