

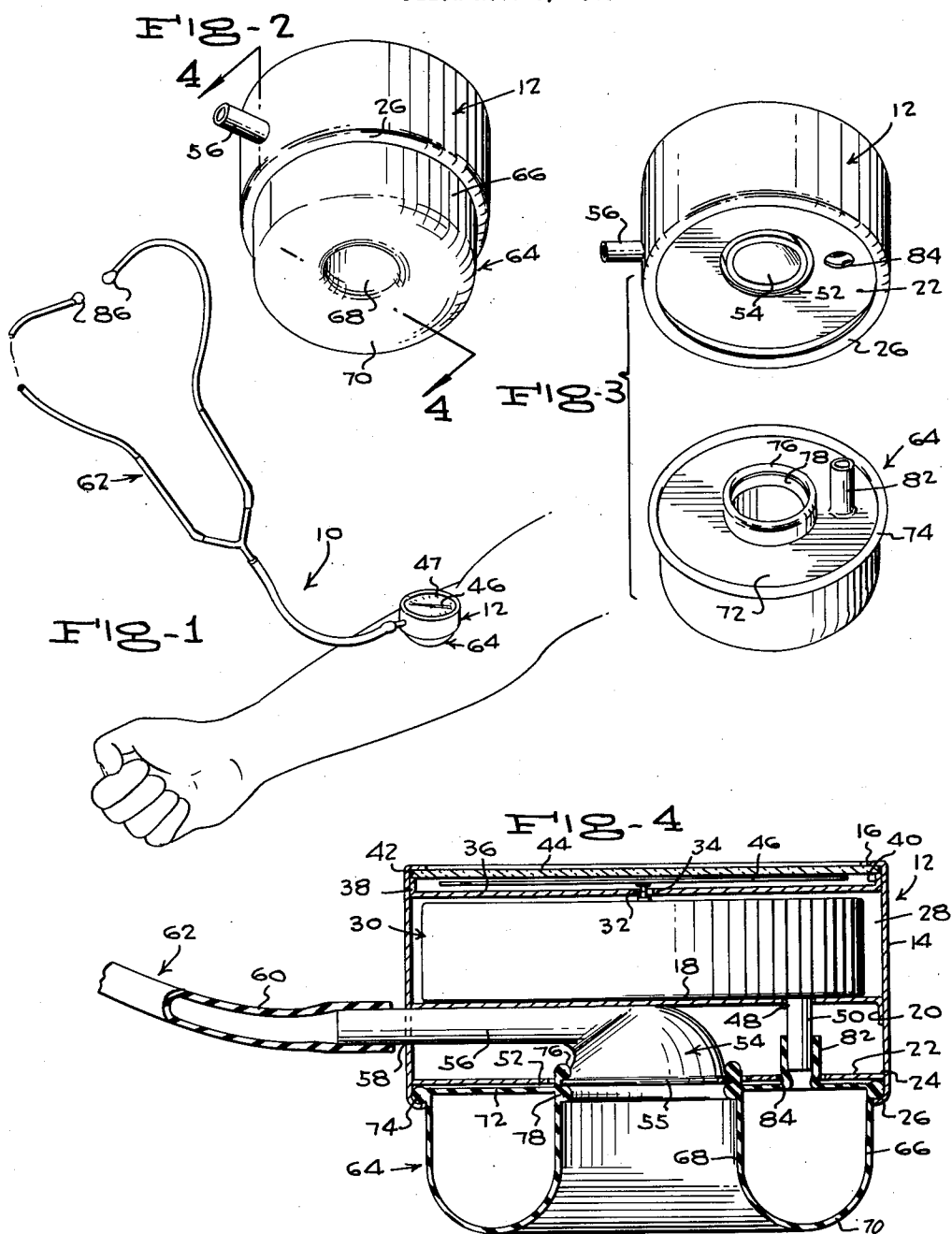
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SPHYGMOMANOMETER

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3,032,030

## SPHYGMOMANOMETER

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7 Claims. (Cl. 128—2.05)

This invention relates to an improved measuring sphygmomanometer for taking blood pressures.

The primary object of the invention is to provide a more compact, cheaper, and more effective, efficient and easily used device of the kind indicated, combined with a stethoscope, which involves a compressible applicator element in communication with a measuring manometer having a connection for a stethoscope.

Another object of the invention is to provide a device of the character indicated above whose use eliminates the various and plural procedures normally required for taking blood pressures with stethoscopes and manometers, and requires instead only pressure application to an artery area of the compressible applicator element.

A further object of the invention is to provide a device of the character indicated above which is composed of a small number of simple and easily assembled parts, and wherein the compressible element is quickly and easily removed for sterilization or replacement, and is easily put back into place.

Other important objects and advantageous features of the invention will be apparent from the following description and the accompanying drawing, wherein, for purposes of illustration only, a specific form of the invention is set forth in detail.

In the drawings:

FIGURE 1 is a schematic perspective view showing a device of the invention in use to take blood pressure from an arm artery;

FIGURE 2 is an enlarged bottom perspective view of the device, with the stethoscope removed;

FIGURE 3 is an exploded perspective view showing the applicator element removed from the body of the device; and,

FIGURE 4 is an enlarged vertical transverse section taken on the line 4—4 of FIGURE 2.

Referring in detail to the drawings, wherein like numerals designate like parts throughout the several views, the illustrated device, generally designated 10, comprises a rigid, light-weight sheet metal casing 12, of flat cylindrical form, having a side wall 14 on whose upper end is an internal annular retaining flange 16. Spaced downwardly from the flange 16 and upwardly from the lower end of the side wall 14, is a horizontal partition wall or plate 18 which is suitably fixed around its edge, as indicated at 20, to the side wall 14. Spaced below the partition wall 18, and located adjacent to the lower end of the side wall 14, a bottom plate 22 extends across the casing 12 and is suitably fixed at its edge, as indicated at 24, to the side wall 14. The side wall 14 has on its lower end and closely spaced below and facing the bottom plate 22, an internal annular assembling flange 26, preferably of arcuate cross-section.

Located in the chamber 28 defined in the casing 12 above the partition plate 18 is a flat cylindrical measuring manometer 30 which rests upon the partition plate 18 and has an upstanding pointer shaft 32 which extends upwardly through an accommodating hole 34 provided in a retaining disc 36. The retaining disc 36 has suitable frictional engagement at its edge with the casing side wall 14, as indicated at 38, for holding the disc 36 and the manometer 30 down in place. The manometer 30 is suitably one similar to the available "Tycos" manometer. The securing means 38 can be in the form of an upstanding annular

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flange 40 on the disc 36 whose free upper edge 42 is engaged with the underside of a glass 44 which spacedly overlies and exposes to view a hand or pointer 46 on the shaft 32, with reference to a pressure scale 47, the glass 44 being held in place by the retaining flange 16.

The partition plate 18 is provided with an eccentric hole 48 to pass the downwardly directed nipple 50 on the manometer 30. The bottom plate 22 is provided with a central circular opening 52 which is somewhat larger in diameter than a rigid stethoscope bell 54, whose larger open end, surrounded by an external bead 55, faces downwardly and is registered with the opening 52. The rigid lateral tube 56 on the bell 54 extends radially therefrom and out of the casing through an opening 58 provided in the casing side wall 14, immediately beneath the partition plate 18, against which the bell 54 and the tube 56 bear. The flexible tube 60 of a conventional stethoscope 62 is removably engaged on the outer end of the bell tube 56, as shown in FIGURES 1 and 4.

The illustrated device further comprises a flat annular doughnut-shaped compressible applicator in the form of an air sack or bladder 64 having parallel vertical outer and inner side walls 66 and 68, respectively, which are joined and spanned at their lower ends by an arcuate bottom wall 70. The walls 66, 68 and 70 are flexible and resilient, and have limited stretchability. The sack 64 further comprises a flat annular top wall 72 which is joined to and spans the space between the upper ends of the side walls 66 and 68. An enlarged cross-section rigid external attaching bead 74, preferably of cylindrical cross-section, which is formed at the junction of the upper edge of the outer side wall 66 with the top wall 72, and which is dimensioned and located to be snapped into and out of engagement behind or above the assembling flange 26, and engaged with the underside of the bottom plate 22, and the inner side of the casing side wall 14, in a manner to assemble the sack 64 to the lower end of the casing 12, with its top wall 72 close to and tensioned toward the underside of the bottom plate 22, as illustrated in FIGURE 4.

Rigidifying the sack top wall 72 and providing retaining or assembling means for the stethoscope bell 54, is a pair of vertically spaced internal upper and lower beads 76 and 78, respectively. The lower bead 78 is formed at the upper end of the inner side wall 68, while the upper bead 76 is formed on the lower bead 78 and rises through the opening 52 of the bottom plate 22. The sack 64 is structurally and operatively connected in communication with the bell 54 by securably and removably engaging the upper internal bead 76 over the external bead 55 on the bell 54, with the lower internal bead 76 engaged with the underside of the bell bead 55, as shown.

In vertical alignment with the manometer nipple 50, the top wall 72 of the air sack 64 has an upstanding resilient nipple 82, which rises through a hole 84 provided in the bottom plate 22 and is removably engaged on the manometer nipple 50.

In use and operation of the device 10, by the use of only one hand of the operator, the applicator air sack 64 is placed on the arterial area from which a blood pressure reading is to be taken and held in situ with the desired degree of pressure, as read on the scale 47, while the tips 86 of the stethoscope 62 are engaged in the ears of the operator of the device 10. The opening of the sack 64 is centered over the properly chosen arterial area, so that the indirecting sounds are funnelled through the center of the sack 64, directly to the stethoscope bell 54, and transmitted efficiently and without loss to the stethoscope 62, at the same time that changing positions of the manometer pointer 46, relative to the scale 47, are readily seen through the upwardly facing glass 44.

While there has been shown and described herein a preferred form of the invention, it is to be understood that the invention is not necessarily confined thereto, and that any change or changes in the structure of and in the relative arrangements of components thereof are contemplated as being within the scope of the invention as defined by the claims appended hereto.

What is claimed is:

1. A measuring sphygmomanometer comprising a rigid casing having a side wall, a manometer secured within the upper part of the casing, said manometer having a movable pointer and a pressure scale exposed through the upper end of the casing, a stethoscope having a flexible tube and a bell connected in communication therewith, said bell being mounted within said casing beneath the manometer and having a downwardly facing open end, an annular compressible applicator air sack secured to the lower end of the casing, said sack having a central opening registered with the open end of the bell, and means providing communication between the sack and the manometer.

2. A measuring sphygmomanometer comprising a flat rigid casing having a side wall, a flat manometer secured within the upper part of the casing, said manometer having a movable pointer and a pressure scale exposed through the upper end of the casing, a stethoscope having a flexible tube and a bell connected in communication therewith, said bell being mounted within said casing beneath the manometer and having a downwardly facing open end, an annular compressible applicator air sack secured to the lower end of the casing, said sack having a central opening registered with the open end of the bell, and means providing communication between the sack and the manometer, a rigid bottom plate secured in the lower part of the casing, said sack having a top wall engaging the underside of the bottom plate, said sack having an external annular assembling bead, and the casing side wall having an internal assembling flange spaced and below the bottom plate behind which the assembling bead is forcibly and removably engaged.

3. A measuring sphygmomanometer comprising a flat rigid casing having a side wall, a flat manometer secured within the upper part of the casing, said manometer having a movable pointer and a pressure scale exposed through the upper end of the casing, a stethoscope having a flexible tube and a bell connected in communication therewith, said bell being mounted within said casing beneath the manometer and having a downwardly facing open end, an annular compressible applicator air sack secured to the lower end of the casing, said sack having a central opening registered with the open end of the bell, and means providing communication between the sack and the manometer, a rigid bottom plate secured in the lower part of the casing, said sack having a top wall engaging the underside of the bottom plate, said sack having an external annular assembling bead, and the casing side wall having an internal assembling flange spaced and below the bottom plate behind which the assembling bead is forcibly and removably engaged, said sack having vertically spaced internal annular assembling beads surrounding its opening, said bottom plate having an opening registered with the stethoscope bell and passing said upper internal bead, the bell having a peripheral portion securably and removably engaged between said upper and lower beads.

4. A measuring sphygmomanometer comprising a flat rigid casing having a side wall, a flat manometer secured within the upper part of the casing, said manometer having a movable pointer and a pressure scale exposed through the upper end of the casing, a stethoscope having a flexible tube and a bell connected in communication therewith, said bell being mounted within said casing beneath the manometer and having a downwardly facing open end, an annular compressible applicator air sack secured to the lower end of the casing, said sack having

a central opening registered with the open end of the bell, and means providing communication between the sack and the manometer, a rigid bottom plate secured in the lower part of the casing, said sack having a top wall engaging the underside of the bottom plate, said sack having an external annular assembling bead, and the casing side wall having an internal assembling flange spaced and below the bottom plate behind which the assembling bead is forcibly and removably engaged, a fixed partition plate extending across the interior of the casing between the manometer and the stethoscope bell, with the manometer resting upon the partition plate and the bell engaged with the underside of the partition plate, said pointer and pressure scale being on the upper end of the manometer, and a glass secured in the casing above the pointer and closing the upper end of the casing.

5. A measuring sphygmomanometer comprising a flat rigid casing having a side wall, a flat manometer secured within the upper part of the casing, said manometer having a movable pointer and a pressure scale exposed through the upper end of the casing, a stethoscope having a flexible tube and a bell connected in communication therewith, said bell being mounted within said casing beneath the manometer and having a downwardly facing open end, an annular compressible applicator air sack secured to the lower end of the casing, said sack having a central opening registered with the open end of the bell, and means providing communication between the sack and the manometer, a rigid bottom plate secured in the lower part of the casing, said sack having a top wall engaging the underside of the bottom plate, said sack having an external annular assembling bead, and the casing side wall having an internal assembling flange spaced and below the bottom plate behind which the assembling bead is forcibly and removably engaged, said sack having vertically spaced internal annular assembling beads surrounding its opening, said bottom plate having an opening registered with the stethoscope bell and passing said upper internal bead, the bell having a peripheral portion securably and removably engaged between said upper and lower beads, said air sack having parallel vertical outer and inner side walls and an arcuate bottom wall joined to the lower ends of the side walls, said side walls and bottom walls being flexible and resilient.

6. A measuring sphygmomanometer comprising a flat rigid casing having a side wall, a flat manometer secured within the upper part of the casing, said manometer having a movable pointer and a pressure scale exposed through the upper end of the casing, a stethoscope having a flexible tube and a bell connected in communication therewith, said bell being mounted within said casing beneath the manometer and having a downwardly facing open end, an annular compressible applicator air sack secured to the lower end of the casing, said sack having a central opening registered with the open end of the bell, and means providing communication between the sack and the manometer, a rigid bottom plate secured in the lower part of the casing, said sack having a top wall engaging the underside of the bottom plate, said sack having an external annular assembling bead, and the casing side wall having an internal assembling flange spaced and below the bottom plate behind which the assembling bead is forcibly and removably engaged, said sack having vertically spaced internal annular assembling beads surrounding its opening, said bottom plate having an opening registered with the stethoscope bell and passing said upper internal bead, the bell having a peripheral portion securably and removably engaged between said upper and lower beads, said air sack having parallel vertical outer and inner side walls and an arcuate bottom wall joined to the lower ends of the side walls, said side walls and said top and bottom walls being flexible and resilient.

7. A measuring sphygmomanometer comprising a flat rigid casing having a side wall, a flat manometer secured

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within the upper part of the casing, said manometer having a movable pointer and a pressure scale exposed through the upper end of the casing, a stethoscope having a flexible tube and a bell connected in communication therewith, said bell being mounted within said casing beneath the manometer and having a downwardly facing open end, an annular compressible applicator air sack secured to the casing at its lower end, said sack having a central opening registered with the open end of the bell, and means providing communication between the sack and the manometer, a rigid bottom plate secured in the lower end of the casing, said sack having a top wall to engage the underside of the bottom plate, said sack having an external annular assembling bead, and the casing side wall having an internal assembling flange on its lower end and below the bottom plate behind which the assembling bead is forcibly and removably

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engaged, said sack having vertically spaced internal annular assembling beads surrounding its opening, said bottom plate having an opening registered with the stethoscope bell and passing said upper internal bead, the bell having a peripheral portions securably and removably engaged between said upper and lower beads, said air sack having parallel vertical outer and inner side walls and an arcuate bottom wall joined to the lower ends of the side walls, said side walls and said top and bottom walls being flexible and resilient.

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UNITED STATES PATENT OFFICE  
CERTIFICATE OF CORRECTION

Patent No. 3,032,030

May 1, 1962

Pum S. Han

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

In the heading to the printed specification, line 4,  
for "Ibanan, Nigeria" read -- Ibadan, Nigeria --.

Signed and sealed this 4th day of September 1962.

(SEAL)

Attest:

ERNEST W. SWIDER  
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DAVID L. LADD  
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