

FIG. 5.

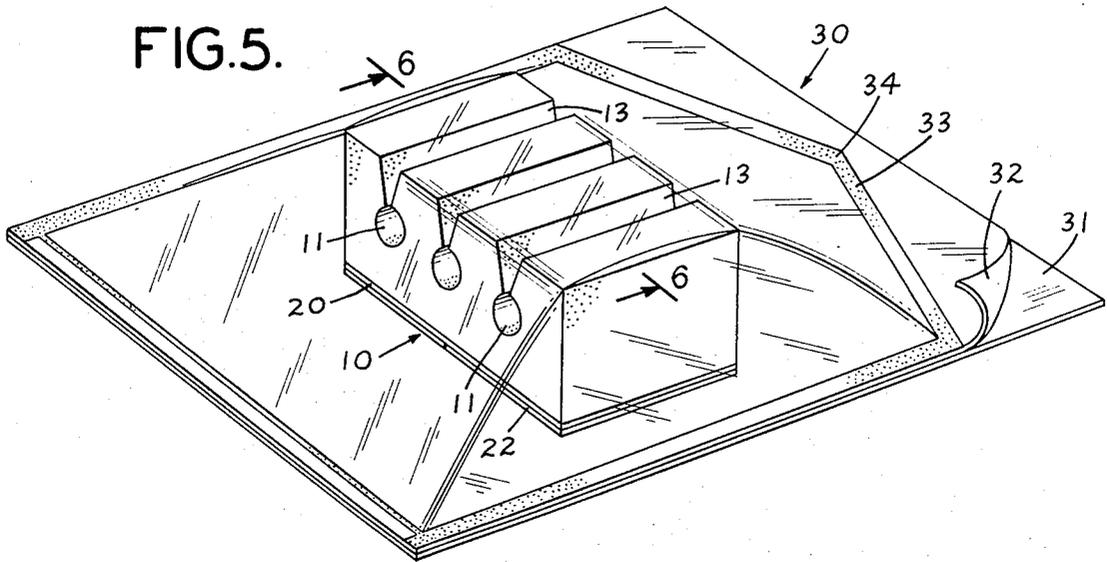


FIG. 6.

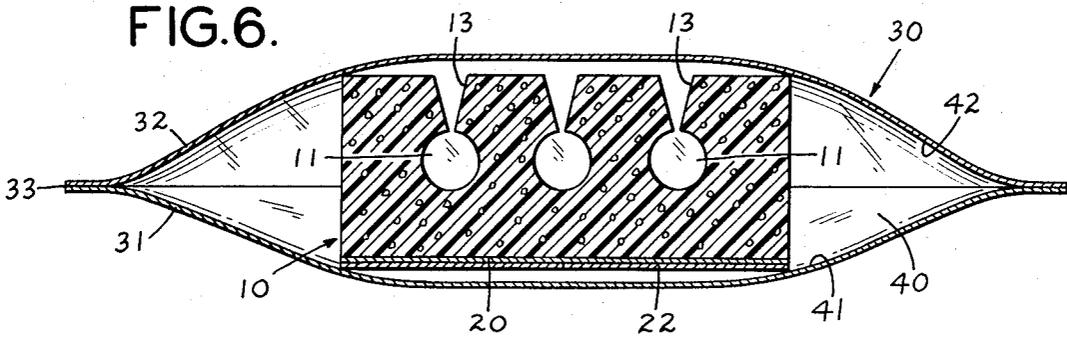
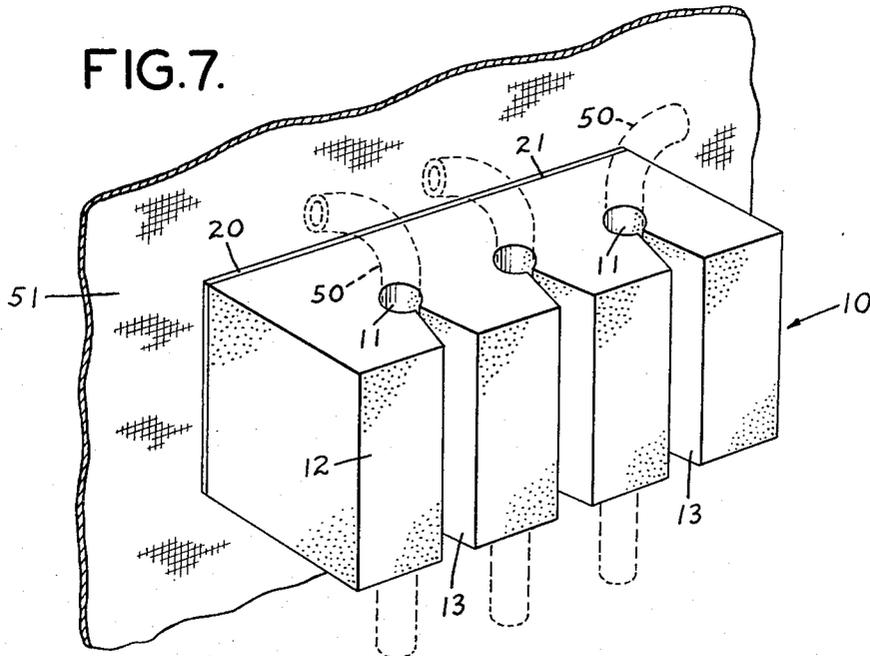


FIG. 7.



**DEVICE FOR ORGANIZING OBJECTS****BACKGROUND OF THE INVENTION**

This invention relates to a device for neatly organizing a variety of objects. More particularly, it relates to a device for use in a surgical operating theatre to organize various surgical instruments and, in particular, the often difficult to handle surgical suction instruments such as suction tubing and various types of suction tips.

During the course of a surgical operation, it is essential to maintain a sterile area surrounding the operative patient. Most of the surgical instruments required in the operation rest upon a Mayo stand within the sterile surgical field. However, certain surgical instruments, have a tendency to continuously fall off, or be knocked off, the Mayo stand and out of the sterile field surrounding the patient. As a result, these instruments become unsterile and can no longer be used unless resterilized. The suction surgical instruments, in particular, suffer from this drawback because they usually comprise tubing which is awkward to handle and which is easily brushed off the Mayo stand into an unsterile area.

It is, therefore, a general object of this invention to provide a device for maintaining objects in an organized configuration.

It is another object of this invention to provide a device for organizing surgical suction instruments in a manner wherein the instruments are firmly retained in an organized configuration and wherein the instruments are conveniently maintained within the sterile field without danger of contact with the unsterile environment surrounding a patient in a medical operating room.

It is another object of this invention to provide a device for organizing medical instruments which can be readily sterilized and which allows quick insertion of the instruments into the device and quick removal therefrom when desired.

These and other objects of this invention will be apparent from a total reading of this specification.

**SUMMARY OF THE INVENTION**

The above objects are fulfilled in accordance with the device of this invention by providing a block of a semi-rigid resilient foam containing therein at least one channel which has a configuration adapted to retain an object therein. A beveled slot provides communication between a surface of the block and the channel. The width of the slot is greatest at the surface of the block and narrows progressively as the slot approaches the channel to provide a relatively thin opening of the slot into the channel. The thin opening has a dimension which is smaller than that of the object which is to be passed through the slot and into the channel.

The object to be organized is inserted, at the surface of the block, into the beveled slot which provides access to the channel. As the object encounters the thin portion of the slot just prior to reaching the channel, the object meets resistance due to the constriction in the slot but is forced through this thin portion of the slot and into the channel by applying a slight pressure to the object which compresses the resisting portion of the foam to cause temporary enlargement of the slot as the object passes through it and into the channel. After

the object has passed through the slot, the resiliency of the semi-rigid foam restores the beveled slot to substantially its original configuration which, in effect, locks the object into the channel since the dimension of the narrow portion of the slot is smaller than that of the object passed through it.

When it becomes desirable to remove the object from the channel, the object is pushed against the narrow portion of the beveled slot to again compress this portion of the slot outwardly in an amount sufficient to permit the object to be dislodged from the channel and pass into the slot and out of the device. After the object has been withdrawn from the device, the resiliency of the semi-rigid foam restores the thin portion of the beveled slot to substantially its original dimension.

The apparatus is also provided with a means for adhesively securing at least one surface of the block to a suitable supporting surface. This supporting surface can take many forms and can include, for example, a portion of the body of the patient undergoing operation or a surgical drape. The block could be affixed to the patient to provide ready access for the surgeon and his staff to the organized instruments or other items contained in the block.

The device of this invention can be readily sterilized in accordance with known procedures. Moreover, it can be conveniently packaged within a strippable envelope, of a variety of types which are well known, with the inner surfaces of the envelope being also sterile. This type of packaging facilitates the presentation to the sterile nurse or other sterile member of the operating team of a sterile instrument organizing device which eliminates the need for independent sterilization of the device before use. The device can similarly be packaged sterile in a variety of known dual envelope strippable medical packages wherein the device is enclosed within a first sealed sterile envelope which in turn is enclosed within a second outer strippable envelope, the inner surfaces of which are sterile. This type of package eliminates any threat of contamination which could arise during the opening of a single envelope package caused by an inadvertent contact of the sterile organizing device with the unsterile outer surface of the envelope.

**BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1 is a perspective view of a preferred embodiment of the organizing device of this invention.

FIG. 2 is a top view of the device of FIG. 1.

FIG. 3 is a sectional view taken along the line 3—3 of FIG. 2.

FIG. 4 is a perspective view of the device of FIG. 1 in 180° rotation and serves to illustrate the adhesive layer on the back of the apparatus.

FIG. 5 is a perspective view of the device of FIG. 1 packaged in a typical single envelope strippable medical product envelope.

FIG. 6 is a sectional view taken along the line 6—6 of FIG. 5.

FIG. 7 is a perspective view showing the device of FIG. 1 in a mounted condition and containing therein a number of organized pieces of surgical suction tubing.

### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS OF THE INVENTION

Referring to FIGS. 1, 2 and 3, it can be seen that the apparatus of this invention comprises a rectangular block 10 of a semi-rigid plastic foam. Block 10 contains therein a plurality of substantially evenly spaced cylindrical channels 11 which extend the entire distance between opposed first and second surfaces of block 10. Communication is provided between a third surface 12 of block 10 and channels 11 by a beveled slot 13. Slot 13 which extends the entire distance between the opposed first and second surfaces of block 10 at which channels 11 terminate contains its widest dimension in proximity to surface 12 and its narrowest dimension in proximity to channels 11, as best seen in FIG. 2.

Channels 11 function to retain the object to be organized therein in an organized configuration. Slots 13 function to provide access of the object from the exterior of the block into channels 11 and, similarly, for egress of the objects from channel 11 to the exterior of block 10 when the objects are needed for use.

As the objects are inserted into slot 13, they initially pass freely through the slot until the dimension of the slot becomes smaller than the dimension of the object. At this point, it becomes necessary to exert pressure on the object to force the object through the narrow portion of the slot and into channels 11 by expanding the narrow portions of the slot to a width which permits passage of the object through them and into channels 11. This expansion is readily accomplished since the foam from which the block is fabricated compresses readily to permit widening of the narrow portion of slot 13 to a degree sufficient to allow the object to pass into channel 11. After the object enters channel 11, the compressed narrow portion of slot 13 resiliently expands to substantially its original dimension to effectively and securely lock the object within channel 11.

To withdraw the object from channel 11 when needed, sufficient force is exerted against the object to cause the narrow portion of slot 13 to expand in an amount sufficient to permit passage of the object from channel 11 through slot 13 to the exterior of block 10. Once the object has passed through this narrow retaining portion of slot 13, the resiliency of the foam restores the slot width to substantially its original thin width.

Block 10 can be fabricated from any suitable semi-rigid foam. The foam, of course, preferably possesses sufficient flexibility and resiliency to permit the narrow portion of slots 13 to be repeatedly opened and closed as objects are moved into and out of receptacle channels 11. Generally, foams having a percent rebound of from about 30 to 40 percent are preferred. A preferred foam is a polyurethane foam such as those available commercially from the American Foam Company and having the following properties:

Density, lbs./cu.ft.	2.0 - 2.6
Water resistance:	
Capillarity:	None
Absorption, % by volume:	Less than 0.5
Water Vapor permeability, perm.in.:	Less than 0.4
Buoyancy, lbs./cu.ft.	55
Resiliency, % rebound:	30 - 35
Tensile strength, p.s.i.:	20 14 30
Thermal conductivity,	
BTU in./hr.ft. <sup>2</sup> °F. at 70°F.:	0.35 - 0.40
Heat resistance °F (unloaded):	
Continuous use:	160

Short exposure:	180
Volume change, heat aging at 140°F. %:	Less than 1
Linear Thermal Coefficient of expansion:	0.000095/°F.
Dielectric constant at 100 cps:	1.05
Dissipation Factor at 10 <sup>9</sup> cps:	0.0002

Other known semi-rigid foam materials having similar properties of resiliency and flexibility can also be employed such as, for example vinyl type foams and foams made from polypropylene and polyethylene. If the organizing device is to be used in a medical application, it is preferable that the foam be non-toxic.

Block 10 is further provided with a means for securing at least one surface of the block to a suitable support surface. Referring to FIGS. 1 through 4, and FIG. 4 in particular, a fourth surface of block 10 which is opposed to the third surface 13 of the block is provided with a strip of a pressure sensitive tape 20 containing adhesive on both sides of the tape. One side of the tape is adhesively secured to surface 21 of block 10. The other side of the tape is covered by a strippable protective layer 22 which is provided in two parts and can be easily peeled away to expose the tacky adhesive side 23 of tape 20. This adhesive side 23 is then emplaced with pressure against a suitable support surface to mount block 10 in any manner desired.

Any of a wide variety of commercially available suitable pressure sensitive adhesives or tapes can be employed. If the block is to be used for medical applications, it is preferable that the adhesive or tape employed be non-toxic. A variety of suitable pressure sensitive tapes are available from the Minnesota Mining & Manufacturing Company, with one suitable tape being designated as 244D. Another suitable tape is a 1 mil thick oriented polypropylene film coated on each side with a permanent pressure-sensitive synthetic rubber based adhesive; such a tape is commercially available from the Fason Industrial Division of Avery Products Corp. under the designation No. 444 Double-Coated Polypropylene Tape.

Block 10 is preferably packaged in a single strippable medical type envelope 30 such as shown in FIG. 5. A number of such envelopes are available commercially and are known to those skilled in the art. In a preferred embodiment, envelope 30 comprises a bottom layer 31 fabricated from a gas permeable paper material and a top layer 32 fabricated from a transparent plastic material such as, for example, Mylar. Block 10 is enclosed between layers 31 and 32 whereupon layers 31 and 32 are heat sealed together to form a cathedral seal 33 having a stress point 34 to facilitate peeling layer 32 from layer 31 when the package is opened.

Block 10 can be sterilized by a variety of known sterilizing procedures. The block is preferably sterilized by exposing it to ethylene oxide gas employing conditions well known to those skilled in the art for affecting sterilization. When block 10 is packaged as in FIG. 5, it becomes convenient to insert the entire package into an ethylene oxide sterilizing oven whereupon the pressurized ethylene oxide vapor permeates the gas permeable paper layer 31 of the package and enters the inner space 40 of the package to contact and sterilize block 10 contained therein. The ethylene oxide vapor also contacts and sterilizes the inner surfaces 41 and 42 of sheets 31 and 32, respectively, to create a totally sterile environment within the interior of the package. Thus, when sheet 32 is peelably stripped from sheet 31, a sterile block 10 will be presented to the user.

Block 10 can also be packaged in any one of a number of known dual envelope strippable medical packages. In such a package, block 10 is enclosed within a first inner envelope which in turn is enclosed within a second outer strippable envelope. Articles packaged in this manner are similarly sterilized using ethylene oxide vapor by insuring that the packaging materials are sufficiently permeable to ethylene oxide vapor to permit penetration of the gas into the interior of both envelopes. Such packages and sterilization techniques are well known to those skilled in the art. The advantages of a dual envelope package is that it eliminates the accidental contamination of the contents which can occur with a single envelope package when the package is opened if the contents should inadvertently contact the often unsterile outer surfaces of the envelope.

The organizing device of this invention can be employed to organize a variety of diverse objects. The configuration of channel 11 and slot 13 will, of course, depend upon the configuration of the objects which are to be organized. The device is particularly useful for organizing surgical suction instruments such as, for example, suction tubing and suction tips including, for example, Yankaur, Poole, Frazier, and Sacks suction tips. The device is also useful for organizing a variety of other surgical instruments such as, for example, cartery instruments. FIG. 7 shows the use of the device to organize a number of flexible pieces of suction tubing 50 which, because their length exceeds that of channels 11, extend beyond the opposed first and second surfaces of block 10 at which channels 11 terminate. In FIG. 7, block 10 is securely affixed to a suitable supporting surface 51 such as, for example, a surgical drape by means of pressure sensitive adhesive tape 20. Thus, in its operable position, it is seen that the first and second surfaces of block 10, at which channels 11 terminate, are exposed and that channels 11 and slots 13 extend the entire distance between these first and second surfaces and are open at each end thereof.

The specific embodiments of the device of this invention presented hereinabove are illustrative only and such modifications and alterations therein as would be suggested to one skilled in the art are deemed to fall within the scope and spirit of the claims appended hereto.

I claim:

1. A device comprising: a semi-rigid foam:
  - i. at least one channel extending the entire distance between opposed first and second surfaces of the foam, said first and second surfaces being exposed when the device is in its operable position, the channel having a configuration adapted to retain an object therein and being open at each end thereof when the device is in its operable position so as to permit an object retained therein whose length exceeds that of the channel to extend beyond the first and second foam surfaces;
  - ii. a beveled slot providing communication between a third surface of the block and the channel, the slot extending the entire distance between the first and second surfaces of the foam, and being open at each end thereof when the device is in its operable position, the width of the slot being greatest at the third surface of the foam, and narrowest at its entrance into the channel, the slot being sufficiently

narrow at its entrance to the channel to securely retain the object within the channel; and

- iii. means for rendering a fourth surface of the foam adhesive for adhesively securing the fourth surface of the foam to a supporting surface, whereby said device is placed in its operable position.

2. The device of claim 1 wherein said device is sterile.

3. The device of claim 2 wherein said sterile device is sealed within a strippable envelope, the inner surfaces of which are sterile.

4. The device of claim 3 wherein said strippable envelope comprises a first layer of a transparent plastic material and, sealed to said first layer, a second layer of a gas permeable paper.

5. The device of claim 1 wherein said foam has a percent rebound of from about 30 to 40 percent.

6. The device of claim 1 wherein said foam comprises a polyurethane.

7. The device of claim 6 wherein said polyurethane foam has a density of 2.0 to 2.6 pounds per cubic feet and a resiliency, expressed as percent rebound, of 30 to 35 percent.

8. A device for organizing objects comprising: a block of semi-rigid foam, said block containing:

- i. a plurality of separate cylindrical channels, each of said channels extending the entire distance between opposed first and second surfaces of the block, said first and second surfaces being exposed when the device is in its operable condition, each of said channels being open at each end thereof when the device is in its operable position so as to permit objects retained therein whose length exceeds that of the channel to extend beyond the first and second block surfaces;
- ii. a plurality of beveled slots providing communication between a third surface of the block and the channels, each slot extending the entire distance between the first and second surfaces of the block and being open at each end thereof when the device is in its operable position, the width of each of the slots being greatest at the third surface of the block, and narrowest at its entrance into the channel, the slots being sufficiently narrow at their entrance to the channel to securely retain the object within the channel; and

- iii. means for rendering adhesive a fourth surface of the block which is opposed to the third surface of the block for adhesively securing the fourth surface of the block to a supporting surface, whereby said device is placed in its operable position.

9. The device of claim 8 wherein said device is sterile.

10. The device of claim 9 wherein said device is sealed within a strippable envelope, the inner surfaces of said envelope being sterile.

11. The device of claim 10 wherein said strippable envelope comprises a first layer of a transparent plastic material and a second layer of a gas permeable paper, said layers sealed together with a cathedral type seal.

12. The device of claim 8 wherein said foam has a percent rebound of from about 30 to 40 percent.

13. The device of claim 8 wherein said foam comprises a polyurethane.

14. The device of claim 13 wherein said polyurethane foam has a density of 2.0 to 2.6 pounds per cubic feet and a resiliency, expressed in percent rebound, of 30 to 35 percent.

\* \* \* \* \*

5

10

15

20

25

30

35

40

45

50

55

60

65

UNITED STATES PATENT OFFICE  
CERTIFICATE OF CORRECTION

Patent No. 3,696,920 Dated October 10, 1972

Inventor(s) Charles A. Labay

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

- Column 3, line 64, "20 14 30" should be -- 20-30 --;
- Column 5, line 49, after "foam" insert -- containing --;
- Column 5, line 61, "shot" should be -- slot --;
- Column 6, line 40, "shot" should be -- slot --.

Signed and sealed this 1st day of May 1973.

(SEAL)  
Attest:

EDWARD M. FLETCHER, JR.  
Attesting Officer

ROBERT GOTTSCHALK  
Commissioner of Patents