

United States Patent

Penniman et al.

[15] 3,696,916

[45] Oct. 10, 1972

- [54] **THERMOMETER SET**
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- [73] Assignee: **Sherwood Medical Industries Inc.**, St. Louis, Mo.
- [22] Filed: **Aug. 4, 1969**
- [21] Appl. No.: **847,318**
- [52] U.S. Cl.**206/16.6, 248/148, 248/204, 248/311**
- [51] Int. Cl.**B05d 85/20**
- [58] Field of Search...220/5 A, 5, 43; 206/16.6, 16.5; 248/105

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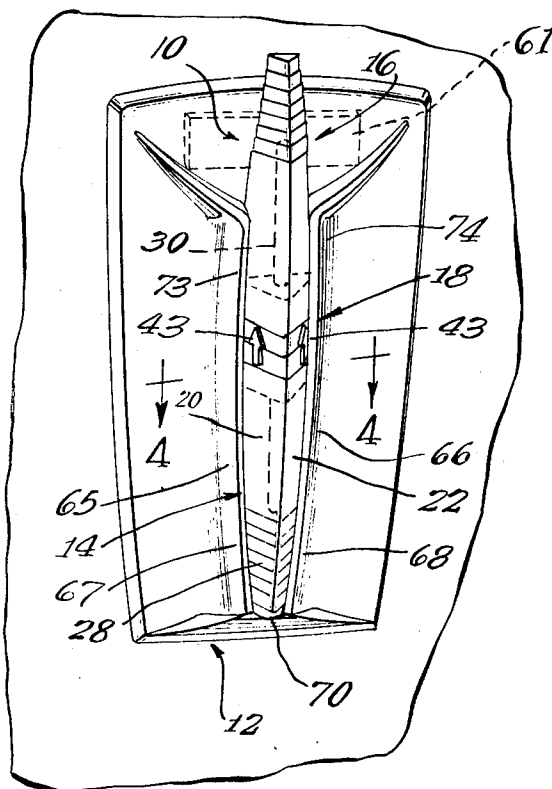
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[57] ABSTRACT

A thermometer container and holder assembly of plastic construction adapted to be placed at the patient's bedside wherein the thermometer container consists of a tapered three-sided base which receives a push-on stopper at the upper end thereof and a cover also receivable on the stopper of identical construction to the base, there being provided a wall or table mounted support for the container that resiliently grasps the container with sufficient force so that if desired the container cover may be removed without the removal of the entire container from the support.

7 Claims, 10 Drawing Figures



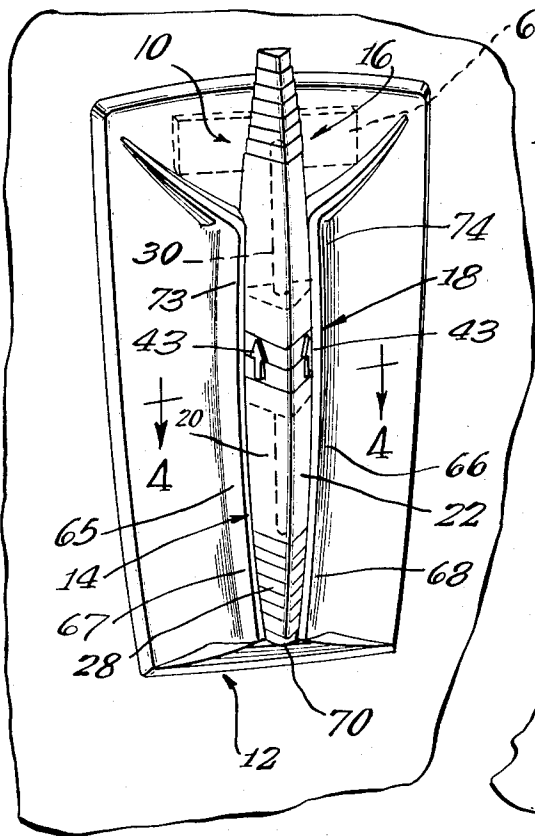


Fig. 1

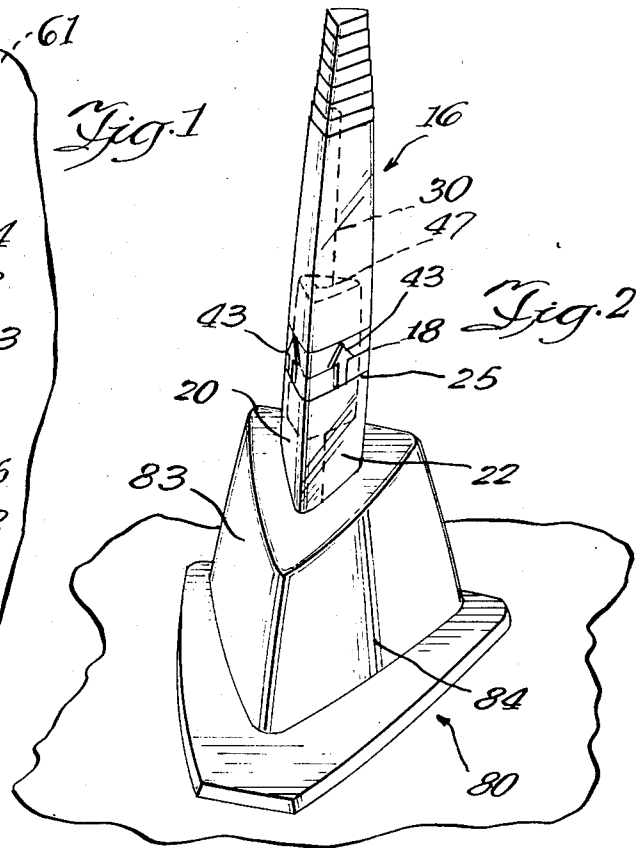


Fig. 2

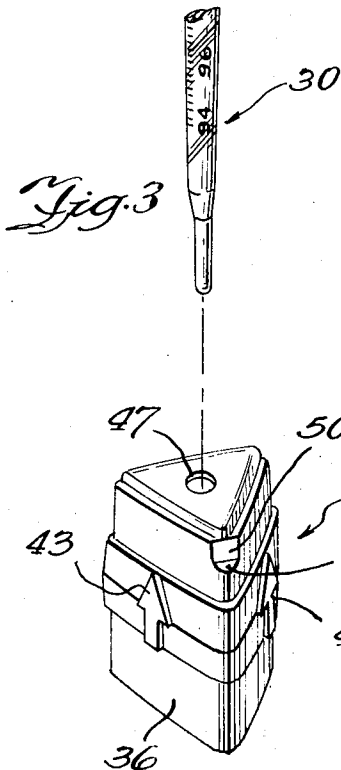


Fig. 3

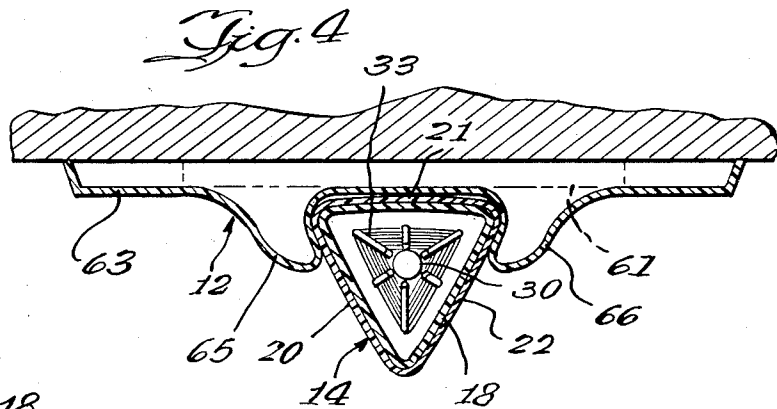


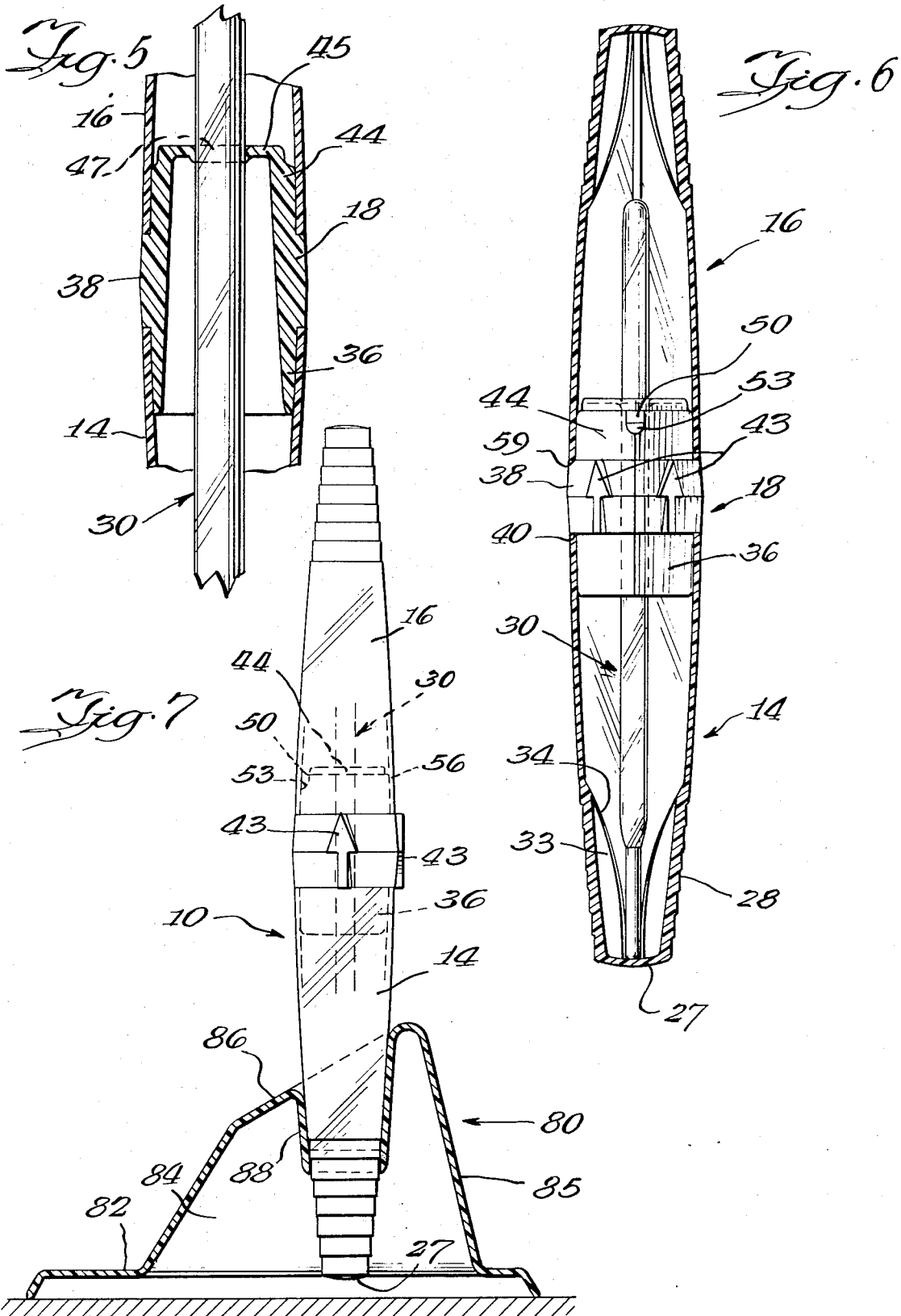
Fig. 4

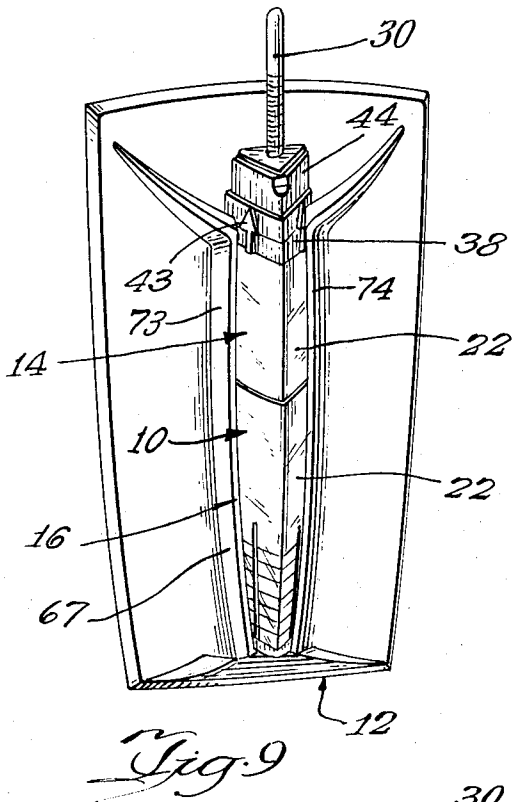
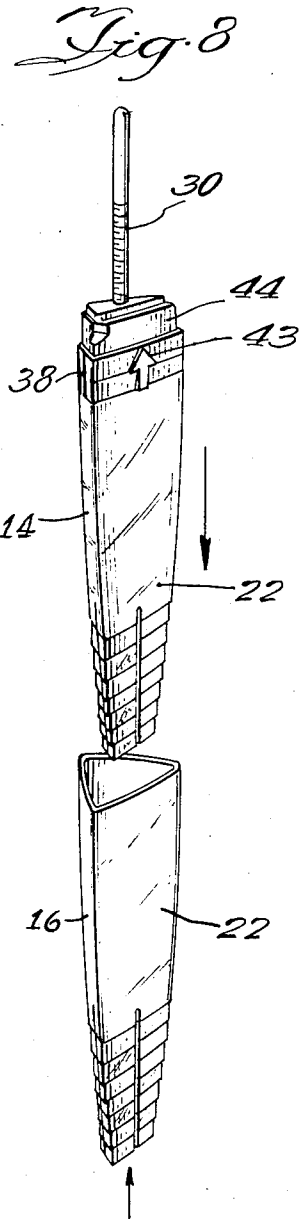
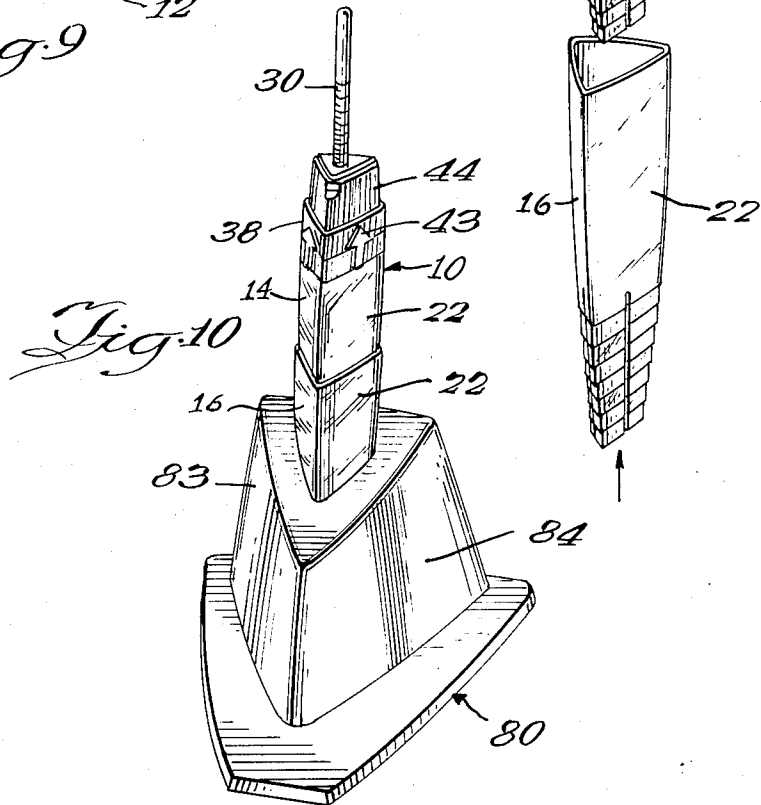
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THERMOMETER SET

BACKGROUND OF THE PRESENT INVENTION

This invention relates generally to containers for thermometers in hospital use and more particularly to a container and a support for maintaining the container in an upright position near the patient's bedside.

In the past it has been conventional in recording the temperatures of patients periodically to utilize a cart with a plurality of thermometers each disposed in an individual alcohol container, open at the top. After taking the cart to the patient's room and using one of the thermometers to take the patient's temperature, the thermometer is returned to the cart to another separate container. After each use the thermometers are washed and sterilized.

There are many disadvantages in this established procedure for recording patients' temperatures. The primary disadvantage is that the commingling of thermometers from different patients on the cart and during sterilization and washing increases significantly the likelihood of a communicable disease bacterial transfer between patients, such as the staphylococcus bacteria which, as is well known, is readily communicable in the hospital environment.

Therefore, it has become desirable to find an alternative procedure and one finding significant popularity today is the provision of a device which permits the patient's thermometer to be placed and maintained near the patient's bedside and used repeatedly by the same patient without sterilization after each use. A liquid chemical in the individual thermometer containers is sufficient to inhibit bacterial growth even though the thermometer may be utilized repeatedly.

A significant clinical advantage is realized through the use of one thermometer with each patient. Thermometers manufactured to commercial standards can have 0.4° variation from thermometer to thermometer below a temperature of 102° F. and 0.6° variation above 102° F. There is medical significance in a patient's temperature change which can be more reliably detected with a single thermometer than with a number of thermometers with inherent sensing inaccuracies. Detection of temperature changes and trends is more desirable than actual temperature readings.

It is, therefore, a primary object of the present invention to provide a more efficient and significant temperature measuring system and an improved and simplified thermometer container and a support for holding the container in an upright position near the patient's bedside, such as on a table or on a wall near the bed.

SUMMARY OF THE PRESENT INVENTION

In accordance with the present invention a bedside thermometer container and support is provided which facilitates the use of the thermometer, inhibits bacterial growth, and which may be easily disassembled for sterilization and washing. The thermometer container itself includes a triangularly shaped elongated base that receives a triangularly shaped stopper with an aperture for receiving the thermometer. The stopper also receives a cover for closing the projecting end of the thermometer and the aperture. This cover is of identical construction to the base reducing the cost of manufacture of the container as well as permitting in-

terchangeability during use between bases and covers in the hospital. The cover nests over the base and can be inserted in either holder in this position. This permits maintaining the thermometer in a position for quick removal from the case and prevents misplacing the cover during the time the unit is maintained with the cover removed.

The stopper is shaped so that it has a somewhat tighter fit on the base than it does on the cover so that when the cover is pulled from the stopper, the stopper will not be withdrawn from the base.

There are two holders disclosed herein for supporting the thermometer container; one adapted to be mounted on a wall adjacent the patient's bed, and the other adapted to rest on a table in the patient's room. Both of these holders or thermometer container supports resiliently grasp the base of the container with sufficient force so that if desired, the container cover may be removed exposing the thermometer without removing the entire container from the holder.

The container is removed from the holder and the cover placed over the thermometer and stopper and given to the patient to take home when he leaves the hospital or can be thrown away so as to avoid cross-contamination with a subsequent patient.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the present thermometer container shown in its position within the wall mountable holder with the cover in closed position;

FIG. 2 is a perspective view of the present thermometer container shown in a table holder according to another embodiment of the present invention with the cover in closed position;

FIG. 3 is a perspective view of the container stopper;

FIG. 4 is an enlarged cross-section taken generally along 4-4 of FIG. 1;

FIG. 5 is a cross-section of the stopper illustrated in FIG. 3;

FIG. 6 is a cross-section of the container assembly;

FIG. 7 is a partial section of the present container assembly inserted within the holder shown in the embodiment of FIG. 2;

FIG. 8 is a perspective view of the top half of the container positioned in nested relationship to the bottom half of the container;

FIG. 9 is a perspective view of the nested container of FIG. 8 in position in the wall mountable holder; and

FIG. 10 is a perspective view of the nested container of FIG. 8 in position in the table holder.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings and particularly FIGS. 1, 3, 4, 5, 6, 8 and 9, a thermometer container 10 is illustrated seated within a holder or support 12.

The container 10 includes a base 14, a cover 16, and stopper 18. The base 14 and the cover 16 are of identical construction so that the following description with reference to one should be understood to apply equally to both of these parts. This identical construction of the cover and base permits not only a simplification in the manufacture of the container 10 but also enables the supplier and the user, i.e. the hospital, to interchange these elements as desired.

Base 14 is triangular in cross-section having slightly convex side walls 20, 21 and 22 as seen clearly in FIG. 4. The walls 20, 21 and 22 define an open upper end 25 of the base, and converge downwardly from the open upper end 25 to a triangularly shaped bottom wall 27. The closed end portion 28 of the base 14 is shown stepped, however, this configuration could be changed and, except for the converging nature of the closed end portion, is not part of the invention. As will appear hereinafter, the tapered configuration of the base 14 assists in locating thermometer 30 with respect to the bottom of the base 14, provides an improved locking action with the stopper 18, assists in providing a wedging action with the holder 12 and is shaped to permit nesting of the cover 16 over its closed end portion 28.

For the purpose of centering the thermometer 30 with respect to the bottom wall 27 of the base 14, a plurality of longitudinally extending projections 33 are defined in the inside of the closed end or bottom portion 28 of the base 14. These projections have curved upper surfaces 34 that guide the end of the thermometer into position as shown in FIG. 6. As seen more clearly in FIG. 4, there are six of the projections 33 provided within the bottom of the base 14. These projections 33 also protect the thermometer from breakage during shipping and handling.

The base 14 and the cover 16 may be constructed of a fairly rigid transparent plastic such as clear polypropylene.

The upper portion or opening 25 of base 14 receives a triangular projection 36 extending downwardly from a triangular central section 38 of stopper 18. A shoulder 40 limits the amount of insertion of the stopper 18 into the base. The projection 36 has a close fit with the inside of the upper end of base 14 but may be removed therefrom by grasping the central portion 18 and pulling the stopper with respect to the base. The taper on the base 14 provides an increasingly tight fit for the stopper as the stopper projection 36 is inserted within the base. The stopper 18 may be constructed of a plastic such as polyethylene.

Indicating arrows 43 are provided on the central portion 38 of the stopper to be certain that the stopper is assembled with the projection 36 extending within the base 14 and not the cover 16. While the base 14 and cover 16 are identical, one must be selected as the base and filled with antiseptic liquid, and since the stopper 18 is not axially symmetrical its orientation is of significance.

Projecting upwardly from the central portion 38 is an upper projection 44 also of triangular cross-section. A top wall 45 extends across projection 44, integrally therewith, and has an aperture 47 which permits the insertion of thermometer 30 into the container 10. The fit between the thermometer 30 and the walls of the aperture 47 is such that a seal therebetween is provided (See FIG. 5) so as to prevent evaporation of the liquid in base 14 and to prevent spilling of said liquid in the event the container 10 is upset. The seal also acts as a wiper to wipe off surplus liquid adhering to the outside of the thermometer as it is removed from the stopper 18. The outer cross-sectional dimensions of the projection 44 are slightly less than the outer cross-sectional dimensions of the lower projection 36. The purpose of

this is to provide a somewhat tighter fit between stopper 18 and the base 14 than is provided between the stopper 18 and the cover 16, noting that base 14 and cover 16 are dimensionally the same. In this manner when it is desired to open the container 10 the nurse need only grasp the cover 16 and pull it from the base 14 and the cover 16 will be removed from the stopper 18 without separation of the base 14 from the stopper 18. In this manner it is not necessary for the nurse to grasp the stopper portion 38 when removing the cover to prevent separation of the base 14.

To facilitate the placement of the cover over projection 44 an axially reduced land portion 50 is provided on projection 44 at the intersection of two of the walls defining the projection. The reduced portion 50 intersects an outwardly tapering surface 53 as seen clearly in FIGS. 3, 6 and 7. The tapered surface 53 acts to urge the opposite wall of the cover 16 against the complementary wall of projection 44 as shown at 56 in FIG. 7 and in this manner facilitates replacement of the cover 16 on the container 10. The junction of the projection 44 with the central portion 38 defines a shoulder 59 which limits the insertion of the projection 44 into the cover 16.

As seen in FIGS. 1 and 4 the holder 12 is seen to be constructed of a relatively thin plastic, such as a vacuum formed styrene. The holder 12 may be provided with conventional foam tape 61 on the backside thereof for the purpose of fixing the holder to a wall in the patient's room. The holder 12 is seen to have a rectangular generally planar base portion 63 and two elongated generally parallel vertical walls 65 and 66 projecting therefrom. The walls 65 and 66 taper and converge at their lower portions 67 and 68 to limit downward movement of the thermometer container 10 and complement the shape of base 14. Moreover, a bottom wall 70 interconnects the lower ends of side walls 65 and 66 assisting in limiting downward movement of the container 10 in the support 12. The upper portion of walls 65 and 66, as indicated at 73 and 74 in FIG. 1, converge inwardly somewhat in a direction opposite the lower portions 67 and 68 and provide a grasping function since the distance between the inside of the walls in this upper area is less than the outside of the adjacent portions of the cover 16 when the container 10 is in the position shown in FIG. 1. Since the container 10 is wider adjacent the stopper 18 than it is in the area adjacent the upper wall portions 73 and 74, the converging portions 73 and 74 will exert a greater grasping force on the container 10 as it is moved upwardly from its position shown in FIG. 1. The walls 73 and 74 are positioned close enough together so that they exert a sufficient force on the periphery of the stopper 18 and the upper portion of the base 14 so that the cover 16 may be removed from the container without the removal of the entire container from the support 12.

An alternative support 80 is illustrated in FIGS. 2, 7 and 10. This support is adapted to rest on a table in the patient's room and may also be constructed as a vacuum formed styrene plastic. Holder 80 is seen to consist generally of a base portion 82 from which extends upwardly projecting walls 83, 84 and 85. Formed integrally with these walls is an angularly related upper wall 86 which has downwardly extending inwardly con-

verging walls 88 which are congruent with the outer surface of the base 14. Walls 88 are somewhat flexible, i.e. more flexible than the walls of container base 14, and permit a wedging action with the base 14 as the container 10 is inserted therein. The walls 88 are sized such that with a sufficient downward force on the container 10, the walls will grasp the base 14 with sufficient force so that the cover 16 may be removed from the container without the removal of the entire container 10 from the base 80.

As shown in FIGS. 8, 9 and 10, the cover 16 can be removed from the stopper 18 and inverted and nested over the closed bottom end portion 28 of the base 14. The nested base 14 and cover 16 are then slid into the holder 12 as shown in FIG. 9 with the combined depth of the base 14 and cover 16 raising the stopper 18 and thermometer 30 to a readily accessible point above to top surface of the sides 73, 74 of the holder. In like manner, the container 10 with the cover 16 nested over the base 14 can be inserted into the opening in holder 80 as shown in FIG. 10. The nesting of the cover 16 over the base 14 and assembly with the holder provides a means for storing the cover 16 against being lost or misplaced and as a practical matter the hospitals prefer to have the upper part of the thermometer exposed for ready use in a patient's room as is accomplished by the form of storage of the cover 16 as shown in FIGS. 8, 9 and 10. The cover 16 is designed to grip the outside of the base 14 with sufficient force that holding the cover 16 and pulling the thermometer will permit the thermometer to be withdrawn from the container without unnesting the cover 16 from the base 14 or the stopper 18 from the base 14. Likewise, the cover 16 when nested on the base 14 and inserted in the holder 12 or 80 will be gripped by the holder and will grip the base with sufficient force that the container will not be separated from the holder as the thermometer is removed from the stopper 18 for use.

A supplier will ship holders 12 and 80 together with containers 10 including a sterile thermometer 30, stopper 18, cover 16 and base 14. An attendant will select a container 10, remove the base 14 and fill it with antiseptic liquid and reassemble it with the stopper 18 with the thermometer end in the liquid. The cover 16 is removed and nested over the base 14 and the nested container is slipped in the appropriate holder 12 or 80 and placed in the patient's room. When the patient has recovered, the container 10 is removed from the holder, the cover 16 is unnested from base 14 and is telescoped over the thermometer and upper end of the stopper 18. The container is then given to the patient to take home or it is disposed of.

In clinical use, it has been found that a patient's change in temperature from reading to reading is quite indicative of certain conditions. Using prior systems of having a different thermometer each time a reading is taken it was possible to have as much as a degree difference from one thermometer to the next which only helped to confuse the diagnosis and complicate the treatment. By using a system as taught herein, a single thermometer is used continuously so that each reading can be accurately compared with previous ones. Thereby adding to the accuracy and effectiveness of the subsequent treatment and cure.

What is claimed is:

1. A thermometer support assembly, comprising: elongated container means adapted to hold a thermometer in an upright position partially submerged in a liquid chemical, said container means having an upper closure portion with an opening for receiving the thermometer, a cover for said opening, receiving means on said container means for receiving and holding said cover, said receiving means being sized so that a predetermined force is required for opening said cover, a support for said container means for supporting the container means in an upright position, interengaging means on said container means and said support means, said interengaging means including tapered axially extending wall means on the container and tapered axially extending wall means on the support so that the support wall means is forced apart upon insertion of the container, said interengaging means being constructed to require a predetermined force for removal of said container means from said support, said first predetermined force being less than said second predetermined force whereby the cover may be opened without removing the container means from the support.

2. A thermometer support assembly as defined in claim 1, wherein said support has an opening with flexible side walls for receiving said container means, said container means having a portion spaced from the lower end thereof of greater width than the width of at least a portion of said opening walls, whereby the walls will grasp the container means when inserted therein.

3. A thermometer support assembly as defined in claim 2, wherein said opening walls are generally congruent in section with the interengaging portion of the container means.

4. A thermometer support assembly as defined in claim 2, wherein said opening in the support is open horizontally in the front and defined by two vertical generally parallel spaced walls, said walls converging toward one another at their free ends to partly surround the container means, said walls being spaced closer together at the upper portions thereof than said greater width portion of the container means whereby the container means is held by said support.

5. A thermometer container and support assembly, comprising: an elongated polygonal base having an upper open end, said base converging from the upper open end, a polygonal stopper having a polygonal projection secured in said upper open end of the base, said stopper having an opening therethrough for receiving a thermometer, said stopper having an upwardly extending polygonal projection smaller in section than said lower polygonal projection, an elongated polygonal cover having an open lower end secured on the stopper upper projection, said cover tapering upwardly from said open end, a support for said base, stopper, and cover including a wall mountable portion, a pair of spaced generally vertically disposed free walls extending from said wall portion, said walls converging toward one another adjacent their free ends to provide a recess for receiving the base, said walls being sufficiently close together at their upper ends to hold the base and prevent base separation from the support during removal of the cover.

6. A thermometer container and support assembly, comprising: an elongated polygonal base having an upper open end, said base converging from the upper

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open end, a polygonal stopper having a polygonal projection secured in said upper open end of the base, said stopper having an opening therethrough for receiving a thermometer, said stopper having an upwardly extending polygonal projection smaller in section than said lower polygonal projection, an elongated polygonal cover having an open lower end secured on the stopper upper projection, said cover tapering upwardly from said open end, a table support for said base, stopper and cover including a support portion engageable with a horizontal surface, said support having an upwardly extending portion with an upper wall, and downwardly extending converging walls in said upper wall defining a receiver for said base, said downwardly converging walls grasping said base with sufficient force to prevent removal of the base from the support when the cover is removed from the stopper.

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7. A container for a thermometer comprising an elongated base having a tapered lower end portion and having an open upper end, a stopper for said open end, said stopper having an opening therethrough for receiving the thermometer, and a cover receivable on said stopper for enclosing the top of said thermometer, said cover being identical in configuration to said elongate base and being adapted to nest over said lower end portion when said cover is removed from said stopper, a support having an opening with flexible side walls for receiving said nested cover and base, said side walls grasping the outside of the cover when inserted in said opening with sufficient force that the thermometer can be removed from said stopper without separating said container from said support.

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